SYNERGY
PUBLISHING PTE. LTD.

Volume 5
Issue 02
October 2021

ISSN 2591-7137(Print) 2591-7145 (Online)

Journal of Finance Research

Editorial Board

Focus and Scope

Journal of Finance Research (JFR) is an international peer review journal publication. The aim of JFR is to be the most reliable sources for research information in the field of business finance all over the world.

The journal expected to deliver high-quality original research papers that are significant in all disciplines of finance research. We encourage paper submissions especially from young researchers and focusing on new research findings and exploring new theories and methods that can be applied in the business financial industry and professional. However, we also seek a contribution that complement in the field of economics development. The subject areas covered by the journal are but not limited to:

- Marketing Management
- Accounting
- Human Resource Management
- Finance
- International Trade
- Business Administration
- Statistics
- Finance and Taxation
- Economics Research
- Public Economy and Management
- International Economic Research
- Financial Research
- Regional Economic Research
- Economic History
- Research on the History of Economic Thinking
- Finance and Accounting Research

Volume 5 · Issue 2 · October 2021

JOURNAL OF FINANCE RESEARCH

Editor-in-Chief

Piotr Raźniak

Pedagogical University of Kraków, Poland

SYNERGY
PUBLISHING PTE. LTD.

Journal of Finance Research
Volume 5 | Issue 2 | October 2021 | Page 1-104

CONTENTS

1 **Financing Decisions Analysis of E-commerce Supply Chain Finance for Fresh Agricultural Products in China**

Ning Xian

6 **The End of Western Economic Growth Theory**

Peixiong Chen

12 **Research on the Impact of Consumers' Purchasing Decision in E-commerce Live-steaming——Based on Cognitive and Perceptive Perspective**

Qianran Xu Jiazhen Wu Menglang Yang Hong Zhu

22 **Decision-making under Market Indeterminacy**

Yun Shi

28 **Analysis of Solvency of A-Share Listed Companies in China's Real Estate Industry**

Hongxia Hu Yuting Wang

34 **An Analysis of the Impact of Dual Crises on Hong Kong's Financial Development**

Keyi Wang

38 **An Empirical Analysis of the Annual Report Effect of High Market Capitalization Companies in China**

Xin Liu Xi Huang Ganya Su

42 **Financial Analysis of MI's Company Based on Harvard Analysis Framework**

Jingxian Guo Yuanxi Yang

46 **Economic Effect of Rural Labor Transfer in China**

Cheng Li Zhixin Zhang Yue Jin

53 **The Impact of the Network Trade Era on the Chinese (Asian) Economy**

Bing Han

56 **A Literature Review of the Influence of Commercial Credit on the Efficiency of Enterprise Capital Allocation**

Xinxiu Xie Tinghua Liu Fengjuan Kou

67 **Investigating the Financial Crisis in 2008 from the Perspective of Banking Systems**

Tonglei Zhang

72 **International Experience and Enlightenment of the Regularization Development of Stall Economy**

Mengni Chen

76 **Comparative Analysis of Chinese Mainland and Hong Kong Insurance Products and the Prospect of Insurance Industry**

Yujin Zhang Jiongjie Liu Caiying Hou

82 **On the "Past and Present" of Hong Kong's Finance**

Boya Zhou Zifei Wang

90 **The Impact of Digital Economy on Total Factor Productivity of China's Service Industry**

Chunyan Liang Zhengyuan Chen

102 **The Research on Total Factor Productivity of Soybean in China**

Yuanchun Chen

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Financing Decisions Analysis of E-commerce Supply Chain Finance for Fresh Agricultural Products in China

Ning Xian*

Decision and Risk Analysis, University of Southampton, Shanghai, 200070, China

ARTICLE INFO

Article history
Received: 19 April 2021
Revised: 26 April 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
E-commerce supply chain finance
SCF solutions
SMEs supply chain financing decision analysis
Supply chain management
Fresh agricultural products

ABSTRACT

The supply chain finance (SCF) solutions are becoming increasingly diversified with the continuous perfection of the economic system. However, financing for small and medium sized enterprises (SMEs) is still a difficult issue waiting to be solved by enterprises and the government in China. SCF solutions based on e-commerce platforms have developed rapidly in China that provide an alternative for SMEs when few studies have been conducted on e-commerce SCF solutions which focus on fresh agricultural products. Therefore, this research focuses on the SCF solutions applicable to e-commerce enterprises of fresh agricultural products.

1. Introduction

Small and medium sized enterprises (SMEs) have long been an important force in the development of the national economy, which provide lots of employment opportunities for society. The financing solutions of SMEs are becoming increasingly diversified with the continuous maturity and perfection of the market economy. These enterprises not only adopt the traditional financing model from commercial banks, but also use other innovative financing solutions. However, financing for SMEs is still a difficult issue in China. According to a survey by the Shanghai Statistics Bureau, only 27.3% of SMEs have access to bank loans when the probability of obtaining financing from other channels is even lower [1].

In recent years, China's e-commerce market has been growing rapidly and it ranked first in the world, followed by the United States, the United Kingdom, Japan, Germany, France, South Korea, Canada, Russia and Brazil [2]. In 2017, online trading volume in China was RMB 7,715 billion, accounting for 19.6% of the total volume [3]. By 2018, the number of users in China's e-commerce industry reached 330 million, with an increase of 46.66% [4]. E-commerce platforms transfer traditional offline retail business to the Internet platforms, effectively decreasing the information asymmetry between buyers and sellers and expanding the transaction scale of e-commerce platforms. Therefore, the supply chain finance (SCF) model based on e-commerce platforms emerged under the joint effect of the financing difficulties of SMEs and the rapid development of the e-commerce market. In the

**Corresponding Author:*
Ning Xian,
Decision and Risk Analysis, University of Southampton, Shanghai, 200070, China;
Email: qixi177@gmail.com

 DOI: http://doi.org/10.26549/jfr.v5i2.6771

e-commerce supply chain finance platforms, participants in the business process can effectively work with large amounts of data and control transactions [2]. Compared to traditional offline financing, it not only reduces the information asymmetry and transaction costs in the financing process, but also accelerates the speed of capital turnover and operational efficiency of the supply chain.

The e-commerce market of fresh agricultural products is in a period of rapid development. Since 2016, fresh agricultural products e-commerce has maintained a high growth rate of over 40% according to the monitoring data of e-commerce Research Center [4]. However, most fresh e-commerce enterprises in the rapid growth of the scale are in a loss-making state [5]. The damage rate of fresh agricultural products is very high due to the characteristics of perishable and not easy to keep fresh. E-commerce companies often bear the financial burden of the damage caused by the destruction of large quantities of agricultural products. Therefore, it is necessary to address the problems related to the e-commerce supply chain of fresh agricultural products. The fresh agricultural products supply chain is the research target in this research.

Supply chain finance based on e-commerce platforms has different financing solutions. The upstream and downstream enterprises in the supply chain have to deal with various risks under different financing solutions such as accounts receivable financing and purchase order financing. Also, some mathematical models such as VaR and CVaR are often used to quantitatively analyze financing strategies and measure risks in e-commerce supply chain finance. Value at risk (VaR) determines the extent of potential losses in an institutional portfolio. It is applied to control risk exposure as the statistic measures the level of financial risk by calculating the maximum loss expected for a given degree of confidence on an investment over a specific time period. Conditional Value at Risk (CVaR) quantifies the amount of tail risk on the portfolio, which is derived by taking an average of the losses beyond the VaR cutoff point.

2. Brief Statement of E-commerce Fresh Agricultural Products SCF

In recent years, with the improvement of people's living standards, consumers increasingly expect products to be fresh and secure. In China, 25% to 35% of fresh products are wasted [6]. In the United States, more than 40% of perishable products are wasted every year [7]. In developed Western economies, grocery retailers lose up to 15% due to perishability [8]. Thus, it is important for retailers to keep products fresh. Fresh agricultural products such as fruit, vegetables and meat are highly perishable, and retailers may be under heavy pressure to prevent fresh products from rotting. In this case, scholars should pay more attention to fresh agricultural products SCF based on e-commerce enterprises so as to reduce the financial pressure and loss for retailers. However, few studies have been conducted on e-commerce SCF which focus on fresh agricultural products. Therefore, this study will focus on the e-commerce of fresh agricultural products SCF.

3. E-commerce SCF Solutions for Fresh Agricultural Products

3.1 Background and Objectives

Small and medium-sized enterprises (SMEs) play a significant role in economic development and have a positive effect on overall growth enterprises, real GDP growth, job creation, and poverty reduction. However, the development of the national economy has been restricted, one of the reasons being the financing difficulties of small and medium-sized enterprises. Many SMEs are not able to obtain investment because of their small scale and low credit rating. Thus, the issue of how to effectively and efficiently finance small-medium-sized enterprises has aroused widespread concern among academia and practitioners. In recent years, supply chain finance (SCF) has been rapidly developed as a new type of financing model in China. At the same time, SCF based on e-commerce has broad prospects; more and more enterprises have begun to adopt online financing, with the rise of internet finance and e-commerce. E-commerce enterprises integrate logistics, information flow, and capital flow, make them more transparent through the development of their own logistics platforms, and thus get involved in the area of e-commerce SCF. With the continuous development of e-commerce supply chain finance, SMEs become more able to obtain the funds through e-commerce platforms. However, the consequences of e-commerce SCF may be negative. Although e-commerce SCF has many merits, such as high efficiency, timeliness, and low cost, there are some new problems in risk management due to more complex virtual network environments and participants. Among the general SCF solutions, the most widely used are accounts receivable financing, purchase order financing, and reverse factoring [9]. SCF solutions can be divided into traditional and innovative financing solutions by certain characteristics. E-commerce SCF solutions, as one of the innovations, are also applicable to traditional SCF solutions.

DOI: http://doi.org/10.26549/jfr.v5i2.6771

3.2 General SCF Solutions in E-commerce Platforms

3.2.1 Accounts receivable financing

In this section, this study focuses on several traditional and e-commerce SCF models. The first is the accounts receivable financing model. As accounts receivable become effective collateral, the financing of accounts receivable is more important in the international market. Accounts receivable are used as collateral for the company to obtain loans [10]. As one of the largest and most liquid assets of an enterprise, they are critical in facilitating business transactions. The accounts receivable financing mode in the supply chain introduces core enterprises that are related to SMEs. SMEs obtain loans from commercial banks by using accounts receivable as a mortgage [11]. Accounts receivable financing in e-commerce SCF is a financial mode in which the upstream enterprises transfer the accounts receivable rights of the downstream enterprises to the e-commerce financial department as a pledge to obtain credit. From the perspective of core enterprise, e-commerce enterprises not only provide loan guarantees for SMEs but also mix the entire supply chain through the flow of funds, benefiting all enterprises in the supply chain. From the perspective of financing enterprises, the accounts receivable financing mode in e-commerce SCF does not need the credit granted by commercial banks to obtain funds, which reduces the financing cost compared with the traditional accounts receivable financing mode. On the other hand, this mode improves the speed of the commodity sales revenue of downstream enterprises, thus speeding up capital turnover.

3.2.2 Purchase order financing

Purchase order financing stems from packaging loans in international trade and extends to the marketing trade chain throughout the supply chain [12]. It is a type of supplier financing in which the bank assesses the chance of the supplier successfully delivering the order, based on the value of the purchase order issued by the reputable buyer, and provides loans to the supplier [13]. The target customers of this model service are the upstream financing enterprises with fast command execution and strong credit. In the purchase order financing model, suppliers are able to use the financing of purchase orders to purchase products; this is helpful in dealing with the problem of capital constraints in upstream enterprises and greatly enhances the ability of suppliers to process funds. Besides, this model greatly shortens the trading cycle and improves the efficiency of the entire supply chain so that the supply chain operation is more stable [14].

3.2.3 Factoring and reverse factoring

In factoring, the company sells its creditworthy accounts receivable at a discount, which is usually equal to interest plus service fees, and obtains immediate cash [15]. Factoring has the following advantages. Firstly, since the credit provided by the lender is strongly related to the value of the supplier's accounts receivable and not to the supplier's overall reputation, factoring enables high-risk suppliers to transfer their credit risk to high-quality buyers [15]. Then, the financial sector does not have a pledge guarantee requirement for financing enterprises, which can obtain funds in advance by selling accounts receivable claims, thus speeding up the turnover of funds. Reverse factoring, as the most popular tool in different supply chain financing strategies initiated by large companies with high quality credit ratings, is a mechanism to alleviate supplier financing problems [16]. In the supply chain based on e-commerce platforms, this model relates to the three-party scheme between the supplier, the buyer, and the institution that provides financing, such as a bank or an e-commerce enterprise. The reverse factoring model can also transfer financial risk from the supplier to the buyer, like the factoring model. In addition, reverse factoring can bring direct benefits to all participants throughout the supply chain [17].

3.2.4 E-commerce SCF solutions for fresh agricultural products

Consumers can directly access fresh agricultural products through e-commerce platforms so as to expand the circulation of fresh agricultural products. The intervention of e-commerce platforms helps fresh agricultural products break the geographical restrictions of tangible markets and balance the agricultural production and market demand in China [18]. In view of this, it is also meaningful to analyze the financing solutions of fresh agricultural product SCF based on e-commerce platforms in China. All four financing models involved in this Section can be applied to fresh agricultural products in e-commerce supply chain finance, and the accounts receivable financing model will be introduced at length. The operation process of accounts receivable financing is as follows:

(1) The upstream enterprise (supplier) in the supply chain signs the procurement contract with the e-commerce enterprise, which stipulates that the supplier shall provide the products to the e-commerce enterprises and the e-commerce enterprises shall pay within the agreed account period after receiving the products.

(2) E-commerce enterprises check and upload accounts

 DOI: http://doi.org/10.26549/jfr.v5i2.6771

payable information on the e-commerce platform, suppliers check accounts online and supplement invoice information, and then they can apply for financing selectively.

(3) Financial institutions (banks) conduct online batch approval and release funds to supplier enterprises, based on their judgment on the authenticity of the transaction and credit rating of borrowing enterprises, then evaluate the value of accounts receivable and register the pledge of accounts receivable.

(4) Suppliers get accounts receivable in advance, and e-commerce enterprises pay back to the bank on the due date.

4. Risk Control of SCF Solutions for Fresh Agricultural Products

4.1 Inventory Financing

The risk in the process of inventory financing is mainly reflected in the realisation risk of collateral when the borrower is unable to repay the principal and interest at maturity. When the collateral is difficult to realize or cannot cover the principal and interest that the borrower should repay after the collateral is realized, the e-commerce supply chain platform may suffer losses. Therefore, the following key points need to be noticed in inventory financing risk control. First, regular review of inventory control and shelf life is required. Second, it is necessary to set the pledge rate and loan interest rate according to the borrower's credit status and the difficulty of the realization of pledges. Third, the inventory value should be updated in real time, according to the changes in the market value of the inventory. The borrower shall be required to replenish the collateral or prepay the loan immediately when the inventory falls in value.

4.2 Purchase Order Financing

Since purchase order financing is carried out in the form of a credit loan, the loan quota is set relatively low. If the loan interest rate is too high, this model will be replaced by other financial products to a certain extent. Borrowers may default if the price of trading products falls sharply in purchase order financing. Therefore, the key points of risk control for purchase order financing are as follows. First, analyze and evaluate the credit qualification of enterprises by collecting all kinds of data information, so as to determine the appropriate loan interest rate. Second, the supply chain finance platform should adjust the deposit ratio if the price of trading drops significantly during the financing period: for example, the deposit rate changes from 20% to 30%.

4.3 Accounts Receivable Financing

The accounts receivable financing model is complicated in SMEs due to the principal-agent relationship between e-commerce enterprises, suppliers, and retailers [19]. So the risks in the financing process also have the characteristics of being dynamic and complex. The retailer may be at risk of default when trading products are subject to large price reductions, which cause the supplier to lose the source of the repayment. Therefore, in the accounts receivable financing model, available data information and industry information should be acknowledged to determine whether retailers can pay their bills on time. In addition, market risks, legal risks, macro system risks, and other risks also exist in the accounts receivable financing model [19].

5. Conclusions

Since few scholars have analyzed the e-commerce SCF solutions of fresh agricultural products and there exist some problems which need to be solved in the financing solutions and risk control, this research conducts qualitative research on financing models and risk control. This study introduces general financing solutions applicable to different types of supply chains and explores the advantages of accounts receivable financing, purchase order financing, factoring, and reverse factoring compared to traditional financing solutions. This study also suggests that accounts receivable financing as a type of representative financing solution can be applied to the fresh agricultural products e-commerce industry. Moreover, the financing progress of accounts receivable financing for e-commerce supply chain is explored.

References

[1] Peng, F., and Bi, X., 2010. Study on the development of e-commerce and SMEs' supply chain financing in China. In 2010 International Conference on E-Business and E-Government, pp. 3435-3438. IEEE.

[2] Lahkani, M., Wang, S., Urbański, M. and Egorova, M., 2020. Sustainable B2B E-Commerce and Blockchain-Based Supply Chain Finance. Sustainability, 12(10), pp.3968.

[3] Chen, X., Liu, C., Li, S., 2019a. The role of supply chain finance in improving the competitive advantage of online retailing enterprises. Electronic Commerce Research and Applications, 33, p.100821.

[4] Fu, L., 2020. Research on S2B2C E-commerce Model of Fresh Agricultural Products in the Field of Social E-commerce. IOP Conference Series: Materials Science and Engineering, 740, p.012155.

[5] Han, D. and Jing, M., 2018. Study on Consumers'

  DOI: http://doi.org/10.26549/jfr.v5i2.6771

Multiple Levels Cognitive Behavior to Purchase Fresh Agricultural Products Online. IOP Conference Series: Earth and Environmental Science, 186, p.012015.

[6] Yang, L., Tang, R. and Chen, K., 2017. Call, put and bidirectional option contracts in agricultural supply chains with sales effort. Applied Mathematical Modelling, 47, pp.1-16.

[7] Chen, J., Dong, M. and Xu, L., 2018. A perishable product shipment consolidation model considering freshness-keeping effort. Transportation Research Part E: Logistics and Transportation Review, 115, pp.56-86.

[8] Ferguson, M., Ketzenberg, M.E., 2006. Information sharing to improve retail product freshness of perishables. Product. Operat. Manage., 15 (1) (2006), pp.57-73.

[9] Marak, Z. R., and Pillai, D., 2018. Factors, outcome, and the solutions of supply chain finance: Review and the future directions. Journal of Risk and Financial Management, 12(1), pp.1-23.

[10] Freixas, X., 1993. Short term credit versus account receivable financing. NBER, pp. 15-31.

[11] Liao, Z, Zhao, X., and Feng, Z., 2015. Analysis on supply chain finance accounts receivable financing mode game. International Conference on Education, Management, Commerce and Society (EMCS-15). Atlantis Press.

[12] Li, Y., 2008. Process-focused risk analysis and management of purchase-order financing under logistic financing innovation. In 2008 4th International Conference on Wireless Communications, Networking and Mobile Computing, pp.1-5. IEEE.

[13] Babich, V. and Kouvelis, P., 2018. Introduction to the Special Issue on Research at the Interface of Finance, Operations, and Risk Management (iFORM): Recent Contributions and Future Directions. Manufacturing & Service Operations Management, 20(1), pp.1-18.

[14] Jiang, L., and Su Y., 2016. Research on Order Financing System Dynamics in the Chain Finance Model. Cross-Cultural Communication, 12(8), pp. 25-30.

[15] Klapper, L., 2006. The role of factoring for financing small and medium enterprises. Journal of Banking & Finance, 30(11), pp.3111-3130.

[16] Lekkakos, S.D., Serrano, A., and Ellinger, A., 2016. Supply chain finance for small and medium sized enterprises: the case of reverse factoring. International Journal of Physical Distribution & Logistics Management.

[17] Lacono, U.D., Reindrop, M., and Dellaert N., 2015. Market adoption of reverse factoring. Market adoption of reverse factoring. International Journal of Physical Distribution & Logistics Management.

[18] Han, D. and Jing, M., 2018. Study on Consumers' Multiple Levels Cognitive Behavior to Purchase Fresh Agricultural Products Online. IOP Conference Series: Earth and Environmental Science, 186, p.012015.

[19] Deng, A. and Du, 2017. Research of Risk Identify of Accounts Receivable Financing Based on System Dynamics. Word Journal of Research and Review, 5(3), pp.43-38.

 DOI: http://doi.org/10.26549/jfr.v5i2.6771

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

The End of Western Economic Growth Theory

Peixiong Chen*

Institute of resources, environment and sustainable development, Jinan, Shandong, China

ARTICLE INFO

Article history
Received: 19 April 2021
Revised: 26 April 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
New economics
Economic growth theory
Utility value
Production and transaction

ABSTRACT

Economics is a science that studies how the economy grows, so the theory of economic growth is the most important theory of economics. In the real market economy society, people achieve the goal of economic growth through two kinds of economic activities: production and transaction. Then a correct economic growth theory must be one that can explain both production and transaction economic activities. Just like Newton's law of universal gravitation in physics, it can explain the motion law of all objects. For a long time, we have been dominated by the western economic growth theory of western mainstream economics. It is not difficult to find that it has a fatal defect, which can only explain production economic activities but not transaction economic activities. So it can't explain the Chinese economy, and it can't explain the western economy. The new economic growth theory proposed in this paper makes up for the defects of western economic growth theory, and it is the terminator of western economic growth theory. This is a revolution of new economics to traditional western economics.

1. Introduction

Economic growth theory is one of the most important theories in economics, which studies how economy grows. Because the significance of economic and social existence or the purpose of people engaged in economic activities is to pursue economic growth and increase wealth, so the theory of economic growth is very important. At present, we are dominated by the western economic growth theory of Western (mainstream) Economics. It has many theories, Professor Zhang Weiying pointed out: "so far, no one theory can make a complete explanation for the phenomenon of economic growth." [1]. Professor Wei Xinghua also pointed out: "There is no consensus in Chinese academic circles on the exact connotation of market allocation of resources" [2]. Nevertheless, we have to admit the fact that in the past 200 years and more than 40 years since the reform and opening up of China, the economic and social growth has never been seen in history. Professor Zhang Weiying said: "the only answer I can provide is that human beings have implemented a new economic system, namely market economy" [3]. This shows that economists have failed to grasp the law of economic growth (otherwise there will not be multiple economic growth theories), while people engaged in economic activities have mastered it (otherwise the economy will not grow at a high speed). This is an irrefutable fact, and this paper attempts to explain this phenomenon.

2. Overview of Economic Growth

To study the law of economic growth, we need to unify some concepts related to economic growth.

**Corresponding Author:*
Peixiong Chen,
Institute of resources, environment and sustainable development, Jinan, Shandong, China;
Email: gzcpx@sina.cn

DOI: http://dx.doi.org/10.26549/jfr.v5i2.6877

2.1 The Contradiction between Economic Growth and Solving scarcity

There is a contradiction in economic society: natural resources are limited while human needs (desires) are unlimited. We call this contradiction scarcity contradiction. When people talk about economic growth, the essence is to talk about how to solve the contradiction of scarcity. People will not engage in economic activities related to non scarce resources, such as producing non scarce sunlight and air. People are engaged in economic activities to solve the problem of scarcity.

In the real market economy society, all countries called market economy are pursuing GDP. After the reform and opening up, China has taken the road of socialist market economy, and GDP is also taken as the measure of economic growth. So GDP is also the concept of economic growth. In this way, we link the following three concepts together: economic growth, solving the contradiction of scarcity and increasing GDP.

2.2 Law of Economic Growth

Regularity generally refers to repeated actions. For example, the sun rises in the east every day, and people are engaged in productive labor every day. These are the laws. Obviously, they are different laws. It is a natural law that the sun rises from the East, while it is an economic law that people engage in productive labor every day. What economists want to study is economic law.

The law of nature is formed by nature, which can not be changed by man, but can only be found and obeyed. For example, Newton discovered the law of universal gravitation. The law in economic society is called economic law. It is set by people. People can change it, but it is not easy to change.

One of the main differences between economic law and natural law is that economic law has a direction, that is, there is an economic goal, and the economic law moves towards the economic goal. But the natural law often does not have the natural goal. In economic society, people pursue economic growth, so we call economic goal or economic growth goal, which corresponds to the law of economic growth.

2.3 Economic Growth Theory

To study economic growth means to study the law of economic growth. The description of the law of economic growth is called economic growth theory. Furthermore, the law of economic growth described by natural language is called economic growth thought, while the law of economic growth described by mathematical language is called economic growth model. Economic growth theory includes economic growth thought and economic growth model.

2.4 Phenomenon of Economic Activities

People know the world from appearance to essence. When we explore the law of economic growth, we should naturally begin with the appearance observed, that is, various economic activities in the economic society, also known as the phenomenon of economic activities. Like Newton in the physical world, he observed that Apple landing is not flying, and finally found the law of universal gravitation. Similarly, what we want to explore is the economic growth theory of economic society similar to the law of universal gravitation. In view of Newton's observation of the phenomena in the physical world, it is very necessary. What we want to observe is the phenomenon of economic activities in the economic society.

Through the above analysis, the economic law is different from the natural law, there is a growth problem, that is, there is an economic growth goal. What we want in the end is the law of economic growth to reach the goal of economic growth. The study of the law of economic growth must begin with the observation of economic activities. Therefore, let's first study "economic growth target" and "economic activity phenomenon". In order to explore the law of economic growth, they are the basis of our economic growth theory.

3. Analysis of Economic Growth Target and Economic Activity Phenomenon

3.1 Economic Growth Target

We already know that the real market economy pursues to solve the contradiction of scarcity or GDP, so solving the contradiction of scarcity or increasing GDP is the goal of economic growth. On this point, western economics also understands in this way. In economics, Samuelson defined economics as "economics studies how a society can use scarce resources to produce valuable goods and distribute them among different individuals" [4]. This proves that western economics also regards solving the contradiction of scarcity as the goal of economic growth. Of course, the economic society of non market economy may not pursue this goal of economic growth. The goal of economic growth is an important concept to study the law of economic growth. Because the goal is wrong, the law of economic growth is bound to go wrong.

3.2 Phenomenon of Economic Activities

We already know that people achieve economic growth

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.6877

goals through economic activities. To study the law of economic growth is actually to study the phenomenon of economic activities and find out the logic behind the phenomenon of economic activities. It's the same logic as Newton's observation of apple and other things to find the law of gravity behind the landing.

It is easy to observe that there are many economic activities in the real market economy society. All activities in pursuit of the goal of economic growth are called economic activities. For example, manufacturing products, trading commodities, scientific and technological research and development, enterprise management, and even learning and looking for jobs can be regarded as economic activities. We may as well classify all economic activities into two categories, production economic activities and transaction economic activities. Every economic activity can be classified into one of these two categories.

With the goal of economic growth and the observed phenomena of production and trade, the following work is to explain the law of economic growth produced by these economic activities.

4. Western Economic Growth Theory

The following is the description of economic growth law in western economics, or the theoretical explanation of economic activity phenomenon in western economics. First of all, it depends on its understanding of economic growth goals.

4.1 Economic Growth Target

The goal of economic growth is the basis of forming the law of economic growth. In a real market economy society, there is only one goal for economic growth, not many. And western economics is just planted on this issue. It does not understand that there is only one economic growth goal in the real market economy, so it puts forward multiple economic growth goals.

We have given Samuelson's definition of economics. In the definition, western economics also takes solving the contradiction of scarcity as the goal of economic growth, but western economics has many goals. For example, the pursuit of "general equilibrium" is mentioned in many western economic theory literature. "Walras' general equilibrium theory states that the price mechanism can realize the optimal allocation of resources in the whole society" [5]. Therefore, general equilibrium is also the economic growth goal of western economics. In the textbooks of Western microeconomics, it studies the goal of profit maximization for producers and utility maximization for consumers [6]. It shows that western economics has set many economic growth goals. Different economic growth goals will inevitably correspond to different laws of economic growth.

4.2 Law of Economic Growth

Leaving aside the multi-objective of western economics, we only study one objective of western economics, which is consistent with the reality of solving the contradiction of scarcity, to analyze the law of economic growth it gives us. It is described by economic growth thought and economic growth model respectively.

4.2.1 Western Economic Growth Thought

The law of economic growth described by natural language is called economic growth thought. The following is the economic growth thought given by western economics.

In Samuelson's macroeconomics, Samuelson said: "in fact, economists who study economic growth have found that the engine of economic growth must be installed on four identical wheels in both rich and poor countries. These four wheels or the elements of economic growth are: human resources, natural resources, capital, technological change and innovation [7]. Thus we can see that western economics adopts the direct observation method to understand the law of economic growth that reaches the goal of economic growth. And these four wheels are basically related to "production", so the western economic growth thought can be expressed as: "increasing the input of production factors and improving the level of productivity can achieve economic growth".

4.2.2 Western Economic Growth Model

The western economic growth model is formed by transforming the economic growth thought described by natural language into mathematical language. The following is the general economic growth model given in Samuelson's textbook [7].

$Q=Af(K,L,R)$

Where Q = output, K is capital, L is labor, R is natural resources, and A is technological progress.f is the production function.

Harold Domar model or Solow model commonly used by western economists is the evolution of this general model. There is no essential difference between western economic growth model and western economic growth thought.

4.3 The Defects of Western Economic Growth Theory

It is easy to find that the defect of western economic

DOI: http://dx.doi.org/10.26549/jfr.v5i2.6877

growth theory is that it only explains the phenomenon of production economic activities, but not the phenomenon of transaction activities. Although Professor Zhang Weiying pointed out the problems of western economic growth theory, he himself failed to get out of the box. In essence, the "Smith-Schumpeter growth model" designed by him is still a model about production, only adding the entrepreneurship that should not be added. The same is true of Professor Lin Yifu's understanding of economic growth in China. "In general, modern economic growth is based on the continuous growth of income level on the basis of the continuous improvement of labor productivity," he said [8].

It is a fact that western economics does not study transaction. It assumes that transaction cost is zero. So much so that Coase failed to bring his transaction cost theory into the analysis of economic theory. He said with regret that western economics is "blackboard economics" [9]. There is no doubt that a perfect economic growth theory, if it can not explain all the phenomena of economic activities, must be defective.

5. New Economic Growth Theory

The theory of new economic growth is based on the theory of new economics put forward in the Book Principles of new economics published by the author in 2019. It aims at the defects of western economic growth theory [10].

5.1 (New) Economic Growth Target

Similarly, we must first address the issue of economic growth targets. The economic growth goal of new economics is consistent with and unique to the real market economy. But the new economics classifies the contradiction of scarcity.

5.1.1 Absolute Scarcity Contradiction

The contradiction of absolute scarcity is the contradiction of scarcity that people usually understand, which means that resources can not meet people's needs, that is, the cake is not big enough. So the way to solve the contradiction of absolute scarcity is to try to make the cake bigger and make the scarce resources meet the needs of people as much as possible.

5.1.2 The Contradiction of Relative Scarcity

In reality, we have observed another situation in which people have different needs for goods. For example, there is a person P_1 who needs goods A but does not need goods B, while another person P_2 needs goods B but does not need goods A. Suppose that there are only two people and two goods in the world, then assign goods A to P_1 and goods B to P_2, then there is no contradiction of relative scarcity. On the contrary, if A is assigned to P_2 and B to P_1, there will be a contradiction of relative scarcity. The ancient Greek economist Xenophon said that the flute is undoubtedly a stone for those who can't play [11]. There must be absolute scarcity contradiction in real economy and society. In theory, it can avoid relative scarcity contradiction. In fact, it can't, which indicates that relative scarcity contradiction must exist. So the solution is to distribute all the goods to the people who need them most.

The two kinds of scarcity contradictions exist objectively. If they are not classified, it shows that the understanding of scarcity contradictions is insufficient. Through the classification, it constructs a new economic growth theory to solve the two kinds of scarcity contradiction.

5.2 New Economic Growth Law

The law of new economic growth includes the law of solving two kinds of contradictions.

5.2.1 The Law of Solving the Contradiction of Absolute Scarcity

Obviously, the western economic growth law corresponds to the economic law of solving the contradiction of absolute scarcity. Therefore, the new economics is the same as the western economics. It is also a theory to explain the phenomenon of productive economic activities.

5.2.2 The Law of Solving the Contradiction of Relative Scarcity

There is no concept of relative scarcity contradiction in western economics, so this part is unique to new economics, which is the most important part to overcome the defects of western economic growth theory.

The meaning of the contradiction of relative scarcity is the unreasonable distribution of products. The solution is to distribute the products reasonably. On the surface, it seems that there are many ways to achieve reasonable distribution. In fact, as long as you accept the two conditions given below, you will find that there is only one method to implement.

When we consider the reasonable distribution of products, we need to consider the following two points. First, the demander puts forward the demand, that is, he "asks" for the products he needs from the society. Otherwise, no one knows what it needs; second, the

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.6877

demander must pay the "price", otherwise he may have made a lot of non-point demands. Admitting the above two points actually means admitting that "reasonable distribution" mechanism is "trading mechanism". "Demand + pay" is a kind of transaction. The demander pays the society for the products he owns and trades back the products he demands from the society. Of course, the usefulness of the products he traded must not be as useful as the products he traded back. And it's exactly the same with the other side. So we get the method to solve the contradiction of relative scarcity, and use the "transaction" method to solve the contradiction of relative scarcity.

5.3 New Economic Growth Theory

The followings are the economic growth theories described in natural language and mathematical language respectively.

5.3.1 New Economic Growth Thought

Using natural language to describe the above new economic growth law constitutes the new economic growth thought: using production mechanism to solve the contradiction of absolute scarcity, using transaction mechanism to solve the contradiction of relative scarcity. In other words, all economic activities related to production are solving the contradiction of absolute scarcity, while all economic activities related to transaction are solving the contradiction of relative scarcity. The thought of new economic growth fully explains the two kinds of economic activities of production and transaction in reality.

5.3.2 New Economic Growth Model

Using mathematical language to describe the law of new economic growth constitutes a new economic growth model, which is actually a transaction mechanism model added to the western economic growth model. We already know that the western economic growth model is:

$Q_1=Af(K,L,R)$

Where Q_1 = output, K is capital, L is labor, R is natural resources, and A is technological progress. f is the production function.

This paper gives a new economic growth model to solve the contradiction of relative scarcity: $Q_2 = Rf(T, C)$.

Where Q_2 is the output, T is the price paid, C is the return received, and f is a function of the transaction. R is the state of man.

Then, the new economic growth model is as follows:

$Q=Q_1+Q_2$.

From this, we can see that economic growth depends on production and trade, and both of them are creating value.

6. The Significance of New Economic Growth Theory

6.1 Replace the Western Economic Growth Theory

For a long time, western economic growth theory has dominated us. Through the analysis of this paper, we can see that the western economic growth theory only explains one kind of economic activity, while the new economic growth theory explains two kinds of economic activities at the same time. So the new economic growth theory is the correct and complete economic growth theory. Undoubtedly, it is a new theory to replace the western economic growth theory, and it is the terminator of the western economic growth theory.

6.2 Correctly Explain China's Economic Development

More than 40 years of reform and opening up, China's rapid economic growth has created a "Chinese miracle". Xia Bin, counsellor of the State Council of China, once pointed out in a long article: "Up to now, the discussion of China's miracle can not be well explained in theory, and it is difficult to reach a consensus due to the disunity of understanding." As Nobel laureate Milton Friedman once said, "those who can interpret China's economic reform should be awarded the Nobel Prize." [12] Their view shows that the western economic growth theory can not explain the Chinese economy, in fact, it can not explain the western countries' economy.

With the new economic growth theory, it is easy to explain the miracle of China's economic growth. The reason is very simple. From the perspective of western economic growth theory (leading economists' thinking), we can see that economic growth depends on "production", and it is difficult to explain the data released by China's National Bureau of statistics by production alone. China's GDP has grown by 33.5 times in 40 years of reform and opening up, with an average annual growth of 9.5% [13]. The new economic growth theory tells us that economic growth depends not only on the "production" mechanism, but also on the "transaction" mechanism. Everyone can personally realize that the biggest change in China after the reform and opening up is trading. If we say that the production has increased several times or more than ten times, the trade has increased dozens or even tens of thousands of times from scratch. Detailed analysis is not carried out here. The new economic growth theory strongly explains how the miracle of China came into being.

DOI: http://dx.doi.org/10.26549/jfr.v5i2.6877

6.3 Guiding Role for China's Economic Growth

Just as Newton's law of gravitation plays an important role in guiding the real society, the theory of economic growth plays a very important role in guiding the real market economy. According to the western economic growth theory, we only know how to rely on production to promote economic growth, investment pull is a way to increase the input of production factors, and we can't see the transaction to promote economic growth. According to the new economic growth theory, trade can promote economic growth, so the country should realize that economic growth can not only rely on production, but also rely on trade. The essence of transaction creating value is to optimize the allocation of resources. In China, there is a serious situation of resources not optimal allocation. As long as we solve the following problems, we can promote the national economic growth. First, the tradable resources that are not allowed to be traded should be allowed to trade. Typically, enterprise property rights and rural land resources are not tradable resources restricted by policies in China.

Second, we should solve the problem of tradable resources that cannot be traded technically as soon as possible. The typical is the resources of scientific and technological achievements. So far, China has not been able to solve the problem of scientific and technological achievements trading, leading to the lag of national science and technology development [14]. Western countries do not have three major resources can not trade, which also shows that this is China's unique economic growth opportunity. When the path of economic growth does not go, it is a kind of begging with a golden rice bowl, which of course needs the support of the new economic growth theory.

7. Concluding Remarks

This paper introduces the theory of new economic growth, which is based on the principle of new economics. The new economic growth theory retains the production part of the western economic growth theory and increases its missing transaction part. This is the reason why the western economic growth theory mentioned by Professor Zhang Weiying can not give a complete explanation for the phenomenon of economic growth. Western economic growth theory is not a wrong theory, but an incomplete theory. It is not that it cannot be explained, but that it can only be explained one sidedly. This makes economists have to use it, but they feel that there is always a problem in using it. Therefore, it is inevitable for the new economic growth theory to replace the western economic growth theory, which is the terminator of the western economic growth theory.

It should be noted that due to the limited space, two important issues related to the new economic growth theory are not involved here. One is the utility value theory, which is the basic theory supporting the new economic growth theory; the other is the analysis of the role of man, who is the main body of creating wealth. The new economic growth theory includes the analysis of the role of human beings, which is omitted in this paper.

References

[1] Zhang Weiying. Principles of Economics [M]. Xi'an: Northwest University Press, 2015:384-409.

[2] Wei Xinghua. Some issues worthy of reflection on the theory and practice of market allocation of resources [J]. Economic Journal, 2015 (1): 7-12.

[3] Zhang Weiying. The logic of market [M]. Xi'an: Northwest University Press, 2015:9-16.

[4] Paul Samuelson, William Nordhaus. Microeconomics (19th edition) [M]. Translated by Xiao Chen. Beijing: People's Posts and Telecommunications Press, 2012:3-5.

[5] Wang Xuemei. A brief history of western economics [M]. Yunnan People's publishing house, 2005:3-9.

[6] Man Kun. Principles of Economics (7th Edition) [M]. Translated by Liang Xiaomin. Peking University Press, 2015.

[7] Paul Samuelson, William Nordhaus. Macroeconomics [M] (19th edition), translated by Xiao Chen. Beijing: People's Posts and Telecommunications Press, 2012:195-210.

[8] Lin Yifu. Developing countries need theoretical innovation from their own practice [J]. Financial circles (Academic Edition). 2017 (35): 11-12.

[9] Wang Hongchang, Lin Shaogong, translated. Lectures of Nobel Prize winners in Economics (1978-2007, Revised Edition) [M], China Social Science Press, 2008:355-370.

[10] Chen peixiong. Principles of new economics [M]. Beijing: China Fortune publishing house, 2019.

[11] Xenophon (ancient Greece), economics, Athens' income. Trans. Zhang Bojian, Lu Danian. Beijing: Commercial Press, 1961.

[12] Xia Bin. "China miracle": an economist's thinking on theoretical innovation [J]. Economic trends, 2019 (3): 3-15.

[13] National Bureau of statistics. China's GDP has increased 33.5 times in 40 years of reform and opening up [n]. Economic daily, August 27, 2018.

[14] Chen peixiong. Economic growth model based on new economic growth theory [J]. Finance and management, 2020 (06): 129-134.

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.6877

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Research on the Impact of Consumers' Purchasing Decision in E-commerce Live-steaming——Based on Cognitive and Perceptive Perspective

Qianran Xu* **Jiazhen Wu** **Menglang Yang** **Hong Zhu**

Jilin University, Changchun, Jilin, 130000, China

ARTICLE INFO

Article history
Received: 21 May 2021
Revised: 28 May 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
E-commerce
Live-steaming
Cognitive perspective
Perceptive perspective

ABSTRACT

In the live-streaming area, high-tech social media has transformed our interactions and social activities through a brand new marketing approach. The research identifies the underlying drivers of purchasing decision from cognitive and perceptive perspective, and confirms the decision-making mechanism from individual view. Our study is based on S-O-R Theory, Social Presence Theory and Technology Acceptance Model, and we add Perceived Trust. A scale of 24 items which reflecting 6 construct was set up. Then a pre-test was designed to test the validity of scale and a formal experience was conducted to 311 customers. Data are analyzed applying the structural equation modelling (SEM) technique with SPSS and Amos. The results indicate that cognition and perception both positively influence Perceived Ease of Use. But only cognition can significantly affect Perceived Use, necessitating expertise of anchors and dissemination of high quality content. Besides, the affecting path of PU, PEOU and PT was verified, providing guidance for platform designing, anchor training and product selecting.

1. Introduction

On the onslaught of global pandemic, live-streaming has boomed quickly. The scale of transactions per unit, the fast-racing penetration rate and the development of technology brought robust motivation. According to the 47th "Statistical Report on China's Internet Development Status", which is released by China Internet Network Information Center (CNNIC), by December 2020, online shopping users has reached 782 million, accounting for 79.1% of the total netizens. Live-streaming has shown a goof momentum of rapid development, shown from the statistics that 66.2% of e-commerce users with live watching experience have purchased products during the process.

However, problems (e.g: data fraud, poor quality of product, mixed anchors) spring up together. Only if relative institutions dig into the essence of psychological need and purchasing decision-making, can the new business model be explored and the next tuyere be discovered. The fantastic shopping course derives on social clues, such as experience sharing, reciprocal recommendation, community building and mutual identification. Therefore, from the individual perspective, it is necessary for institutions to deeply understand the affecting mechanism and then improve in platform, operation model, quality of product and ability of anchor, so that more fans can turn to potential customers.

Thus, the research questions for this study are:

**Corresponding Author:*
Qianran Xu,
Jilin University, Changchun, Jilin, 130000, China;
Email: 469622573@qq.com

DOI: http://doi.org/10.26549/jfr.v5i2.6904

(1) How does the cognitive and perceptive awareness affect one's feeling of perceived usefulness(PU) and perceived ease of use(PEOU)?

(2) How the mutual trust established through virtual website?

(3) What factors have promoted the final purchasing decision?

Our research tends to explore the cognitive and perceptive mechanism of live-streaming, based on Theory of social Presence, Theory of consumer's behavior and Technology Acceptance Model. Then we shall explore the application based on the newest commercial activities.

2. Literature Review

2.1 SOR (Stimulus-Organism-Reflection) Theory

SOR theory, which represents "Stimulus -Organism-Reflection", is a general model used in human behavior. The theory points out that consumers' purchasing behavior is caused by a series of stimuli, which generate consumers' motivation, and then reflect in the purchasing behavior.

Applying SOR model is a continuous procedure. Mehrabian & Russell [1] first proposed the SOR model in terms of psychology, with the relationship between environment and organisms be explored. The organism is cited to cause different responses due to the environment. Donovan & Rossiter [2] first applied this theory to brick and mortar stores. Since then, researchers have found several aspects of factors that can arise consumers' consciousness. The factors are situation factors such as performance, product factors such as appearance, and subjective factors such as emotion. All of them can stimulate consumers and affect their behavior. Eroglu et al. [3] used SOR model in online shopping for the first time. They believe that online environment will have an impact on consumers' attitude. Since then, people have researched that the quality of website and social factors stimulated customers, influencing their purchasing intention.

The original model is enriched and then simplified gradually. Yoon [4] extracted existed research and optimized the model. In SOR model, we can induce website activism as an exogenous variable, and regard consumers' emotion as a mediating effect. Chen & Yao [5] used the model to assess consumers' impulsive purchasing behavior by emphasizing the quality of the website. Liu et al. [6] illustrated social presence as a stimulus to explore the effect on customers' behavior.

Under the SOR model, many scholars focus on the purchasing behavior. Yu & Xu [7] regarded the immersive experience while sending barrages as a form of expression of organism's reaction. Xu et al. (2017) ignited the customer outflow phenomenon in social networks through the theory. It is argued that two stimulating factors, which are e-commerce marketing strategies and consumers' social interaction, led to changes in the perceived value and hedonic value of consumers (Shan et al., 2019) Through this way, the factors will influence consumers on their goals and behavior. Li et al. (2021) combined SOR model with iceberg model. They defined the intermediary variable by SOR model, connecting exogenous stimulus with consumers' purchase intention.

2.2 TAM Model

TAM, first proposed by Davis (1986), has been a leading model in the field of technology acceptance. TAM is based on Self-efficacy theory. Theory of planed behavior and Theory of reform and adoption. etc. Davis summarized the previous studies and concluded that the affecting path was measured by two central factors: PU and PEOU. The perceived usefulness (PU) is marked as the magnitude a user believes that using a particular system will enhance how they do their job. Perceived ease of use (PEOU) measures the magnitude a potential user expects that the target system to reduce unproductive effort (Fred et al., 1989) .

The model has gained numerous popularity, specifically because of the transferability to various contexts (Khan et al., 2021) . The TAM2 model developed by Venkatesh (2008) explored the affecting factors of PU and TAM3 (Bala, 2008) enriched the content of PEOU. Live-streaming, as a new online marketing strategy with sense of interaction and immerse, has satisfied emotional demand of security, conformity and network. Extensive literature has shown that the influence of PU is greater than that of PEOU(Zhang, 2017), especially after sustained usage. Therefore, besides the technical aspect, interpersonal relationship embedded in the process should be emphasized, and thus Perceived trust is induced as specific exogenous latent variables.

2.3 Perceived Trust

In online circumstances, perceived trust indicates the feelings of security and confidence while using digital technology to contented one's intention. According to the signal theory, in the case of information asymmetry between contracting parties, the faction with relative less information would speculate the truth according to displayed signals (Brian L., 2011). Credit source and social cues from exogenous stimuli are among these profound factors. From a cognitive perspective, credit

 DOI: http://doi.org/10.26549/jfr.v5i2.6904

source influences the awareness of the creditworthy and among which, professional degree is considered as the most important factor. Matthew (2001) indicated that the profession of anchor showed a positive relationship with the appraisal of brand extension. Besides, the professional degree of anchor also affects the cognition of customers (Kim & Ahn, 2007). From the perception aspect, social clues were listed as key factors in purchasing decision in the MAIN model (Han & Wu, 2017). Lu et al. (2016) exemplified clues (signals like the number of people interest, share, and final purchasing behavior) and indicated the corresponding feelings (Social Presence) positively affected the Perceived credibility.

2.4 Social Presence

Short et al. (1976) first proposed the definition of social presence. He defined the meaning as 'the degree of significance of the others in the interflow and the consequent significance of the interpersonal relationships.' The term was redefined as 'the degree to which a person is perceived as a real one in intervened communication' by Gunawardena (1997).

As the network created the third space and the meaning extended, social presence is considered as a substitution of the previous form of communication-- face-to-face. It is reinterpreted as the magnitude to which a person feels being connected to others in a virtual team via a mediating technology (Niki, 2003). The term is then introduced to the marketing field as a way to study the making purchasing judgment process Lee & Nass (2005) explored the contention and described it with co-presence and physical-input. Based on the research before, Liu et al. [6] specified the definition of social presence in the live-steaming area: 'When enjoying the living of web influencers, customers can interact and communicate with anchors as if in the real context, therefore the decision and behavior will be influenced'.

E-commerce based on social network functions as networking, payment and shopping and involves a sense of Accompany and interactivity. The shopping experience derives from not only the availability of the platform, but also emotional factors based on the cognitive psychology and social cues such as knowing each other, making meaning, sharing stories, purchasing together. Earlier research has proven social presence is formed from both technical and interpersonal perspective. Russell Haines (2021) studied how user interface affect team loyalty, and proved that the collaboration technology activates the feelings of social presence and activity awareness. From the interpersonal perspective, social rituals are designed to attract attention and connection——customers are guided to explore the interested topic, create the real conversation and share the common feelings (Li et al., 2019).

In analyzing the perception formation process of focus consumer in the sequential dimension, customers capture social cues by designing symbols (such as the interactive function of the platform). And the symbolic design of role identity enables customers to realize the presence of others, which generates a sense of situational social presence. Designs relative to the interactive ceremony, informational interaction and emotional resonance with anchors all produce a sense of communication social presence. Together with value transmission and trust establishment, we feel the sense of co-existence, and finally reaching a deeper level called emotional social presence.

3. Research Model

SEM, as a method integrating the factor analysis, variance analysis, multiple regression, outperforms in the ability to deal with multiple variable when estimating the factor structure and factor relations. High tolerance for measurement error enable SEM to function well in domain of behavior and attitude.

Based on the SOR theory, this article starts with exogenous stimuli from the perspectives of perception and cognition. We select "content quality", "satisfaction degree" and "anchor's image and product consistency" as important factors in perception. And choose "situational presence", "Communication Presence" and "Emotional Presence" as important factors from a cognitive perspective (S). The article follows the role of "perceived usefulness" and "perceived ease of use" in the TAM model, and introduces the "perceived trust" variable (O) to jointly affect the organism's purchase intention (R) in e-commerce live-steaming. The article establishes a model to show influencing factors of consumer purchasing intention in e-commerce live-steaming, as is shown in Figure 1.

4. Relationships and Hypotheses

Unlike traditional shopping methods, online shoppers can only have a perceptive understanding of the product displayed through the screen, which makes the information sent by the anchor very important. Effective information transmission helps buyers receive and process information and generate curiosity on goods. This process enhances consumers to form cognition and increase purchasing willingness. As a result, anchors begin to take advantage of Internet to start live-steaming instead of simply sending images and text. At the same time, in order to increase the popularity and entertainment during live-steaming,

DOI: http://doi.org/10.26549/jfr.v5i2.6904

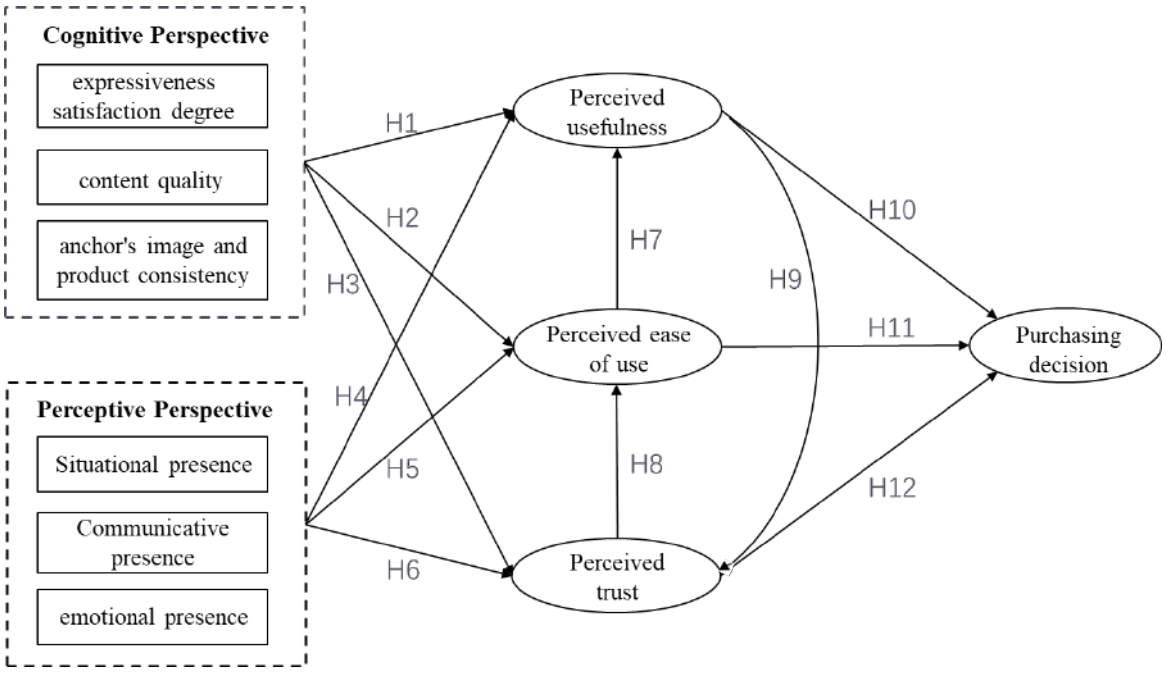

Figure 1. the Impact of Consumers' Purchasing Decision in E-commerce Live-steaming

anchors are good at exposing their personality, combining image and personal talent to match the sort of products. Finally, they become opinion leaders among consumers, guiding their purchasing behaviors. Now from the above, this article uses three factors to influence consumer's perception: content quality, expressiveness satisfaction degree, and anchor's image and product consistency.

Studies have conducted that content quality, which is in the field of cognitive perspective, will positively influence PU and PEOU. Many indications of goods and the description of natural language can be effective in arousing consumers and forming PU (Yu, 2017). Information such as marketing data can be utilized by users to evaluate content sent by anchor, and high quality content leave a subjective impression on customer, and thus promoting the purchase intention (Moon & Kim, 2001). Content information source positively influences the value of perceived practical function, which includes the purchase price, cost of time, and hidden risks (Liu et al., 2020). Therefore, high quality content can improve the consumer's buying experience by reducing consumers 'purchasing concerns.

As for expressiveness satisfaction degree, the degree which anchor precisely describes the product or service can be clearly demonstrated. While watching live-stream, consumers can predict the usefulness of the product with a direct response from the anchor (Zhou et al., 2021). Anchor can satisfy the needs of consumers through talents, speech, testing and other means. These methods will provide customers with a satisfying experience (Liu & Shi, 2020).

Anchor's image and product consistency are also a main factor to influence both PE and PEOU. Anchor can attract consumers by their personalities, and recommends products according to their preferences, which arouses a sense of curiosity and creativity in consumers (Meng et al., 2020). Eleanor et al. (2007) put up that anchor is the thought leader during the live stream, and he can affect customers and influence their judgment on the convenience and satisfaction of product.

Based on the above, we raise the following hypotheses:

Hypothesis 1 (H1) Cognitive perspective positively influences Perceived usefulness.

Hypothesis 2 (H2) Cognitive perspective positively influences the Perceived Ease of use.

Hypothesis 3 (H3) Cognitive perspective positively influences the Perceived trust.

In our research, S-O-R is the starting point and stimuli are classified as cognitive and perceptive perspective. After studying the internal links to trust, cohesion, and the final performance, many literature implicitly assume a positive correlation between social presence and motivation. Therefore, we introduce the term to illustrate the perception (Russell Haines, 2021). The concept of place attachment was first proposed by Williams et al. (1992) and originally described as the connection between people and place through cognition, emotion, and experience. Therefore, we can hypothesis that social presence has a positive correlation with the perceived

 DOI: http://doi.org/10.26549/jfr.v5i2.6904

value. The three dimensions of social presence in the background of virtual online organization (Web page, other people and communication) indicates the three level we study the term. In the technological level, the term is explored and tailored the three level specially for living: co-existence, communicative social presence, and tender social presence. According to the existed research. Lee & Nass (2005) illustrate social presence in 3 level, respectively situational, communicative, and emotional social presence.

Table 1. three dimension of social presence

Category	Definition	Source
Situational social presence	SSP demonstrates the alignment of perception and cognition that customers can realize the existence of others according to virtual surrounding.	Liu Zhilin, Zhang Zhong, Xiao Haijian.(2021)
Communicative social presence	CSP reflects the efficacy of information sharing and social networking,	
Emotional social presence	ESP illustrates the emotional bond between customers and other subjects and the ability to resonate.	Dong et al.(2018)

When consumers have a sense of the virtual community during live-streaming, they have a sense of belonging and make emotional connections to meet their own needs (shopping, social, entertainment and other aspects (Zhou & Chen, 2018). As for situational social presence, a positive correlation between the atmosphere during live steaming and consumer's online shopping experience can be observed. The description of the situation can improve customer's sense of experience, and thus develop perceived trust (Wang et al., 2021). Consumers would create a sense of situational presence through real live steaming scenes, and in this way they will have a higher degree of confidence (Zhou et al., 2021).

In terms of communicative social presence, Li & Ye (2020) put up that interaction positively affects perceived trust. A cozy relationship with the customer and responds to questions in a timely manner lay the foundation for close connection and mutual trust between anchors and customers. If the anchor continuously maintain active interact with consumers, he will create a sense of intimacy, which positively affects the perception of trust (Zhou et al., 2021).

Emotional social presence also matters. In Li & Ye 's (2020) research, accuracy positively affects perceived trust. Once the anchor matches the needs of the customer and describes products comprehensively after trying by himself, customers drive a sense of trust. During the live-steaming, consumers will have a good sense of emotion value through self-service and high-quality information, and satisfy their emotional needs (Zhou et al, 2021).

Based on the above, we raise the following hypotheses:

Hypothesis 4 (H4) Perceptive Perspective positively influences Perceived Usefulness.

Hypothesis 5 (H5) Perceptive Perspective positively influences Perceived ease of use.

Hypothesis 6 (H6) Perceptive Perspective positively influences Perceived trust.

Purchasing intention means the probability of buying a product or service [31]. Consumer perceptions on the usefulness of information and the convenience of e-commerce platforms have a positive impact on purchasing intention (Diao, 2010).

In TAM model, Perceived Usefulness is one main factor to affect purchasing decision. The using effect of product shown by the anchor has a significant impact on the purchase intention (Wang et al., 2021). Only after consumers have a subjective impression of the product, can they match the product with their own needs, and ultimately affect the purchasing decision. Perceived Ease of Usefulness is another factor. Wang et al. (2021) proposed that purchasing convenience and after-sales service on e-commerce platform will affect consumers' willingness to buy. The convenience of purchasing products or services significantly affects consumers' shopping experience. At the same time, if consumers find the product is easy to use during the live-steaming, they are more inclined to buy products (Zhang, 2020).

Consumers 'perceived usefulness of products or services can create a sense of trust, and thus help them to make judgments and choices (Zhou et al., 2021). The effect of perceived trust plays a crucial role in purchasing purpose can be shown by the study of Corbitt & Thanasankit (2003). Li & Ye 's (2020) research further proved it. Customers' trust in the anchor increased step by step. Once customers remain attached to the anchor, they will make decisions according to the guideline (Dennis et al., 2019).

Based on the above, we raise the following hypotheses:

Hypothesis 7 (H7) Perceived ease of use positively influences perceived usefulness.

Hypothesis 8 (H8) Perceived trust positively influences perceived ease of use.

Hypothesis 9 (H9) Perceived usefulness positively influences perceived trust.

Hypothesis 10 (H10) Perceived usefulness positively influences final purchasing decision.

DOI: http://doi.org/10.26549/jfr.v5i2.6904

Hypothesis 11 (H11) Perceived ease of use positively influences final purchasing decision.

Hypothesis 12 (H12) Perceived trust positively influences final purchasing decision.

5. Empirical Analysis

5.1 Overall Statement

The question items are established according to existed scale and then modified in our pre-test. A pre-test was designed to test the validity of scale and a formal experience was conducted to 311 customers (effective rate is 95.4%). In our formal test, data for this study are drawn from questionnaires, and analyzed using SPSS version 20. Then Structural Equation model (SEM) in AMOS version was used to determine the relationship between the variables under the questionnaires. Several profile inquires of the respondents are provided before the statistical analysis of the influential path.

5.2 Data Collection Procedure

A formal and methodical statistical technique is induced in quantitative research. Based on the prior studies, we established questions framework with each latent variables at least 3 observable index describing. Every question is scored from 1 (strongly disagree) to 5 (strongly agree)

Measurement instrument

We summarized and completed 16 factors to form the questionnaire, referring from several existing mature scales in e-commerce field. As shown in Table 2.

Publicly available online survey is the main source of our research. Opposite questions were designed to test the authenticity of the reply. The survey questionnaire forms were distributed to diversified groups so that inherent bias could be better eliminated. After validating the questionnaire, we host personal interview to acquire more insight into the topic.

Table 2. Scale design of questionnaire

dimension	factor		question	source
Cognitive Perspective	expressiveness satisfaction degree	CP1	Anchor can show the details of the product and the function according to the willingness of customers.	Zhou et al. (2020) Shekhar M. & Sharon B (1990)
		CP2	Anchor can provide personalized advice when hosting a live-streaming marketing.	
	content quality	CP3	Anchor boost rich experience in the product he/she promote.	
		CP4	Anchor share living experience and provide practical information while chatting.	
	anchor's image and product consistency	CP5	The image of online anchor is consistent with the product he/she sell.	
		CP6	The field of expertise of the anchor is consistent with the domain of the product.	
Perceptive Perspective	Situational presence	PP1	I can feel the connection with others while watching the live broadcast.	Gunawardena C.N. & Little F.J.(1997)
		PP2	I can feel as if many viewers are around me.	
	Communicative presence	PP3	The anchor responds positively to the questions and topics that viewers pose.	
		PP4	I can feel as if the interaction with the anchor is authentic and genuine.	
	emotional presence	PP5	I can feel the passion from the online interaction.	
		PP6	I feel the anchor understand my demand.	
Perceived usefulness	Functional value	PU1	The product I bought can satisfy my expected demand.	Chen et al.(2020)
	Emotional value	PU2	The live-streaming bring me a sense of pleasure.	
	Social value	PU3	Buying the product that anchor recommended can bring me a sense of social identification.	

 DOI: http://doi.org/10.26549/jfr.v5i2.6904

dimension	factor		question	source
Perceived ease of use	Purchasing convenience	PEOU1	The product recommended by the anchor is convenient to buy.	Wang et al.(2021)
	Using convenience	PEOU2	The product recommended by the anchor is easy to use.	
	Experience satisfaction	PEOU3	I am quite satisfied with the product recommended by the anchor.	
Perceived trust	Trust of anchor	PT1	I believe in the professional competence of anchor in choosing and recommending.	Zhou et al. (2021) Liu & Shi (2020)
	Trust of product	PT2	I believe some false information is contained in the recommendation.	
	Trust of product	PT3	I believe anchor has the first-hand experience and share the authentic feeling.	
Purchasing decision	Consumers' attitude	PD1	Watching the online-streaming helps me to do the final purchasing decision.	Chen et al. (2020) Parasuraman et al.(1996)
		PD2	The recommendation of the anchor can inspire my purchasing desire.	
		PD3	I shall give priority to the product recommended by the anchor when I indeed require.	

5.3 Measurement Model

Exploratory Factor Analysis

We first conducted a Pre-test to check and optimize our questionnaires. Without presupposing our position, we test the loading factors for each construct. Accordingly, some indicators were excluded based on the result of PCF to achieve a better fit to the data. And we finally selected 24 items to illustrate 6 construct. After the modification of our question items, we selected construct with eigenvalue higher than 1. Six constructs emerged in the scree test. The total variance interpretation is demonstrated in the table, with the cumulative variance contribution at 76.248%.

The PCF result of the optimized scale is illustrated as follows: The items with relatively higher loading factors are in the same dimension, proving the construct validity of our scale. To clearly indicate the important items, we only demonstrate the items with higher value.

5.4 Confirmatory Factor Test

In the first stage of our formal experience, we analyzed the quality of the measurement model. A test to the relationship between the constructs and their indicators was conducted. As reliability level of the variables, the Cronbach's (alpha) is listed in the Table 3, representing the uni-dimensionality of constructs, with each value greater than the baseline criterion (0.8), showing that the scale is in great reliability level.

Table 3. Cronbach's (alpha) of index

Variables	Items	Cronbach's (alpha)
Cognitive Perspective	6	0.895
Perceived Perspective	6	0.908
Perceived Usefulness	3	0.918
Perceived Ease of use	3	0.874
Perceived Trust	3	0.895
Purchasing Decision	3	0.902
Overall	24	0.955

Analysis of validity, which aims to test the compatibility of our research objective and data results, is normally conducted through Bartlett and KMO test. Scholars argue that model will be effective only if KMO>0.5, P of Bartlett <0.05. Our test result shows value of KMO st 0.933, proving the validity of our research. The Bartlett test also justify the validity of Principal component analysis.

Therefore, all constructs are retained for confirmatory analysis and all results indicate the instrument's convergent validity. CFA of the initial 24 items measurement model revealed the following indices: CMIN=588.571, CMIN/df=2.462, RMSEA=0.069, NFI=0.901, NNFI=0.929, PGFI=0.684, and CAIC (999.644) is below independence model (2021.938) and

DOI: http://doi.org/10.26549/jfr.v5i2.6904

Saturated model (6084.857). The refinement of indicators and optimization of model have been conducted in pre-test and the indices are acceptable.

5.5 Structural Model

The structural equation modelling is a technique that embodies the observed data through some structural parameters characterized by a theoretical framework. The path coefficient between latent variance demonstrates the difference brought by the fluctuation of a factor. The coefficient of each path is showed in Figure 2, with specific coefficient listed in Table 4.

Modification Indices reflect the potential effect of path modification. The value of our model range from 4.64 to 9.111, smaller than 20, confirming the validity of our model.

6. Analysis and Results

Hypothesis Testing

The model fit was checked for all dependent and independent constructs contained in the theoretical framework. Most hypothesized association are supported. This research confirms that the both Cognitive and tive

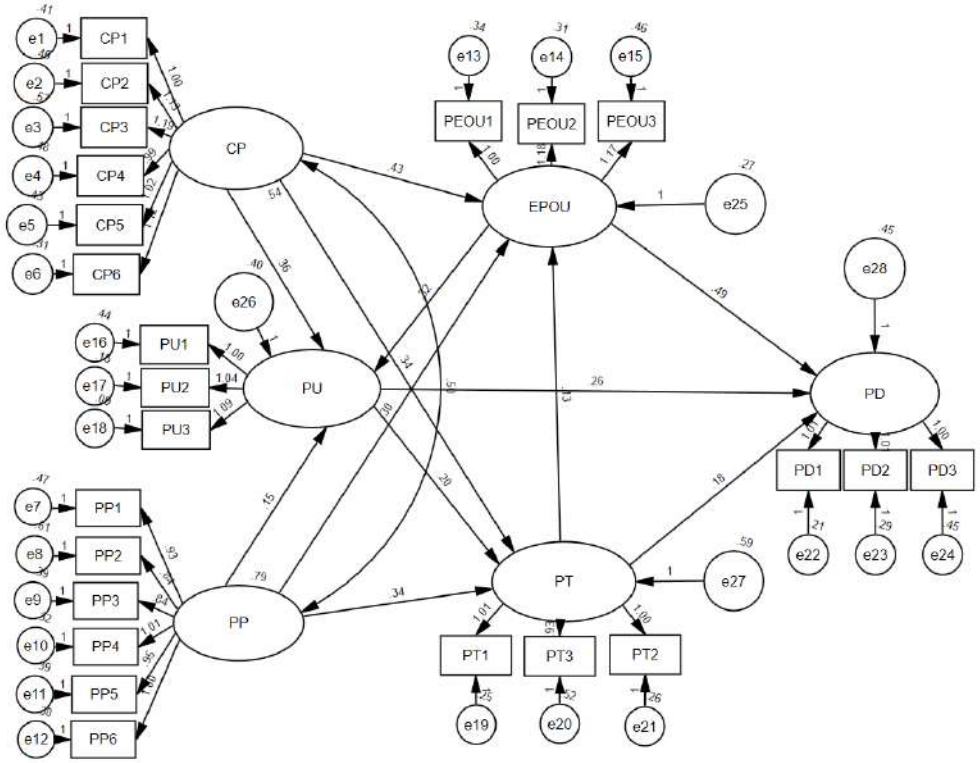

Figure 2. results of SEM

Table 4. Estimate of the structural model

Path			Estimate	S.E.	C.R.	P	Path			Estimate	S.E.	C.R.	P
PEOU	<---	CP	.427	.095	4.492	***	PD	<---	EPOU	.486	.089	5.431	***
PEOU	<---	PP	.302	.077	3.911	***	PD	<---	PT	.181	.062	2.950	.003
PT	<---	CP	.335	.131	2.567	.010	PD	<---	PU	.262	.074	3.542	***
PT	<---	PP	.341	.102	3.338	***	PT	<---	PU	.199	.083	2.405	.016
PU	<---	PP	.149	.086	1.727	.084	PEOU	<---	PT	.127	.052	2.445	.014
PU	<---	CP	.361	.110	3.284	.001	PU	<---	EPOU	.318	.091	3.490	***

 DOI: http://doi.org/10.26549/jfr.v5i2.6904

perspective have significant influence on perceived ease of use ($p<0.001$). Our finding is consistent with previous studies. Therefore, if the customers recognize the dissemination of high quality content, the convince in information collecting may ease their obstacles in accepting new live-streaming platform. And from the perception perspective, the immersive sense and peer connection bring the procedure more pleasure, making it more simple to use.

Both cognition ($p=0.01$) and perception ($p<0.001$) have a positive relationship with perceived trust. When shopping online, a full cognition of the product is the basis for making a purchase decision. The anchor delivers social clues (external image, language, expression, etc.) to help consumers draw an overall impression, generating perceived trust. The effect of perceived perspective on perceived trust is basically in persistent to previous studies. Communicating and purchasing in live-steaming, consumers arise place attachment by the atmosphere created by the anchor, and gain a sense of social identity. After satisfying both material and psychological requirements, trust generates generally.

As for the Perceived usefulness, Cognition is proved to be an essential factor ($p=0.001$). By the contrast, Perception is not significantly relevant to PU ($p=0.084$). This result confirms with our life-experience, the expertise and skills of the anchors and the usefulness of the information are crucial to how customers evaluate the live-streaming. The perception only plays auxiliary role and cannot affect the rational thinking of customers. When passion fades and spending backs to rational, simply creating community atmosphere is no longer attractive to our customers.

Perceived ease of use ($p<0.001$), perceived usefulness ($p<0.001$) and perceived trust ($p=0.003$) are all significant to affect purchasing decision. Product and trust are two main aspects that affect purchasing behavior. When the practicality and convenience of the product are displayed, consumers' emotional resonance will be stimulated, affecting consumers make decisions. The simplification of shopping on e-commerce platforms further facilitate this process. Confidence in the author is an important criterion for customers to judge whether to purchase. On the basis of a certain purchase intention, perceived trust intensify the effect of decision-making.

Extensive literature has shown that the influence of PU is greater than that of PEOU, especially with the periods of the sustained usage. However, in our research, the loading factors of each path is different from the common results. Three factors (the entry point of perception and cognition, the introduction of perceived trust, the uniqueness of live-streaming) may explain the result. First, the research is conducted to evaluate how both perception and cognition affecting the live-streaming and shopping experience. Perceived Trust, as a factor reflecting emotional attachment, may explain affecting mechanism and lessen the direct effect of PU. PEOU includes not only the convenience of the product, but also the expedience of the purchasing process. This process will improve the sense of trust and increase the impact of PEOU. What's more, unlike many other technology, Live-streaming emphasis the emotional connection and the convenience instead of simply the functionality and informational benefit. Therefore, the uniqueness of live-streaming may evoke the difference.

Perceived usefulness affects perceived trust ($p=0.016$), and the results are consistent with Zhou et al. (2021). If the message of product usefulness increases, consumers tend to believe the anchor, so PU positively influence PT. Perceived trust is of significance to perceived ease of use ($p=0.014$). Consumers tend to follow the anchor he trusts and purchase goods, because the anchor implies less risk of transaction. Less risk is potential to enhance the convenience of purchase and the ease of use on products. The impact of perceived ease of use on perceived usefulness ($p<0.001$) conforms to the TAM model. As the purchase process on e-commerce platform is simple, it will transmit useful information signal--consumers are expected to use the product easily, and thereby enhancing the perceived usefulness.

7. Conclusions and Suggestions

Three main concepts matter in the purchasing process: individual, product and scene. E-commerce live-steaming, as a connection of these concepts, reframes the industry. In this research, we find that social clues delivered by the anchor (related to "individual"), and consumers' place attachment (in relation to "scene"), both have a significant impact on purchasing decision. Therefore, this article puts up the following recommendations:

First, from the "individual" perspective, we should improve the effectiveness of conveying social cues. Moving from actively selecting products to passively following the instructions of opinion leader, consumers lose their initiative in the live-streaming. Gradually a sense of dependency on the anchor is cultivated. According to the above, anchors deliver dynamic social cues (expressions, eye-contacts, postures, et al.), establishing the cognitive identity with customers. Through appropriate public persona settings, and suitable products choosing, anchors transmit static social clues (appearance, clothing, et al.), increasing the effect and

DOI: http://doi.org/10.26549/jfr.v5i2.6904

maintaining long-term vitality of live-steaming.

Second, from the "scene" perspective, the consumer's purchasing place attachment should be designed to enhance. The emergence of live-steaming has satisfied the communicating and sharing desire of consumers. Anchors resonate with consumers emotionally through emotional mobilization and signal response. Consumers tend to develop a sense of dependence on live-steaming when they feel a sense of social presence, and thereby promoting their purchasing willingness. Real-time video, emerged as a new form of social media, creates a special environment with interactions including the numeral of likes and gifts, the number of real-time audience and the duration of the live.

References

[1] Mehrabian A., Russell J.A. An approach to environmental psychology. the MIT Press,1974.

[2] Donovan R.J., Rossiter J.R., Marcoolyn G. &Nesdale A. Store atmosphere and purchasing behavior.Journal of Retailing,1994,70(3),283-294.

[3] Eroglu S.A., Machleit K.A., Davis L.M. Atmospheric qualities of online retailing:A conceptual model and implications[J].Journal of Business Research,2001,54(2):177-184.

[4] Yoon E., Effects of website environmental cues on consumers" response outcome behaviors. Master thesis,2012

[5] Chen C.C., YAO J. Y. What drives impulse buying behaviors in a mobile auction? The perspective of the Stimulus-Organism-Response model[J]. Telematics and Informatics,2018,35(5), 1249-1262.

[6] Liu Zhilin, Zhang Zhong, Xiao Haijian. The Influence of Social Presence on Consumers' Purchase Intention in Live Marketing (in Chinese) [J]. Journal of Shanxi Datong University (Natural Science Edition),2021,37(01):55-59+64.

[7] Yu Xin, Xu Zhengliang. Research on the Information Participation Behavior of Barrage Users in Webcast Platforms——Based on the Perspective of Immersion Theory (in Chinese) [J]. Information Science. 2017 (10): 147-151.

 DOI: http://doi.org/10.26549/jfr.v5i2.6904

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Decision-making under Market Indeterminacy

Yun Shi*

School of Business Administration, Northeastern University, Liaoning, Shenyang, 110169, China

ARTICLE INFO

Article history
Received: 21 May 2021
Revised: 28 May 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Decision-making
Market indeterminacy
EMH
Adaptive markets hypothesis

ABSTRACT

The Efficient Markets Hypothesis (EMH) is the focusing topic in the past 50 years of financial market researches. Many empirical studies are then provided that want to test EMH but have no consensus. The perception of EMH determines the attitude and strategy of participants and regulators in financial market. One perception of EMH argues that investors' behavior of seeking abnormal profits and arbitrage drives prices to their ''correct'' value. Investigating the "correct" value derives the concept of "market indeterminacy". It means the inability to determine whether stock prices are efficient or inefficient. Market indeterminacy pervades stock markets because "correct" prices are unknown because of imperfect information and model sensitivity. Market indeterminacy makes arbitrage risky and makes event studies unreliable in some policy and litigation applications. The concept of market efficiency is needed to be re-recognized considering the mechanism of price formation. In order to further research and practice in law and financial market, there needs a view from the "jumping together" of disparate disciplines. Adaptive Markets Hypothesis(AMH) that using the evolutionary principles in financial market is a new viewpoint on cognitive decision and deserves to be paid more attention to.

1. Introduction

The Efficient Markets Hypothesis (EMH) is the focusing topic in the past 50 years of financial market researches. Eugene F. Fama summarized EMH in 1970 that prices fully reflect all available information [1]. The concept of informational efficiency classified on various information sets available to market participants has a deductive meaning that the more efficient the market is, the more random and unpredictable the price fluctuation is. The economic explanation is financial traders try to profit from their information and the profit opportunities are quickly eliminated when investors trade in the market on analyzing their information. Just like the old saying that nobody would leave the money on the table. Rational expectations and market equilibrium become the foundation of modern financial economics.

As a hypothesis, EMH is tested by many empirical studies but have no consensus.

The earlier empirical studies tested whether prices of financial assets do fully reflect various types of information, and several tests (for example, the papers in Cootner, 1964 and Lo1997) have also studied the probabilities of price volatility. But the main critiques of the EMH test revolve around the preferences and behavior of market traders. The expected utility theory with the standard model of investors' preferences considers that investors optimize additive time-separable expected utility functions from certain parametric families, e.g., constant relative risk aversion. However, economists using psychological and experimental theories and methods find a lot of cognitive and behavioral biases

**Corresponding Author:*
Yun Shi,
School of Business Administration, Northeastern University, Liaoning, Shenyang, 110169, China;
Email: historycloud@163.com

DOI: http://doi.org/10.26549/jfr.v5i2.6910

of investors that departure from the original decision-making paradigm under uncertainty [2-5], which include loss aversion (Kahneman and Tversky, 1979; Shefrin and Statman,1985; Odean, 1998), psychological accounting (Tversky and Kahneman, 1981), miscalibration of probabilities (Lichtenstein et al., 1982), overreaction (DeBondt and Thaler, 1986), overconfidence (Fischoand Slovic,1980; Gervais and Odean,2001; Barber and Odean, 2001), regret (Bell, 1982; Clarke et al., 1994), hyperbolic discounting (Laibson, 1997), and herding (Huberman and Regev, 2001). These studies set forth different viewpoints of investors' behavior from the EMH and argue that investors are irrational even if not always. Then there comes the concept of Inefficient market coined by Andrei Shleifer (1999). We seemingly have the way to predict the market behavior according behavioral finance theory.

The supporters of the EMH have responded to the evidences and ideas of behavioral finance and insist that no rules have been found that can always beat the market.

There are also some empirical studies provided by complex researchers. Edgar Peters (1991) put forward the Fractal Market Hypothesis that the securities markets have the character of positive feedback mechanism and nonlinear structure [6]. Zhuang (2001, 2004) analyzed the scaling and fractal structure in Chinese stock market applying autocorrelation index, Hurst index and scaling index on the basis of detrended fluctuation analysis (DFA) algorithm [7]. These studies demonstrate the market price is not random-walking but an evolving process.

Tonis Vaga proposed the Coherent Market Hypothesis (CMH) in his book 'Profiting From Chaos' (1994). The CMH considered the financial markets are complex systems containing investor expectation, government policy, technological and financial innovation, and other factors changing over time, which run as complex dynamic progressions similar to those explained by chaos theory. According to CMH, there are four types of markets emerge during different phases of economic cycle: steady state random walk, unstable transition, chaotic dynamics, or coherent cycles.

A comprehensive thought suggests that the EMH and perspectives supporting market inefficiency are opposite sides of the same coin.

Andrew W. Lo proposed in his articles (2005,2012, 2017,2019) the Adaptive Markets Hypothesis (AMH) that reconciled market efficiency with behavioral alternatives. He extended Herbert Simon's thought of bounded rationality and satisficing principle and analyzed financial markets applying the principles of competition, adaptation, and evolution in financial market dynamics [8-11].

The perception of EMH determines the attitude and strategy of participants and regulator of financial market. But how should we understand the contradiction among so many study results?

When doubting on the EMH, we focus an argument that competition and interaction between investors seeking abnormal profits drives prices to their "correct" value. Look through what is the "correct" value and then we may have a clearer viewpoint.

2. Market Indeterminacy

Through deep investigation of "correct" value, there comes the concept of "market indeterminacy". It means market efficiency is not determined by some certain factors and can not be tested or is changing because financial markets are dynamic evolutionary systems. Till now, we can not verify EMH by accurate evidence and whether successful investments are derived from skill or lucky. Market indeterminacy pervades asset markets, because financial markets are open systems with dissipative structures. So that, we lack reasonably precise models of "fundamental value", or "correct" prices sometime called, against which investors identify the difference between current price and its true value.

2.1 Uncertainty of Intrinsic Value

2.1.1 Valuation Model with Imperfect Information

"Correct" value is often referred to the intrinsic value or fundamental value. Intrinsic value can be derived from dividend discounted model (DDM) (Williams,1938) based on present value theory [12]. In stock valuation, it is

$$\begin{aligned} V_0 &= \frac{D_1 + P_1}{1+r} \\ &= \frac{D_1}{1+\mathrm{r}} + \frac{D_2}{(1+r)^2} + \ldots\ldots + \frac{D_H + P_H}{(1+\mathrm{r})^H} \\ &= \frac{D_1}{1+\mathrm{r}} + \frac{D_2}{(1+\mathrm{r})^2} + \frac{D_3}{(1+\mathrm{r})^3} + \ldots\ldots \end{aligned} \tag{1}$$

Where, V_0 is the intrinsic value at present, D_H is dividend in year H, P_H is the stock price at the end of year H, r is the expected return. Here we find the big problem. Although the model is accurate, there is no accurate solution because we haven't definite input data for the model. Dividend per share and the traded price in the future are unknown at present. The stocks haven't a fixed year to maturity. Even the expected return is changing with investors' sentiment. To solve the problem, there must be some assumptions. For example, let $D_1 = D_2 = \ldots\ldots D_n,\ n \to \infty$, or investment horizon is one year and $P_1 = V_1 = V_0$, then Equation (1) turns to be

$$V_0 = \frac{D_1 + P_1}{1+\mathrm{r}} = \frac{D_1 + V}{1+r}, \quad \text{or}$$

$$V_0 = \frac{D_1}{1+r} + \frac{D_1}{(1+r)^2} + \ldots\ldots + \frac{D_1}{(1+r)^n}, n \to \infty$$

In both cases, there comes

$$V_0 = \frac{D_1}{r} \tag{2}$$

Unfortunately, V_0 has little usefulness though it is a definite value because the assumptions are far from the reality. So the difficulty of applying the valuation model comes from the imperfect information about the future.

Now there is a puzzle in valuation model. It is difficult to make a trade-off between accuracy and applicability.

A reason to use simplified model is fluctuation can be screened by averaging the data. Then, can the valuation model be useful? The answer is no.

2.1.2 Sensitivity of Stock Prices

For more reasonable design, we consider the constant growth Gordon model combining the growth factor. It captures the intuition of more complicated rational stock pricing models that price stocks as the present value of future cash flows. In the model, stock price at time t, $P_{t\text{-}1}$ is given by

$$P_{t\text{-}1} = \frac{D_t}{r - g_{t\text{-}1}} \tag{3}$$

where r is the annual expected rate of return demanded by investors, D_t denotes next year's dividend, g_{t-1} is the annual growth rate of dividends. For simplicity, we assume the expected return is constant. Variables known to investors prior to the event are denoted with a subscript $r-1$ and subsequent to the event by subscript t.

On date t, assume there is news about the growth rate of dividends g, which is the unexpected "event". We will focus on errors in expected returns, not errors in cash flow forecasts, so assume that the market accurately revises its expectations from g_{t-1} to g_t. Let Δg denote this change. The typical "abnormal return", AR, observed on the event day is approximately the percent change in the stock price given by:

$$AR = \frac{P_t}{P_{t-1}} - 1 = \frac{\Delta g}{r - g_t} \tag{4}$$

Now we concern about what if r is wrong? Expected return errors may create very large mispricing effects even when they are "small" that can be seen in Table 1. We fix the growth rate of dividends g_{t-1} at 4% and calculate the resulting percentage errors in price. In the Gordon growth model, the size of these errors depends on the difference $r - g$ in the denominator.

Table 1. Sensitivity of Stock Prices to Errors in Expected Rate of Return

	r	8%	10%	12%	14%
	P_{true}	25.00	16.67	12.5	10.00
Induced error in expected return:	-5%	---	500	167	100
	-4%	---	200	100	67
	-3%	300	100	60	43
	-2%	100	50	33	25
	-1%	33	20	14	11
	0	0	0	0	0
	+1%	-20	-14	-11	-9
	+2%	-33	-25	-20	-17
	+3%	-43	-33	-27	-23
	+4%	-50	-40	-33	-29
	+5%	-56	-45	-38	-33

Errors in expected returns also affect event day abnormal returns. The percentage change in AR with respect to small expected return error is given by:

$$\frac{dAR}{dr} \cdot \frac{1}{AR} = -\frac{\Delta g}{(r - g_t)^2} \cdot \frac{1}{AR} = -\frac{1}{r - g_t}$$

Therefore, if the expected return is incorrect by Δr, the resulting percentage change in the AR is approximately given by

$$\frac{\Delta AR}{AR} = -\left(\frac{1}{r - g_t}\right)\Delta r \tag{5}$$

Like the error in prices, the error in the event-day abnormal return increases in the difference between investors' discount rate and the presumed new growth rate, holding constant the expected return misspecification, Δr.

Here, we simply point out with simulation evidence that undetected inefficiencies can result in prices and price reactions that are incorrect. Prices CAN react "quickly" to news in the short run, but there is no guarantee that the price reaction is a correct or reasonable measure of the true value due to the change in growth rate. If expected returns are incorrect, because of business cycle, then all stocks affected by those expected returns may be mispriced.

Sensitivity of stock prices also manifests the market indeterminacy.

2.2 Market Efficiency Tests Lack Power

Eugene F. Fama (1998) reviewed empirical tests on EMH in his paper "Market efficiency, long-term

DOI: http://doi.org/10.26549/jfr.v5i2.6910

returns, and behavioral finance" and made the following conclusion "Some anomalies do not stand up to out-of-sample replication. The long-term negative post-event returns of dividend-omitting firms also seem sensitive to sample period. The long-term return anomalies are fragile. They tend to disappear with reasonable changes in the way they are measured". Considering the contradiction of different test results, we should not make conclusions in haste upon any of the test, but think over whether the test itself is right. When a test finds the market inefficient, there are two possibilities. One is the market is inefficient and investors are irrationality, the other is the market is right and people have not used suitable model to reflect the reality and make a logical interpretation. This is the paradox on market efficiency test [13]. EMH emphasizes the information efficiency which is different from the allocation efficiency. There is a lot of information besides accounting data that can incorporate in the price. We can not gather all information and incorporate it into an accurate valuation model to test the efficiency. A test using part of the whole information set is definitely inaccurate. On the other hand, the empirical tests lack power because they are from the perspective of looking backward. They use historical data to test the valuation of securities which is in fact determined by the future. This methodology of test is wrong on the earth, especially for stock pricing test. The right way to test ought to use the present value theory based on future data. But the future is unknown. From the valuation model, we see we can not know the""correct value". The price has no target to converge. Thus market efficiency is untestable and indeterminate.

3. Implications

3.1 Market Efficiency is Needed to be Understood Thoroughly

There is a paradox on market efficiency and profit opportunities. Grossman (1976,1980) argues that if markets have perfectly informational efficiency, there is no profit to gather information, in which case there would be little reason to trade and markets would eventually collapse.

From this paradox, we recognize that the concepts of market efficiency and market equilibrium on the basis of price's converging to a "correct" value are static and do not match the market dynamics. An alternative perspective is that the stock market is in an evolution process of value discovery incorporating all available information. In this process, market efficiency can be interpreted that the market is a self-adaptation system. Thus market efficiency can exist concurrently with profit opportunities and market efficiency does not mean random-walking and unpredictable.

3.2 Analysts and Arbitrageurs Face the Risk of Market Indeterminacy

Professors Asquith, Mikhail, and Au study a thousand investment reports written by analysts who were members of the All-America Research Team [14]. This study suggests that analysts have no sophisticated models of their own for fundamental value, but use rule-of-thumb approaches to derive their "target price" when they make the value estimation with financial data. And the analysts often price assets comparing the prices of other assets, namely do pricing on a "relative" basis.

From the valuation model, we can see the intrinsic value can not be accurately calculated and may be changing. Nobody knows the "correct value" at any time. Thus we can understand why analysts use rule-of-thumb approaches. Consequently, it is completely risky to believe that such relative pricing heuristics will drive prices to "correct" absolute levels. Arbitrageurs face the risk of market indeterminacy. The story of Long-Term Capital Management (LTCM) , which is the famous hedge funds collapsed in 1998, is a lesson of ignoring the risk of market indeterminacy.

3.3 It is Hard to Distinguish Fraud Cases on Market Efficiency

Because of market indeterminacy, the change in "fundamental value" at the time of an event can not be measured accurately. So, there is insufficient scientific basis to judge the fraud or manipulation in financial market on the conception of market efficiency. It is still a problem to set up rational criterion for market regulation and policy.

4. Conclusions

There are many implications of market indeterminacy and market efficiency that need to be discussed.

The practical and meaningful question is not that the market is efficient or not, but to evaluate the degree of market efficiency.

The characteristics of investors' behavior are derived from market indeterminacy. Investment decision-making is based on the analysis and judgement of the economic prospect in the future. So it depends on professional skills for economic perception but inevitably faces the risk coming from market indeterminacy. Investors' behavior contains bounded rationality and sentiment because they don't know the price right or not. This feature is just the nature of securities market. Market indeterminacy determines the existence of risk along with returns.

Because models of fundamental value are excessively

 DOI: http://doi.org/10.26549/jfr.v5i2.6910

imprecise, investors spend most of their time using relative (not absolute) valuation measures. Such is the view of Lawrence Henry Summers, former Director of the White House's National Economic Council, writing in the 'Journal of Finance' in 1985. He related the ketchup economics as"They have shown that two quart bottles of ketchup invariably sell for twice as much as one quart bottle of ketchup except for deviations traceable to transactions costs … Indeed, most ketchup economists regard the efficiency of the ketchup market as the best established fact in empirical economics."

While relative valuation is the common rule in economies, financial markets might be highly volatile since a small amount of news for one set of securities may create systematic risk and lead to revisions in stock prices in the whole market. This is the butterfly effect in complex system, where the systematic risk may be very hard to quantify or hedge.

Considering the mechanism of price formation, we should understand that price incorporates not only fundamental information but also investors' perception on the information. Investors' sentiment, optimism or pessimism, also inspires prices greater volatility. George Soros set out his perspective like this with reflexivity theory in his book "The Alchemy of Finance"(1994).

Understanding the mechanism of price formation, market regulation should focus on two aspects. One is to regulate the revelation of fundamental information including information of listed companies, macroeconomic dynamics and government policy. The aim is to guarantee the information reflecting the reality. The other aspect is to constitute and carry out a stabilization policy for securities market just like monetary policy for money market and the whole economy.

For investors' decision-making, it is more important to pay attention to value estimation than price speculation. Price fluctuation is actually unstable because of investors' non-rationality. Investors who keep the idea of long-term value investing in mind and set it up as their belief can earn money. Long-term value investing, although can not outperform price speculation at any time under market indeterminacy, stands on the basis of value creation and sharing in the real economy, and can gain profit and resist the risk eventually, especially avoid involving in a Ponzi scheme or speculation trap which is a castle in the air described by Meynard Keynes.

It will be very useful to remember and respect the following sentences. One is an old chinese saying, "Only when you bear your dream in mind can you possibly realize it and reach your destination". Another is the famous saying by John Meynard Keynes also Warren Buffet, "I would rather be vaguely right than precisely wrong". When market indeterminacy is studied and understood, the sentences above become meaningful.

For theoretical thinking, time arrow is a key factor for investment analysis. Decision-makings based on analysis in the ex ante or ex post are different. So, the differences between uncertainty and risk, possibility and probability, CAPM and DCF model etc, are all needed to be investigated. Strict uncertainty emphasized by Frank Knight in his book "Risk, Uncertainty and Profit"(1921) is corresponding to the environment of market indeterminacy in real economy.

Economics can serve the economy only if economic researches go into the reality and respect the market.

In order to further research and practice in law and financial market, we should get deep known of the mechanism of price formation where investors' behavior plays the central role. So there needs a view from the "jumping together" of disparate disciplines such as psychology, the cognitive neuroscience, economics and finance, even studies on social morality and cultural tradition. Thus, the Adaptive Markets Hypothesis (AMH) is a promising viewpoint on cognitive decision and market dynamics, which deserves to be paid more attention to.

References

[1] Eugene F. Fama, Market Efficiency, Long-term Returns, and Behavioral Finance, Journal of Financial Economics, 1998(49):283-306.

[2] Jay R. Ritter, Behavioral Finance, Pacific-basin Finance Journal, 2003 (11) :429-437.

[3] Andrei Shleifer, Inefficient Markets—an Introduction to Behavioral Finance, Press of RENMIN University of China ,2003:5-23.

[4] Wu Fulong, Zeng Yong, Tang Xiaowo, Herding Theories and Its Realistic Significance to Chinese Stock Market, Forecasting, 2003,22(2):62-68.

[5] Luo Yan, Zeng Yong, Tang Xiaowo, An Overview of Overreaction Theory in Security Market, Forecasting, 2003,22(3):72-75.

[6] Edgar E. Peters, Chaos and Order in the Capital Markets, Press of Economic Science, 1999.

[7] Zhuang Xintian, Huang Xiaoyuan, Sha Yanli, Research on the Fractal Structure in the Chinese Stock Market, Physica A, 2004 (333):293-305.

[8] Andrew W. Lo, Reconciling Efficient Markets with Behavioral Finance: The Adaptive Markets Hypothesis, Journal of Investment Consulting ,Vol. 7, No. 2 (2005): 21-44.

[9] Andrew W. Lo, Adaptive Markets and the New World Order, Financial Analysts Journal, Vol. 68, No.

DOI: http://doi.org/10.26549/jfr.v5i2.6910

2 (2012): 18-29.

[10] Andrew W. Lo, Adaptive Markets: Financial Evolution at the Speed of Thought, Princeton, NJ: Princeton University Press, 2017.

[11] Hasanhodzic, Jasmina, Andrew W. Lo, and Emanuele Viola, What Do Humans Perceive in Asset Returns? Journal of Portfolio Management, Vol. 45, No. 4 (2019): 49-60.

[12] Liu Huangsong, The Theory of the Stock Intrinsic Value and the Bubble of China's Stock Market, Economic Studies, 2005(2):45-53.

[13] Rao Yulei, Liu Dafeng, Behavioral Finance, Press of Shanghai University of Finance and Economics, 2003:24-30 (in Chinese).

[14] Paul Asquith, Michael B. Mikhail, Andrea S. Au, Information Content Of Equity Analyst Reports, Journal of Financial Economics, 2005,75(2): 245-282.

 DOI: http://doi.org/10.26549/jfr.v5i2.6910

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Analysis of Solvency of A-Share Listed Companies in China's Real Estate Industry

Hongxia Hu* **Yuting Wang**

School of Management, Shandong University of Technology, Zibo, Shandong, 255000, China

ARTICLE INFO

Article history
Received: 21 May 2021
Revised: 28 May 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Analysis of solvency
Assets and liabilities
Real estate industry
New financing regulations

ABSTRACT

The real estate industry is a capital-intensive industry and capital has become a particular concern for real estate enterprises. For a long time, China's real estate enterprises rely on high-leverage development and carry out high-debt and high-risk operations. The solvency of real estate enterprises has been the focus of stakeholders' attention. In August 2020, China's regulatory authorities introduced new financing regulations for real estate enterprises. They set up "three red lines," which brought real estate enterprises' solvency into focus once again. This article takes A-share listed companies in China's real estate industry as an example, analyzes and evaluates its debt solvency, and gives suggestions based on new policies and regulations, hoping to provide specific references to the enterpriser's manager and external decision-makers.

1. Introduction

As one of China's economic development pillar industries, the real estate industry's development has crucial significance to China's economic growth. The stability of the real estate industry is always affecting the national economy and people's livelihood. The development of the real estate industry will also be affected by more macro-control adjustment policies. In recent years, the Chinese government has emphasized the policy orientation of "housing not for speculation." It has deployed multiple regulatory measures from various aspects such as finance, taxation, public finance, and supervision to guide the real estate industry's steady and healthy development. In recent years, the Chinese government has emphasized the policy orientation of "housing not for speculation." It has deployed multiple regulatory measures from various aspects such as finance, taxation, public finance, and supervision to guide the real estate industry's steady and healthy development. In August 2020, China's regulatory authorities issued new financing regulations which manage real estate enterprises in the four levels of "red, orange, yellow, green" for real estate enterprises. They also set up "three red lines" (Asset-liability ratio greater than 70% after excluding advances; Net debt ratio greater than 100%; Cash short-debt ratio is less than double) to control the growth of enterprise loans. With the tightening of financing policies in China's real estate industry, the high debt ratio and solvency of real estate enterprises have become the sharp focus once again. Simultaneously, technological innovation, industrial development, scarcity of resources, and macroeconomic uncertainty (such as the novel corona-virus epidemic in 2020) have put the real estate industry under tremendous pressure for survival and development. We must analyze the real estate industry's solvency to

**Corresponding Author:*
Hongxia Hu,
School of Management, Shandong University of Technology, Zibo, Shandong, 255000, China;
Email: hongxiahu1971@sina.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.6997

better respond to complex internal and external situations in this context. This article takes 2010-2019 listed companies in the A-share real estate industry as a research sample. It conducts a descriptive analysis and evaluation of their debt-paying ability, giving suggestions based on new policies and regulations to bring some reference enterpriser's manager and external decision-makers.

2. Contents of Solvency Analysis

Solvency is the ability of an enterprise to repay all kinds of debts. Liability, is refers to the enterprise from past transactions or events which are expected, will lead to the outflow of economic benefits from the enterprise 's current obligations including various loans, bonds, payables and items received in advance etc. The solvency of an enterprise is related to the survival of the enterprise. If an enterprise cannot repay its due debts, it may be taken over by creditors or judged bankrupt by the court. It can be seen that solvency is the basis of other capabilities. And it will directly affect the company's operating capacity, profitability, and development capacity. It is an important issue that enterpriser's manager, investors, and creditors are all concerned about extremely.

Seen from different angles or different analytical purposes, the content of solvency analysis is not the same. Different industries (such as the real estate industry), different scales (such as large enterprises), and different types of enterprises (such as state-owned enterprises) have various methods of business. Besides, the focus of the analysis of debt solvency is also different. The real estate industry is a capital-intensive industry with a long project development period, including project approval, planning and design, site selection and land acquisition, project construction, merchandising, property management, etc. Most of the listed companies in the industry implement vertical integration strategies. The business covers diversified business sectors, integrated service sectors, and real estate finance platforms. According to the length of repayment time, the corporate liabilities involved in different links can be divided into current liabilities and non-current liabilities. The analysis of debt solvency in this article mainly includes short-term solvency analysis and long-term solvency analysis.

3. Analysis of Short-term Solvency

Short-term solvency is also generally called solvency, which reflects an enterprise's ability to repay current liabilities. It is mainly through the realization of existing assets to repay the short-term debt due. Whether an enterprise can repay its short-term debt or not depends on how much short-term debt it has and how much liquid assets it can repay. Therefore, short-term solvency analysis is based on the analysis and comparison of current assets and current liabilities [1].

According to the balance sheet, you can understand the scale of a company's current assets and current liabilities. In general, the larger proportion of existing assets, the more vital liquidity of enterprises. However, whether the internal structure of existing assets is reasonable will also affect its actual solvency. For example, accounts receivable may be hard to pay back, poor customer financial conditions, etc. These causes may lead to a long period for the account, bad debts which cannot be realized. Inventory may have low turnover speed and inferior liquidity due to technology, quality, market, and other reasons. Therefore, the analysis of accounts receivable turnover and inventory turnover is also essential in analyzing enterprise short-term debt solvency. The scale of current liabilities is also an important factor that affects an enterprise's short-term debt solvency. It shows the current debt burden that the company incurred whether the term of payment of various liabilities in current liabilities will have a significant impact on the company's short-term solvency fixedly. At the same time, we also need to pay attention to the internal structure of current liabilities. For example, advance collection items are current liabilities that are repaid with goods or services. Short-term loans, taxes payable, and other items are current liabilities that must be repaid in cash. Different current liability projects have different requirements for the liquidity of assets.

The indicator best reflects the company's short-term solvency based on a comparative analysis of the company's current assets and current liabilities. There are two measurement methods: one is to compare the stock of short-term debt and debt-repayable assets; the other is to compare the cash required for debt repayment and the cash flow generated by operating activities. There are also two calculation methods: absolute index (working capital) and relative index (current ratio, quick ratio, cash ratio, cash flow ratio).

Current assets minus current liabilities are the company's working capital, reflecting its ability to provide cash, repay short-term debts, and maintain normal operations in current and future production and operations. The enterprise-scale limits the absolute number index analysis, so the analysis uses more relative number indicators. The ratio of working capital to current liabilities owned by a company is the current ratio, reflecting the company's existing assets to be used to repay existing assets when the short-term debt is due. When analyzing the current ratio, compare the company's

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.6997

calculated data with the average value of the same industry and the company's historical data. However, this comparison does not explain why the current ratio is high or low usually. It is necessary to analyze current assets and current liabilities, and operational factors to determine the high or low reason. Under normal circumstances, the business cycle accounts receivable and inventory turnover speed are important factors that affect the current ratio. Since the current ratio reflects an enterprise's static status at a certain point in time, it is easy for an enterprise to form a ratio that does not reflect the true operating conditions through some temporary account processing. Therefore, when analyzing the current ratio, we should pay attention to the current assets and current liabilities period before and after business accounting analysis. If the change is large, it should be understood whether the company has carried out "accounting fraud".

In order to eliminate the impact of poor liquidity current assets such as inventories, the quick ratio can partially compensate for the shortcomings of the current ratio indicators. The quick ratio is used to measure the ability of a company's current assets to be realized to repay current liabilities immediately. Quick assets refer to assets that can be realized almost to pay off current liabilities immediately, including monetary funds, trading financial assets, receivables, and so on. Non-quick assets need to wait for an uncertain time to be converted into cash of an uncertain amount, so the short-term debt stock ratio calculated by subtracting non-quick assets from current assets is more credible. When analyzing the quick ratio, it is necessary to notice that the calculation caliber of quick assets may be inconsistent, which affects the comparability and applicability of the indicators. The analysis of the quick ratio should also be carried out in conjunction with the period of the collection of accounts receivable. If the company has low quality of receivables and the seek liquidity, the receivables should be deducted from the quick assets to analyze the cash ratio, that is, the ratio of cash assets (monetary funds, money equivalent, securities) and current liabilities. The cash ratio can accurately reflect the company's direct solvency. However, because the relative idleness of cash assets will reduce the profitability of enterprises, enterprises are not encouraged to retain excessive cash assets.

The debt repayment of an enterprise is a dynamic process, so a dynamic index reflecting the short-term debt repayment ability of the enterprise can be constructed based on the flow data. Cash flow current liabilities ratio is the ratio of cash flow from financing activities to average current liabilities. Cash maturity liabilities ratio is the ratio of cash flow from financing activities to current maturity liabilities. The size of cash flow from financing activities reflects the ability of an enterprise to generate cash during an accounting period. It is the basic source of funds for repaying the company's due debts. At the same time, it is also the operating results of current accounting year which is different from. So when using the flow indicator, it is necessary to consider the factors that affect the cash flow changes of operating activities in the next fiscal year.

4. Analysis of Long-term Solvency

Long-term solvency is the ability of an enterprise to repay non-current liabilities. Because the long measured time and the complex factors involved, it is difficult to make reliable predictions about the future flow of funds. Therefore, the analysis of long-term debt solvency is mainly from the scale and structure of assets, profitability and capital flow. Among them, assets are the ultimate material guarantee for debt repayment, profitability is the guarantee of operating income for debt repayment, and flow of funds is the payment guarantee for debt repayment.

Asset-liability ratio is an important indicator that reflects the solvency of an enterprise. It is the ratio of liabilities to assets, reflecting the degree of guarantee of the repayment of debts by assets and the degree of support of debts to asset funds. Interest-bearing liabilities operation has a financial leverage effect, but the financial risk is high, so operators should maintain an appropriate ratio of liabilities to assets, especially the ratio of debenture with interest. When analyzing the ratio of Asset-liability, we should elimination long-term deferred expenses, deferred income tax which are non-realizable asset items, so as to reflect the company's debt level and solvency more truly. In addition, we should pay attention to the correct classification of liabilities and owner's equity and we also should attention influencing factors such as the contingent debt ratio. Non-financial factors are also content that cannot be ignored in the analysis. Not all liabilities are reflected in the financial statement. For example, the reputation of solvency, unrecorded contingent liabilities, etc. will also affect the solvency of the company, and even have a great impact. We should understand the situation of these aspects in the analysis. The same is a measure of long-term debt solvency. Asset-liability ratio reflects the burden of an enterprise, while the shareholder equity ratio and equity ratio measure the degree of enterprise debt guarantee. The measurement of intangible assets lacks a reliable basis and generally cannot be used as a resource for debt repayment. When analyzing the above indicators, it can be conservatively calculated and deducted accordingly.

DOI: http://dx.doi.org/10.26549/jfr.v5i2.6997

Times interest earned is the ratio between EBIT and interest cost, and it is an indicator of the enterprise's ability to pay interest on borrowings. It should be noted that when the interest expense is negative (the income of interest is greater than the expense of interest), the denominator of this indicator needs to be filtered to exclude the amount of interest income. Cash flow to debt ratio is to compare cash flow with liabilities to evaluate long-term solvency, which is means the extent to which liabilities paid by cash generated from operating activities. Of course, any single index has one-sidedness and limitation, and cannot fully and comprehensively reflect the solvency of the enterprise. In the analysis, the index must be comprehensively evaluated and the off-balance sheet influencing factors must be considered [2].

5. Descriptive Statistical Analysis of Debt Paying Ability of A-Share Listed Companies in Real Estate Industry

According to the China securities regulatory commission's industry classification guidelines, the following is a sample of China's Shanghai and Shenzhen-listed real estate companies (industry code is K70) that is screened annually to form a sample [3]. Table 1 is a descriptive statistical analysis of the annual solvency indicators of the sample companies result. The data come from the states taian database, and the statistical software is Stata13.

Table 1. Descriptive statistics of short-term solvency analysis indicators for the real estate industry from 2010 to 2019

		2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Current ratio	Mean	2.07	2.12	2.19	2.13	2.37	1.95	2.04	2.14	2.01	2.16
	Standard error	1.48	2.03	2.49	1.00	3.37	1.08	1.25	2.57	1.08	1.22
	Minimum	0.64	0.48	0.54	0.25	0.31	0.09	0.03	0.26	0.72	0.08
	Median	1.62	1.63	1.75	1.95	1.86	1.72	1.81	1.66	1.81	1.84
	Maximum	10.20	20.94	28.10	8.30	35.02	6.67	11.41	27.56	9.91	9.57
Quick ratio	Mean	1.02	1.08	1.06	0.89	1.12	0.61	0.73	0.85	0.72	0.74
	Standard error	1.43	2.05	2.53	0.82	3.40	0.63	1.08	2.02	0.89	0.58
	Minimum	0.09	0.06	0.16	0.18	0.08	0.05	0.01	0.08	0.06	0.07
	Median	0.53	0.58	0.63	0.64	0.48	0.41	0.46	0.46	0.45	0.60
	Maximum	9.37	20.73	27.76	6.52	34.88	4.79	11.41	20.56	7.04	3.15
Cash ratio	Mean%	41.50%	50.00%	52.10%	51.40%	58.00%	29.50%	43.40%	49.60%	37.10%	41.40%
	Standard error	66.20%	98.10%	109.40%	61.70%	167.10%	33.90%	98.30%	176.00%	50.60%	41.00%
	Minimum%	0.12%	0.42%	0.89%	6.13%	1.28%	0.60%	0.22%	0.63%	0.21%	0.27%
	Median%	20.90%	23.20%	26.70%	32.60%	24.50%	19.30%	22.20%	21.50%	19.20%	31.10%
	Maximum%	485.60%	744.40%	909.20%	469.60%	1525.00%	183.20%	1079.00%	2040.00%	248.00%	268.50%
the ratio of cash to current debts	Mean	0.04	0.10	-0.04	0.08	-0.03	-0.10	-0.10	-0.01	-0.07	-0.07
	Standard error	0.37	0.60	0.38	0.37	0.57	0.34	0.53	0.32	0.44	0.40
	Minimum	-1.86	-1.71	-2.54	-1.43	-5.94	-2.05	-4.15	-2.05	-3.77	-1.37
	Median	0.04	0.08	-0.01	0.12	0.02	-0.05	-0.04	0.01	-0.05	-0.06
	Maximum	2.28	5.42	1.31	0.78	0.69	0.61	1.28	1.15	1.16	1.39
Business cycle	Mean	1900	1900	2100	2800	2200	2800	2100	2500	2500	2000
	Standard error	2000	2200	5500	12000	3300	8200	3900	5500	4300	3000
	Minimum	3.33	0.74	8.54	12.11	1.73	3.36	11.13	3.43	25.27	16.50
	Median	1500	1400	1300	1100	1400	1400	1400	1600	1700	1300
	Maximum	18000	16000	59000	140000	32000	77000	41000	63000	32000	29000

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.6997

		2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Inventory turnover period	Mean	1900	1800	2100	2800	2300	2900	2200	2500	2400	2000
	Standard error	2000	2200	5600	12000	3300	8300	4000	5600	3900	3000
	Minimum	0.23	0.04	0.32	0.29	8.15	8.45	9.12	10.69	0.17	0.95
	Median	1500	1300	1300	1100	1400	1500	1400	1600	1700	1200
	Maximum	18000	16000	58000	140000	32000	76000	41000	62000	28000	29000
asset-liability ratio	Mean%	63.10%	63.80%	63.70%	63.90%	63.50%	63.00%	62.00%	63.30%	62.80%	68.60%
	Standard error	21.00%	19.80%	19.00%	18.00%	19.30%	19.00%	19.40%	21.30%	18.30%	74.20%
	Minimum%	9.59%	9.13%	8.76%	9.75%	2.82%	15.80%	1.61%	2.51%	10.60%	12.60%
	Median%	68.60%	66.00%	64.90%	66.30%	66.40%	67.40%	66.80%	66.00%	66.00%	65.20%
	Maximum%	94.70%	98.40%	94.00%	95.60%	113.60%	98.80%	92.60%	176.50%	125.20%	864.20%
the ratio of cash to debts	Mean%	2.93%	5.44%	-3.10%	4.81%	1.19%	-7.66%	-6.67%	0.81%	-4.88%	-3.79%
	Standard error	19.70%	28.70%	23.60%	33.80%	18.00%	25.20%	36.50%	18.90%	26.50%	31.10%
	Minimum%	-85.30%	-162.20%	-114.10%	-172.10%	-70.60%	-177.90%	-242.20%	-105.30%	-148.50%	-122.00%
	Median%	2.83%	5.35%	-0.79%	7.20%	1.12%	-3.83%	-2.86%	0.94%	-4.49%	-3.72%
	Maximum%	62.10%	142.10%	71.40%	85.30%	50.80%	44.80%	74.20%	77.50%	110.10%	102.60%
Cash to debt ratio	Mean	4.01	1.96	-12.00	-8.34	1.95	-0.02	1.27	-3.75	-1.00	-4.44
	Standard error	28.35	9.41	150.00	270.00	36.64	13.87	22.20	46.96	14.57	35.38
	Minimum	-57.00	-12.00	-1200.00	-2600.00	-190.00	-53.00	-85.00	-490.00	-76.00	-260.00
	Median	0.20	0.31	0.01	0.88	0.07	-0.26	-0.30	0.10	-0.39	-0.62
	Maximum	240.00	72.77	740.00	770.00	260.00	110.00	190.00	54.04	110.00	120.00
Interest coverage ratio	Mean	12.74	8.53	15.49	12.80	69.70	26.52	24.91	31.06	88.74	11.02
	Standard error	30.82	14.83	42.42	37.07	530.00	96.33	51.94	100.00	640.00	160.00
	Minimum	-9.37	-41.00	-10.00	-140.00	-130.00	-25.00	-9.32	-35.00	-1200.00	-1500.00
	Median	5.98	6.01	6.24	5.38	4.40	5.62	7.60	8.91	9.28	10.64
	Maximum	220.00	110.00	430.00	320.00	5300.00	780.00	340.00	820.00	6400.00	230.00

In terms of short-term solvency indicators, the average current ratio is around 2, and the average speed ratio is on the rise, about 1 in recent years. The short-term solvency of some listed companies is relatively low. The average cash ratio has shown a downward trend in recent years, but they are all greater than the empirical value of 20%, indicating that the company's direct payment ability will not have much problem. But the median and average cash ratio is quite different, indicating that the industry companies vary greatly. The inventory turnover period and the operating cycle are almost the same, indicating that the liquidity of inventory is a key factor affecting the short-term solvency of real estate enterprise. The average value of cash flow and current debt ratio is mostly negative, indicating that the cash generated from operating activities in the current period can not meet its own production and operation activities, nor can it meet the needs of debt repayment. The company must obtain cash increments in other ways or rely on cash or cash equivalents. In order to ensure the timely payment of debts.

In terms of long-term solvency indicators, the average asset-liability ratio is around 63%, the median is greater than the average, and the maximum is close to 100%, which is consistent with the operating characteristics of China's real estate industry with high debt and leverage. According to data from the 2019 annual report of China's listed real estate enterprises, the "three red lines" stepping rate of TOP100 listed company real estate companies released by Crane shows that nearly half of China's top 100 real estate enterprises are within the restricted range. The mean and median of the times interest earned are both greater than 1, indicating that the income from production

DOI: http://dx.doi.org/10.26549/jfr.v5i2.6997

and operation of the enterprise can meet the interest payment needs. The negative value of cash flow debt ratio and cash maturity debt ratio indicate that relying solely on cash flow from operating activities is far from satisfying the need for debt repayment.

In summary, our country's real estate industry has a high asset-liability ratio from 2010 to 2019, which is related to the rapid development of the industry. In the past three decades, China's real estate industry has maintained rapid growth in the context of the government's macro-control policies stimulating domestic demand to promote economic growth and China's urbanization. As a capital-intensive industry, real estate enterprises rely on land dividends and financial dividends to pursue high profits through high leverage and high liabilities expansion. At the same time, many high-indebted companies cannot support the cost of borrowing because of their operating efficiency. They are caught in a vicious circle of borrowing new debts to repay old debts. If the capital structure can not change in time, companies will face bankruptcy. According to statistics disclosed by the Chinese judicial system, after experiencing the impact of the novel coronavirus epidemic in 2020 and years of management and control of " housing not for speculation ", the number of bankrupt real estate enterprises has reached 208 in the first half of 2020. In order to reduce the financial risks of the real estate industry, China's real estate industry's financing regulatory policies have continued to tighten. In 2019, the industry's average asset-liability ratio has dropped to 63.10%, and short-term debt solvency indicators have reached more than empirical values, which means that policy regulation is effective. It reduces the power of blind expansion and diversification of real estate enterprises, and the real estate industry gradually returns to a rational, high-quality and healthy expansion and development path. Marked by the four-level management and "three red lines" financing regulations promulgated in August 2020. China's real estate industry has entered a management dividend stage. The industry should adjust its structure to upgrade the industry and the industry chain, and actively promote the conversion of new and old kinetic energy conversion. Mergers and integrations between enterprises are also conducive to the structural optimization and marketization of the entire industry. For enterprises, "reducing debt" has become a major event for most highly leveraged companies. On the one hand, companies increase cash flow through equity financing, and on the other hand, they reduce debt and optimize debt structure through packaged sales of assets. The differentiation of the real estate industry's competitive landscape has further intensified, which puts higher demands on the management capabilities of operators. Enterprises should invest rationally, focus on the improvement of investment quality and efficiency, accelerate inventory turnover and sales return, rationally optimize asset structure, research and develop advanced technology, and focus on innovation and development [4].

6. Conclusions

This article takes 2010-2019 listed companies in the A-share real estate industry as a research sample, conducts a descriptive analysis and evaluation of their debt paying ability. The study found that real estate industry in China has a high overall debt ratio and high financial risks. And the industry competitive landscape is differentiated, and the development of various companies in the industry is unbalanced. In short-term debt paying ability, the main influencing factor is inventory turnover; the net cash flow generated from operating activities cannot meet the company's debt repayment needs. The real estate industry is extremely sensitive to the funds environment and financing supervision policies. Under the multiple policies of the Chinese government's effective control, the financial risks of the real estate industry have been effectively controlled. Under the background of gradually tightening financing supervision, enterprises should speed up capital withdraw, reduce leverage and debt, and optimize asset and capital structures.

References

[1] Zhang Xianzhi, Chen Youbang Financial Analysis (9thEdition) [M].Dongbei University of Finance and Economics Press,2019.

[2] Xia Wei. Analysis of debt-paying ability of Chnia real estate industry from the perspective of cash fiow [J]. China Forestry Economy, 2020,160(1):135-138.

[3] http://www.sse.com.cn/.

[4] Li Baiji,Li Tiantian.A Research on Asset-light Strategy Mode Implemented by Real Estate Enterprises: A Case Study of Vanke Group [J]. Journal of Guangxi University(Philosophy and Social Science),2018,40(04):48-54.

[5] BEAVER W H.Financial ratios as predictors of failure [J]. Journal of Accounting Research,1966,4(1):71-111.

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.6997

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

An Analysis of the Impact of Dual Crises on Hong Kong's Financial Development

Keyi Wang*

Beijing Forestry University, Beijing, 100083, China

ARTICLE INFO

Article history
Received: 1 June 2021
Revised: 10 June 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Hong Kong
Marginalized
International financial center

ABSTRACT

According to the GFCI ranking from 2018-2020, Hong Kong fell from third to sixth, surpassing cities in other Asian countries and some inland cities in China. Hong Kong's marginalization has intensified because of the impact of the new crown epidemic and anti-repair incidents. However, Hong Kong's marginalization is indeed somewhat inappropriate. As far as the situation is concerned, Hong Kong still has a strong competitiveness, although it is lagging behind, but Hong Kong should think deeply about the strategy and system of "one country, two systems", believe in the country's strategic intention and adjust its state in time to re-exclude the public's understanding of its marginalization.

1. Introduction

According to the Global Financial Center Index (GFCI), the world's leading financial centers ranked London, New York, Hong Kong, Singapore, Tokyo and Shanghai in 2018. However, GFCI in 2020 showed that the order is New York, London, Tokyo, Shanghai, Singapore, Hong Kong and Beijing. In just two years, Hong Kong has lost its position as the world's three major financial centers, and has gradually lost its competitive advantage and strength. We have witnessed Hong Kong's international ranking fall out of the high circle, moving back, which indicates that Hong Kong will gradually be marginalized.

However, in my opinion, it is not accurate to talk about Hong Kong's marginalization at this time, and its marginalization lacks a scope to define where the margin is. What is the first definition of marginalization? Marginalization is to point to the development of people or things in the opposite direction of movement and change. Marginalization is actually a more abstract statement, in short, is non-central, non-mainstream, or by the mainstream (mainstream society, mainstream people, mainstream ideology, mainstream culture, mainstream economy, etc.) excluded, not inclusive. The simple explanation is that from the center and the mainstream is gradually removed to the non-center, non-mainstream.And for Hong Kong, what is central and mainstream relative to its marginalization? It is true that Hong Kong has been lagging behind in recent years because of successive problems, but it is still high, ahead of the vast majority of the world's cities. Hong Kong is definitely in the upper circle, not on the edge. If the scope is divided into the world's three major financial centers, there is no doubt that Hong Kong has been eliminated from this circle and has already exceeded the margin. But if the scope is divided into the top ten financial centers in the world, it can be said that Hong Kong is gradually marginalized. From this point of view, compared with marginalization, what is the so-called center, what is the mainstream, and what has led to the marginalization of Hong Kong in a certain range?

2. The Impact of the Dual Crisis on Hong Kong's Finance

2.1 Section Counter-Examinations

Since June 2019, some Hong Kong reactionaries and radical forces have carried out various radical protests in the name of peaceful marches and rallies. Although the HKSAR Government has repeatedly stated that

**Corresponding Author:*
Keyi Wang,
Beijing Forestry University, Beijing, 100083, China;
Email: 1264164288@qq.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7003

the revision of the Fugitive Offenders Ordinance has been completely discontinued, they continue to use the guise of" counter-examinations" as a pretext for further escalation, escalating violence and increasing social outreach. The march, which began in June, has repeatedly turned violent, and its actions go well beyond peaceful demonstrations [1]. All kinds of strike movement appeared, the major Hong Kong railway hubs were paralyzed, most road traffic was blocked, at the same time, local shops, restaurants and retail in Hong Kong were affected, and even forced to close, leading to the damage of people's livelihood economy.

2.2 New Crown Epidemic

Hong Kong's turmoil not only has an impact on the normal life of the local people, but also makes Hong Kong's economic development into an unprecedented downturn. Hong Kong's economy has fallen sharply since the outbreak of the anti-regime storm, and the subsequent outbreak of the new crown epidemic has hit Hong Kong's finance even more seriously. According to the data, Hong Kong's GDP fell 2.9 percent in the third quarter of 2019, the first negative growth in a decade [2]. Several violent anti-government demonstrations, a series of violent confrontations, and the rapid spread of Internet information, across the country, even the world's travelers, lead to a more serious situation. As a pillar industry in Hong Kong, the development of tourism also entered the cold winter. November 2019, Hong Kong visitors fell 55.9% year on year. Among them the number of mainland tourists fell 58.4 percent. The negative development of tourism has severely hit the retail sector in Hong Kong. Meanwhile, the opening of Hainan duty-free shops has also deprived Hong Kong duty-free shops and the purchasing industry of certain advantages. As a result of a 25.4% year-on-year decline in retail sales in Mainland. It fell 25.3 per cent in November. In 2020, due to the full outbreak of the new crown, Hong Kong's economy has suffered a double blow. In the first quarter of 2020, Hong Kong GDP fell 8.9% year on year, private consumption fell 10.1 per cent, investment declined by 14.3 per cent, and GDP fell by more than 6 per cent in the second quarter [3].

3. "Marginalized" Hong Kong

3.1 Two Aspects

Compared with the top three financial centers in the world, Hong Kong has gradually lost its competitive advantage and position and gradually marginalized. From 2018 to 2020, Hong Kong's ranking in international financial centers fell from third to sixth, surpassing Singapore, Shanghai and Tokyo, and catching up with Beijing in 2018 after Hong Kong in the top 10. Hong Kong's marginalization of these cities can be divided into two aspects.

3.2 From Domestic Point of View

From the domestic point of view, Hong Kong's current advantages and resources in the motherland are gradually divided, Shanghai, Shenzhen, Beijing, Hainan and other places of finance with the support of the Chinese government gradually developed, including Shanghai, Beijing, Shenzhen has entered the world's top ten financial centers [4]. Compared with Hong Kong, Shanghai has the same superior geographical location. Shanghai is located in the Yangtze River Delta economic belt. It has the advantages of natural regional time zone and economic hinterland, which constitutes the centripetal force of becoming a financial center. At the same time, this geographical location is located in the West Bank of the Pacific, facing the North American Free Trade Zone, China's new gathering center —— land transportation, shipping, air transportation center and international trade center and financial center [5]. In Hong Kong, the same superior geographical location, located in the Pearl River Delta, in the Pearl River estuary, has a good transshipment advantage, has a large and superior port, the same shipping and air transport, and Southeast Asian countries can also be closely linked. But Shenzhen also has the same geographical advantage, only Beijing is located inland, so Hong Kong's trade geographical advantage is not unique and irreplaceable. At the same time, Shanghai is the biggest threat to Hong Kong's international financial position. Despite the traditional advantages of the global financial market, Shanghai ranks the ranking of second only to the New York, London, Hong Kong, Singapore and other old asset management centers in the latest 29th index report, with its obvious advantages. Moreover, another highlight of Shanghai 's greatest financial potential is financial technology. In the 28th index, Shanghai ranks third in the field of financial technology, while the 29th issue is more advanced, second only to New York. Shanghai' s ability to allocate global resources is increasing, and an excellent global asset management center is taking shape. As for Shenzhen, its special geographical location, special opportunities and special opportunities have created Shenzhen's financial development almost simultaneously with manufacturing and commerce. Shenzhen back to Hong Kong, which makes many Hong Kong financial business has its radiation effect, and gradually with the development of the financial industry in part of Hong Kong, and Shenzhen less restrictions than Hong Kong, and more countries and inland enterprise support, and have more land and opportunities to let new foreign enterprises, these absolute advantages are not many

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7003

financial centers, which make Shenzhen develop rapidly in such a short time. Compared with these cities, especially Shanghai, Hong Kong, on the one hand, is in a relatively deformed historical fact compared with the prosperity of the inland, relying on the closed and poor cities of Mainland year. More than a hundred years ago, Hong Kong became a British colony, first exposed to industrial civilization and assumed the function of British trade transit to China, thus enabling Hong Kong to develop rapidly from a small fishing village to a trading port, but even then Hong Kong failed to surpass Shanghai. But until China's relationship with the Soviet Union grew colder, and China's access to resources from the Soviet Union became narrower, but this development of socialism still required access to resources and technology like the West, so Hong Kong became a good medium and the only bridge between China and the West. At that time, Hong Kong, backed by a huge market like Chinese mainland, reached out to the world and became an Asia-Pacific and even an international financial center, which explained why other cities in Asia, such as Singapore, could not surpass Hong Kong as an Asian financial center, Its other conditions are no less than Hong Kong, but lack the support of a huge market like China. However, over time, the reason for Hong Kong's prosperity has also become the reason why Hong Kong was gradually overtaken by mainland cities. At that time, Hong Kong's rise was caused by the inconvenience of China's foreign exchange and trade. This was a temporary situation. Over time, the inconvenience gradually disappeared and the Chinese market became more open, which made Hong Kong no longer the only foreign window of China. China's market was gradually divided by several other cities and the rampant independence of Hong Kong. This led to the continuous deterioration of Hong Kong's social situation, which far exceeded the inherent scope and bottom line of "one country, two systems ". It is clearly not a good decision for China to spend all its resources on Hong Kong. As a result, without China's power support, Hong Kong's gradual transcendence in Mainland region is only the result of time.

3.3 From International Point of View

At the international level, although New York, London and Hong Kong were once known as the three largest financial centers in the world, there is still a certain gap between Hong Kong and New York and London in terms of real strength. Whether it is international financial resource allocation capacity or the scope of financial services, there is still a barrier to the depth, breadth and quality of global financial markets [6]. This is not just against Hong Kong, New York and London and other international financial centers other than themselves, so it is beyond doubt that Hong Kong can be ranked third and disguised first. Moreover, in recent years, the focus of the global economy has shown an important feature of a tilt to emerging economies. Their contribution to world economic development has been steadily improved and has become an important force in promoting world economic development. Judging from the basic logic of the change of global economic and financial centers, the growth of economic strength usually requires a matching financial strength, and financial technology will become an important driving force of the pattern change. The development of financial technology affects the connotation and form of the future international financial center. According to the Global Financial Technology Centre Alliance, London, Singapore, New York, Shanghai and Tokyo are also at the forefront in global financial technology development, while Hong Kong lags slightly behind its financial technology level compared with these countries [7]. Therefore, I think the international marginalization is still a difficult reason for Hong Kong's own development. Hong Kong's loss of full support from the Chinese market, coupled with other factors such as counter-examinations and the new crown epidemic, has overtaken Tokyo with Japan's equally non-China market economy and resources. Geography is also lost but is overtaken by Singapore, which has been suppressed for years without a strong market like China.

4. "Not Marginalized" Hong Kong

From 2018 to 2020, it is true that Hong Kong did break away from the high circle of competition during this period, seemingly "marginalized" by the high circle of Hong Kong. In fact, the data are still extremely considerable, still far behind other financial centers, never marginalized. At the same time, according to the latest 2021 international financial center ranking, Hong Kong returned to fourth place, Shanghai is still squeezed into the top three, although Shanghai still squeezed Hong Kong out of the top three. But from the overall score, Hong Kong is only one point behind Shanghai, so Hong Kong's strength is still not to be underestimated. There is still a strong recovery and competitiveness.

Only a year later will Hong Kong recover from the riots and the new crown epidemic less than a year later, and its financial markets will show strong resilience and resilience, not only maintaining the stability of the financial system. And continue to play the role of international financial center market financing.

First of all, according to Hong Kong's own conditions, one country, two systems give Hong Kong an excellent intermediary identity. It is difficult to find any system like Hong Kong that can accommodate two systems as a meeting

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7003

point and buffer zone for Chinese and Western capital.

At the same time, it is impossible for Hong Kong to build one of the world's top international financial centers for so many years without a certain historical precipitation and reserve force. At the same time, the cost of building one of the world's top international financial centers is absolutely not low. These costs are not only reflected in the precipitation of time, but also in a series of legal systems, stock market system, foreign exchange control, tax system, resource allocation, customer source, capital investment and so on, which are difficult to estimate, and Hong Kong has experienced so many years of practice, also created their own unique financial system, image, similar to the historical heritage of the rich family, even if the impact, its status can not be shaken by the latecomers.

Hong Kong has survived successive crises in history. The resilience of its financial markets is unquestionable. Whether in the Asian financial crisis or otherwise, Hong Kong can survive without danger. As you can see, Hong Kong's financial markets as a whole are stable and orderly, the sub-markets run steadily, and market elasticity and toughness are more prominent. So in response to recent crises, Hong Kong in 2020 took a series of measures to deal with it. In the money market, Hong Kong as a whole maintains a low interest rate environment in 2020, making the short-term interest rate run low, more liquid. The overnight interbank lending rate for Hong Kong dollars fell further to 0.04 per cent at the end of the year. On the exchange market, the Hong Kong exchange rate linkage mechanism operates in an orderly manner, making the Hong Kong dollar as a whole stable. The Hong Kong dollar has remained close to HK $7.75 per dollar in 2020, and many times trigger a strong exchange guarantee. The Hong Kong dollar's exchange rate is not only stable but also stronger for the dollar. From April to the end of 2020, there is a net inflow of more than $50 billion into the Hong Kong dollar system. Then, in the capital markets, the Hang Seng index fell 3.4% in 2020. But, in the course of Sino-US trade frictions, the impact of the epidemic and the interference of Western forces, Hong Kong's capital market as a whole remained stable and showed strong resilience. Hong Kong's stock exchange raised HK $394.246 billion in the IPO market in 2020, up 26% from 2019, a little less than NASDAQ, second in the world [8].

From this point of view, Hong Kong's own strength is still very strong, compared with last year's slightly disadvantaged and shown to be "marginalized ", after a short-term recovery, Hong Kong's finance can quickly restore prosperity, not marginalized. So Hong Kong's competitive advantage is still very obvious, marginalization, a little exaggerated.

5. Conclusions

For Hong Kong, "marginalization" is unreasonable in general, and Hong Kong's marginalization should be limited in scope. But even if Hong Kong is temporarily at a slight disadvantage in the high-level competition in international financial centers, especially under the influence of the new crown epidemic and anti-regime events, Hong Kong's economy is indeed traumatized, but at the same time, Hong Kong's financial heritage maintained for many years is irreplaceable and short-lived. Even if Hong Kong's rise is partly due to historical helplessness, history has made Hong Kong unique in the world.

In the process of reform and opening up in the new era, Hong Kong has a special position and unique advantages, and plays an irreplaceable role. Hong Kong should think deeply about the strategy and system of "one country, two systems ", believe in the strategic intention of the country and adjust its mentality in time, and have a positive attitude towards the evaluation and prospect of "one country, two systems ". Hong Kong and the mainland should face the problems in the reform of the new era, define its own position and understand the rational decision of the country, and the sense of crisis can help Hong Kong to carry out the correct transformation strategy to some extent.

References

[1] Daniel Vukovick. The Media Tide Behind the Noise and Fury —— Revelation of Hong Kong's Anti-examinations in 2019 Economic Guide 2020(07):63-67.

[2] Ji Shuo-ming. A technical recession [N] The development of Hong Kong First Financial Daily ,2019-11-14(A11).

[3] Ma Li, Guo Baili. Hong Kong's Financial Market Outlook [J] under the Dual Crisis Enterprise Reform and Management 2021(01):99-100.

[4] Global Financial Centre Index Report: China's Top Ten Financial Centres. 4 Chief accountant, China ,2021(03):16.

[5] Wang Ruijiao. A Study on the Construction of China's Financial Center Based on. Geography Northern Economic and Trade Section 2021(03):119-121.

[6] Wang Xiaoya. From the International Financial Centre to the Global Financial Centre [J]; and China Finance ,2021(02):67-69.

[7] Zong Liang, Chang Yunheng, Liu Jin Han. Prospect of Change in the Pattern of International Financial Center [J].China Finance, 2021 (01): 84 - 86.

[8] Zheng Liansheng. Flexibility [N] in Hong Kong Financial Market Economic Daily ,2021-03-28(010).

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7003

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

An Empirical Analysis of the Annual Report Effect of High Market Capitalization Companies in China

Xin Liu Xi Huang Ganya Su*

School of Statistics, Chengdu University of Information Technology, Chengdu, Sichuan, 610103, China

ARTICLE INFO

Article history
Received: 1 June 2021
Revised: 10 June 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Event research method
Python
High cap companies
Annual report release

ABSTRACT

In this paper, we study the abnormal stock price returns of the top 10 stocks in the Chinese stock market in terms of total market capitalization before and after the release of their annual reports in the past 10 years, using the event study method implemented by the Event Study package of the Alpha Library under Python, using a market model to estimate normal returns. The results find that and most of the events have insider phenomenon.

1. Introduction

In the field of asset pricing, the occurrence of news events, especially about a company's business situation, and what kind of impact it has on the stock price has been a hot issue. With the rapid development of the Internet, investors are able to capture and process information accurately and without any framing bias amidst the flood of information. Extracting valid information from historical annual report events helps investors weigh the impact of news events on stock prices, form comprehensive judgments about the stock market, and make effective decisions. It also provides listed companies with a new perspective to measure the degree of impact of annual report events on stock prices, which in turn can effectively avoid losses caused by herding effects triggered by overheated market sentiment. In the context of accelerated dissemination of events and complex communication paths, the public opinion environment also tends to be complex. Listed companies are facing unprecedented challenges in terms of facing the public, investors, and other aspects such as brand image and reputation.

2. Annual Report Effect

The so-called "annual report effect" is generally found in the mass media and usually refers to the phenomenon that stock prices follow the accounting surplus information contained in annual reports of listed companies (hereinafter referred to as "annual reports") as they are released [1]. Traditional financial theory suggests that irrational investors cannot cause abnormal rates of return because irrational behavior is a stochastic

**Corresponding Author:*
Ganya Su,
School of Statistics, Chengdu University of Information Technology, Chengdu, Sichuan, 610103, China;
Email: 2881538365@qq.com

DOI: http://doi.org/10.26549/jfr.v5i2.7177

behavior. If there is a correlation between the irrational behavior of irrational investors, it can cause a bias in the price system. This is when rational traders can drive prices back to normal levels through arbitrage trading [2]. Behavioral finance understands continuous prices in terms of overreaction. After a long period of price momentum, investors tend to classify stocks with good past performance as winners and stocks with poor past performance as losers, and thus become overly optimistic (pessimistic) about the future performance of good news (bad news) stocks after a series of good (bad) news of increasing (decreasing) surpluses, leading to abnormal stock prices with abnormal returns [3].

3. Empirical Analysis

3.1 Identification of Research Subjects

Companies whose total stock market capitalization accounts for 1% or more of the total market capitalization of the entire market are considered to be high market capitalization companies. According to the data of Shanghai Stock Exchange, the top ten listed companies in terms of total market value on the main board as of May 22, 2021 are shown in Table 1 below, and the percentage of total market value of the main board accounted for by the ten companies totals 23.83%. The variable names are recorded in order as MT, GSYH, ZSYH, NYYH, ZGSY, ZGPA, ZGRS, ZGYH, ZGZM, and HTWY.

Due to incomplete domestic factor data, the estimated normal return model uses market model with the window period set from 5 days before to 10 days after the annual report announcement date. The daily return data of ten stocks from January 1, 2000 to March 10, 2021 and the corresponding daily return data of the SSE Composite Index (00001) are downloaded from the Guotaian database, and the variable name of the SSE Composite Index is recorded as SZ, which is organized and saved as a CSV file.

Table 1. Main Board Total Market Capitalization Ranking

Rank	Stock	TMC(million yuan)	Percentage of TMC
1	600519	256528152.74	5.99%
2	601398	139389513.88	3.25%
3	600036	111623218.31	2.61%
4	601288	103435124.29	2.42%
5	601857	75941454.50	1.77%
6	601318	75882814.81	1.77%
7	601628	71653766.73	1.67%
8	601988	69131088.87	1.61%
9	601888	62088722.30	1.45%
10	603288	55433289.82	1.29%

3.2 Determination of the Date of Occurrence of the Event

Due to the differences in the timing of the listing of the ten companies and the release of their annual reports, the event that Haitian Flavor released its annual report on March 25, 2014 was excluded under the condition that the length of the common minimum estimation period (observed as 170 days) must be met. Specifically, because the time between Haitian Flavor's first IPO and the first release of its annual report is too short to set an estimation period. By 2021, Haitian Flavor has released six annual reports, plus the remaining nine companies' annual reports, for a total of 96 events. After sorting out and saving as CSV file, the corresponding title lines should be: security_ticker, market_ticker, event_date.

3.3 Implementation of the Calculation

In this paper, we use the Event Study package in the alpha library under Python as a calculation tool, which is divided into two classes Signle and Multiple according to the number of events studied. The class Multiple is used to study whether several stocks have abnormal returns during the window period when a particular event is repeated several times for these stocks. Also, libraries such as Numpy, Matplotlib, and excel_Exporter are introduced in this paper for data processing, plotting images, and outputting results. Data are imported using import returns(), results are output using methods plot(), results(). plot outputs AR, CAR and confidence level with default 90%, image format is matplotlib. Figure, results() outputs AR, CAR, T-value and P-value, and passes the corresponding significant level at The CAR of the test is marked with a star, 90% confidence level is marked with *, 95% confidence level is marked with **, and 99% confidence level is marked with ***.

3.4 Output of Results

The total average abnormal returns (AAR)and cumulative average abnormal returns (CAAR)for the ten companies are shown in Figure 1, and the corresponding P- and T-values are shown in Table 2. The events with abnormal returns are shown in Table 3. " indicates the existence of abnormal returns after the event date, "extend" indicates the existence of abnormal returns throughout the event window, "1" indicates the existence of abnormal returns, and "0" indicates the absence of abnormal returns. "0" means no abnormal return exists.

DOI: http://doi.org/10.26549/jfr.v5i2.7177

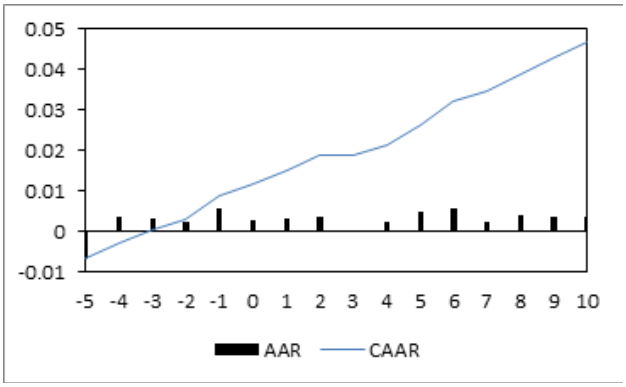

Figure 1. Average results for ten companies

Table 2. Test results for the average return of ten companies

data	AAR	CAAR	T-stat	P-value
-5	-0.00662	-0.0066202	-1.3122	0.094736
-4	0.00392	-0.0026998	-0.37839	0.352573
-3	0.003399	0.00069935	0.080032	0.468107
-2	0.002442	0.00314136	0.311327	0.377778
-1	0.005843	0.00898408	0.796374	0.212913
0	0.002901	0.01188507	0.961733	0.168099
1	0.003276	0.01516115	1.135826	0.128023
2	0.003573	0.01873405	1.31285	0.094626
3	0.000258	0.01899255	1.254846	0.104776
4	0.002495	0.02148726	1.34682	0.089028
5	0.004912	0.0263992	1.577694	0.057328
6	0.005865	0.0322638	1.846092*	0.032449
7	0.002616	0.03487955	1.917466*	0.027598
8	0.004134	0.03901391	2.066731**	0.019388
9	0.003885	0.04289873	2.195469**	0.014072
10	0.003703	0.04660191	2.309257**	0.010471

Table 3. List of events where abnormal yields occurred

event_date	security ticker	event	before	after	extend
28/03/2013	GSYH	event_17	1	1	0
23/03/2019	ZSYH	event_21	1	0	0
30/03/2019	NYYH	event_31	1	1	0
29/03/2017	NYYH	event_33	1	1	0
30/03/2011	NYYH	event_40	0	1	0
31/03/2017	ZGSY	event_43	0	1	0
22/03/2019	ZGPA	event_51	1	0	0
31/03/2017	ZGPA	event_53	0	1	0
26/03/2020	ZGRS	event_60	1	1	1
28/03/2019	ZGRS	event_61	1	0	0
23/03/2018	ZGRS	event_62	1	0	0
24/03/2016	ZGRS	event_64	1	0	0
30/03/2018	ZGYH	event_73	1	1	0
27/03/2014	ZGYH	event_77	1	1	1
23/04/2020	ZGZM	event_81	1	1	1
26/03/2020	HTWY	event_91	1	1	1

4. Description of the Empirical Evidence

4.1 Analysis of Results

There were 16 events with abnormal returns out of a total of 96 events, indicating that the domestic annual report effect was less pronounced, and the abnormal returns were dominated by positive abnormal returns. Of the 16 events with abnormal returns, 12 events had ex ante abnormal returns, while 11 events had ex post abnormal returns, suggesting a possible insider phenomenon in the disclosure of annual report events.; In terms of companies, China Life has the highest number of abnormal returns among the 10 companies; in terms of different years, the abnormal returns occurred mainly in the last 4 years, as shown in Figure 2.

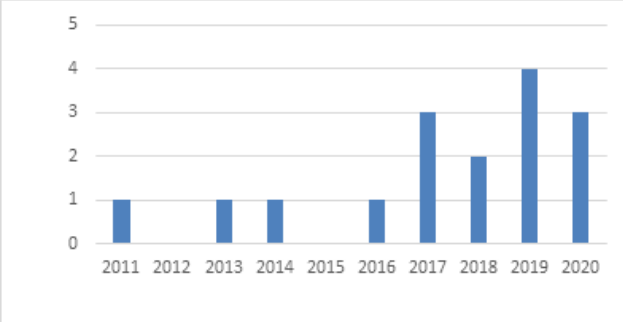

Figure 2. Number of abnormal yields by year

4.2 Conclusions

4.2.1 There is a problem of insider information leakage

The normal situation should be that abnormal stock price fluctuations occur only on the day of the release of the company's annual report. And the abnormal movement before the release of the event indicates that certain institutional investors and individual investors in the market received the information before the company's operation was announced through legal channels and sold and bought in advance, or pulled up the price to sell and pulled down the price to buy. This also indirectly shows that the effectiveness of the A-share market is not that high, and the effectiveness of the enforcement of laws and regulations related to insider trading needs to be strengthened.

4.2.2 China's annual report effect is not obvious

The top ten stocks in terms of market capitalization do not reflect the occurrence of annual reports very clearly. In terms of the securities market, China to the present high concentration of equity, the liquidity conditions are not so relaxed, so it may lead to the results of stock movements

DOI: http://doi.org/10.26549/jfr.v5i2.7177

are not obvious. In terms of the ten selected Chinese stocks, all of them are SOEs, which have been benefiting from the government's long-term support and have unique advantages in terms of many resources. Investors always believe that SOEs have the government behind them, no matter how good or bad the business results are. So, it will also lead to the study of the event on the stock price impact effect is not obvious.

4.3.3 Positive abnormal returns occur mostly

The annual report effect is mainly used to measure the market reaction when listed companies release their annual reports. Positive abnormal returns indicate that market sentiment is high and stock prices are overvalued at this time. Because of the development of the capital market, there are mega-listed companies in the Chinese securities market, and investors become overly concerned about these companies. The behavioral bias of being overly optimistic about these companies after a series of good news of increased surplus can lead to abnormal stock yields. At the same time, the lack of a shorting mechanism in the Chinese market makes investors more willing and able to focus only on positive events.

Authors' Contributions

Liu Xin, Huang Xi, Students at School of Statistics, Chengdu University of Information Technology .

Su Ganya, Teacher at School of Statistics, Chengdu University of Information Technology.

References

[1] Tian Feng. Preliminary exploration of the phenomenon of performance forecast effect of A-share annual reports [J]. Modern Economic Information,2013(03):187.

[2] Zhou Zhanqiang, Wang Zijian. Securities market anomalies and their theoretical explanation[J]. Management Modernization,2002(02):21-25.

[3] Chen Tao. An empirical study on the effect of annual reports in the Chinese securities market[D]. Southwest University of Finance and Economics, 2005.

 DOI: http://doi.org/10.26549/jfr.v5i2.7177

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Financial Analysis of MI's Company Based on Harvard Analysis Framework

Jingxian Guo[1*] Yuanxi Yang[2]

1. School of Management, Shandong University of Technology, Shandong, 255000, China
2. School of Business, Hong Kong Baptist University, Hong Kong, China

ARTICLE INFO

Article history
Received: 21 July 2021
Revised: 28 July 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Harvard Analytical Framework
Financial ratios
Strategic analysis

ABSTRACT

This paper takes the financial statements of MI from 2017to 2019, and uses Harvard analysis framework to analyse the financial situation of MI. The analysis content mainly includes enterprise macro environment, industry competitive analysis and financial ratio analysis. This paper tried to understand the current situation and development prospect of MI. Based on the analysis of MI's financial situation under the framework of Harvard, we summarized the existing problems and put forward suggestions.

1. Introduction

Analysis of Harvard Analytical Framework not only understands the financial situation of enterprises, but also knows the strategic perspective of enterprises. It can combine the macro environment and corporate strategy [1]. We can know more comprehensive and accurate information of enterprises. External users may obtain accurate information of enterprise, so as to meet the information needs of investors. In addition, for internal managers, using this framework can predict enterprise risks and help to avoid risks [2].

Beijing MI Technology Co., Ltd. is an Internet company. It specializes in the development of smart devices and electronic products, focusing on the innovation in the construction of high-level smart phones, internet TV and ecological chain. MI has a 30% market share in India, was officially listed on the Hong Kong Stock Exchange on July 9, 2018. The paper is expected to find problems and put forward countermeasures through the harvard analytical framework on MI.

2. Strategic Analysis

2.1 Macro Environment Analysis

First, politics. MI's market share has been helped by the state's support for the telecom industry. The government attaches great importance to the development of private enterprises, vigorously supports technology-

**Corresponding Author:*
Jingxian Guo,
School of Management, Shandong University of Technology, Shandong, 255000, China;
Email: gjx278@163.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7703

based enterprises [3], and encourages innovation. Second, economic factors. China has a large population and a large sales market. The country strongly supports the domestic and foreign double cycle, the MI ushered in the domestic market development opportunity. Third, social and cultural factors. Mobile phone use is regional, with one-third of the users concentrated in northern cities and fewer in southern cities. MI' phones with low price and high performance become the first choice for consumers. Finally, technical factors. MI' Group has its own design and development technical team. It regularly sends technical personnel to attend training courses and visit abroad, which is the guarantee of high efficiency.

2.2 Enterprise Strategy Analysis

In terms of product strategy, MI's mobile phones are high quality in the integration of hardware and software. In terms of service strategy. MI's mobile phone is positioned in the mobile phone enthusiast. Let the enthusiast participate in the research and development, design and improvement of the system. So as to better close to consumers and more detailed service. In terms of personnel strategy, its core staff consisted of well-known IT enterprises at home and abroad [4], such as Microsoft, Google and Motorola, which had a strong technical advantage. In terms of competitive strategy, MI mainly locks the user through MI's chat, attracting users to understand and buy MI's mobile phone. In terms of diversification strategy, with the improvement of MI operating system and the increasing market share, MI is expanding into many fields such as network TV, MI's boxes, routers etc.

3. Accounting Strategy Analysis

3.1 Quality Analysis

Table 1. inventory quality analysis

	2017	2018	2019
inventory (HK$ a hundred million)	163.43	336.46	363.77
Total assets （(HK$ a hundred million)	898.70	1657.47	2049.93
Inventory turnover(time/year)	8.19	6.67	8.05
Inventory turnover period (days)	35.05	53.97	44.72

As can be seen from 2018 to 2020 in Table 1, with the increase of total assets, MI total inventory increased year by year. Due to the small amount of receivables and Fixed assets, a number of investments were made in 2017 and 2019. Inventory turnover ratio accelerated, which indicates that the operation efficiency of enterprise assets is high [5]. Although the MI's production capacity is limited, and demand is exceeding supply. But its starvation sales will lead to a small increase inventory.

3.2 Accounts Receivable Quality Analysis

Table 2. aging analysis of accounts

aging	2018		2019	
	Expected loss rate	amount of loss	Expected loss rate	amount of loss
Within the time limit	0.01%	49	0.01%	49
Within 3 months overdue	0.99%	5.3	0.96%	4.44
3 to 6 months overdue	34.22%	0.64	37.27%	0.51
More than 6 months overdue	52.85%	0.77	41.59%	0.81
total		55.71		53.76

Most of MI's sales are online, accounts receivable are mostly payments to channel distributors and customers in mainland China and India. The default rates of MI's mobile phones is lower than the average of the industry. As shown in the Table 2, the default rates have a little change from 2018 to 2019. Therefore, The quality of accounts receivable is high. The policy of accounts receivable is reasonable.

3.3 Cash Flow Analysis

Table 3. cash flow analysis (unit: HK$ a hundred million)

	2018	2019
Net cash flow from operating activities	-14.15	265.81
Net cash flow from investment activities	-75.08	-352.43
Net cash flow from financing activities	265.74	34.84
Net increase in cash and cash equivalents	176.52	-51.78

As shown in the Table 3, the net profit of MI's group has been increasing from 2018 to 2019. The net cash flow of operating activities has been negative in 2018, but the net cash flow of operating activities is a big increase in 2019. This shows that the business activity is getting better and better [6]. From the structure of the cash flow statement, MI have been investing and expanding. The company went public in 2018, and its financing capacity increased dramatically during the listing year, so the enterprise diversified development of funds is sufficient. On the other hand, MI has sufficient financial security, and can invest in research and development and achieve high-quality development. The market is optimistic about the diversified development path in future [7].

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7703

4. Financial Ratio Analysis

4.1 Solvency Analysis

Table 4. solvency analysis

	2018	2019
asset-liability ratio	50.94	55.53
current ratio	1.71	1.49

Debt paying ability concerns the economic benefits of the enterprise and creditor, usually using financial ratios as an important project. For this purpose, Table 4 analyzes the long-term and short-term solvency of enterprises by asset-liability ratio and current ratio. MI's liabilities in 2017 exceeded the amount of assets, indicating that the financial risk of the enterprise is bigger. It may be related to the adjustment of corporate financing structure before MI's 2018 listing. However asset-liability ratio is about 50% in 2018 and 2019. Therefore, in general, the long-term solvency of MI is good, and no financial risk. In addition, the current ratio has been stable from 2018 to 2019, but the current ratio is lower than 2:1, indicating that the enterprise's current assets have a relatively weak ability in the short term, this may have something to do with higher inventories.

4.2 Operation Capacity Analysis

Table 5. operating capability analysis

	2018	2019
current asset turnover	1.69	1.64
fixed asset turnover	4.39	4.56
total asset turnover	1.23	1.43

Table 5 is an analysis of the operating capacity of MI's assets. The indicators include current assets turnover, fixed assets turnover and total assets turnover. This is shown in Table 5. These three indicators are little changed from 2018 to 2019. The total asset turnover ratio is greater than 1, and there is a slight upward trend. This is indicating that MI's assets operation efficiency is higher, which enhances the profitability of the company. Because the enterprise has less fixed assets, the turnover rate of fixed assets is higher. From these three indicators, MI has a strong asset operation ability and a high asset use efficiency, which indicates that the enterprise has a good asset management ability.

4.3 Profitability Analysis

Table 6. profitability analysis

	2018	2019
return on equity	2.42	1.59
net interest rate on total assets	1.19	0.71
net profit rate on sales	7.71	4.91
gross profit margin	12.68	13.87

Table 6 is the profitability index of the enterprise. According to the comparative analysis of these indicators in 2018 and 2019, the overall profitability of MI has declined. There was a slight increase in gross margin from 2018 to 2019. It shows that the benefit of MI's activities has an upward trend. But the net profit rate of sales decreased greatly, which may be related to the substantial increase in expenses during the listing and expansion of the scale of the enterprise. The net interest rate on total assets is not high in these two years, indicating that the enterprise to improve the profitability of assets is the focus in the future.

5. Problems in MI's Financial Situation

5.1 Strategic Problem

MI makes use of the Internet to carry out sales, which plays a promotional role in a short period. However, the management of MI does not pay attention to the foresight of high-end market. In China, MI's low-priced phones can indeed grab a part of the domestic market and occupy 30% of the market share in foreign countries, especially in India [7]. However, the profit of low-priced phones is not significant. On the other hand, MI's mobile phone is positioned as a passionate mobile phone. It creatively uses the internet to let users participate in the design. This mode can satisfy the diversified needs, but the innovation requirements are relatively high.

MI development strategy of enterprises leads to a large amount of diversified investment, so a capital turnover rate and asset efficiency are low. Because not brand awareness of many products, the lack of users and brand reputation is too limited to higher benefits .

5.2 Financial Problems

MI may be the world's largest IPO in recent years, topping $100 billion in the seven years. But MI's inventory is rising and money is piling up. Short-term and long-term debt paying ability is lower than industry average level. Asset turnover and profitability also has a downward trend. The rate of return on investment is not ideal, the profit still comes from the profit of mobile phone, so the road of enterprise diversification is not smooth. Enterprise income and profit growth are not stable, operating risks have increased.

6. Suggestions for MI's Future Development

6.1 Suggestions on MI's Development Strategy

The development of high-end enterprises is a long-term process and an inevitable trend. High-end brands should

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7703

be mainly high income group, and the pricing of the brand should be based on demand. The investment in research and development will increase exponentially, and the corporate income will be greatly reduced in a short time. However, MI should have the determination to establish a high-end brand. In marketing, the enterprise should be set up their own parts production plant, so as to expand the market share [8].

6.2 Suggestions on MI's Financial Problems

MI should focus on clearing inventory, reducing the production of existing mobile phone models. On the other hand, through improving the asset turnover rate to enhance corporate profitability [9]. At the same time, MI may allocate more funds for research and development or new product development. Constantly increase the investment in fixed assets, in order to improve the stability of business operations. MI should reduce diversified investment, focus on high-end product development, so as to increase the share of high-end market.

References

[1] Zhang X Z. Reflection on the construction of financial analysis system in China. Accounting Research,2001(6):33-39.

[2] Zhang Xinmin, Su Lizhong.Financial Statement Analysis: Theoretical Connotation and Subject Orientation. Financial Research,2015(1):25-33.

[3] Chen Qingyun, Wang Lixia.Analysis of IT Company's Financial Statements under the Framework of Harvard Analysis. Modern Business Industry, 2019,40(11):116-117.

[4] Zhang Haiquan. Research on the development and positioning of financial analysis theory. Time Finance,2016(5):109-111.

[5] Lu Cheng, Lin Chuqi. Application of DuPont analysis method in financial analysis. Commercial Accounting,2016(7):53-55.

[6] Zheng Xiaoguang, Ban Zhen.Risk analysis of diversification of listed companies -- A case study of Chongqing Brewery. Commercial Accounting,2016(10):89-91.

[7] Breymann W, Kelly L,Empirical Analysis and Modeling of Diversified World Stock Indices.Asia-Pacific Financial Markets, 2017,12 (1):1-28.

[8] Li JunDong. Analysis and Application of Financial Reporting Based on Harvard Analytical Framework. Finance and Accounting,2013 (9):50-52.

[9] Wang Rong. On the application of "Harvard Framework" in the financial analysis of highway survey and design enterprises.Transportation Finance and Accounting,2017 (9):49-51.

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7703

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Economic Effect of Rural Labor Transfer in China

Cheng Li Zhixin Zhang Yue Jin*

School of Economics, Shandong University of Technology, Zibo, Shandong, 255049, China

ARTICLE INFO

Article history
Received: 2 September 2021
Revised: 10 September 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Rural labor transfer
Economic effect
Difference of factors

ABSTRACT

With the continuous development of China's economy and the acceleration of urbanization, more and more rural labor force is gradually transferred to cities and non-agricultural industries. Although the transfer of rural labor force can increase farmers' income, improve farmers' quality of life, and accelerate the process of urbanization and agricultural modernization in China, the unreasonable transfer of rural labor force has also brought some problems to China's agricultural development. This paper mainly through the method of combining theoretical derivation and empirical analysis, using the data from 2010 to 2015 to analyze, study the influence of rural labor transfer on agricultural production, explore the relationship between rural labor transfer and agricultural development and provide relevant policy suggestions.

1. Introduction

As a large agricultural country, the importance of agriculture to our country is self-evident, but our country is in the stage of development from agricultural country to industrial country, so the study of rural labor transfer is necessary. In addition, China is a large population country with abundant labor resources, so the rational use and allocation of labor resources is very important. Studying the impact of rural labor transfer on agricultural development is conducive to achieving the economic goal of full employment. As a developing country, one of the most important features of China's economic growth and agricultural transformation is the transfer of rural labor force from the agricultural sector to the non-agricultural sector and from rural areas to cities. The transfer of rural labor force is an important way for developing countries to accelerate urbanization, increase farmers ' income and improve rural comprehensive income [1].

At present, China's labor supply and demand relationship is undergoing new changes, because China is in a low fertility level for a long time, resulting in a shortage of labor resources in China, the shortage of working age population. According to statistics, from 2006 to 2015, the growth rate of China's working-age population aged 15-64 decreased year by year, and even showed negative growth from 2013 to 2015. Although the two-child policy was implemented in 2015, the labor institution did not change significantly in a short period of time. At the same time, the structural contradiction of employment was more prominent, and periodic unemployment would often occur. For the labor force transferred from rural areas, it would bear greater impact of periodic unemployment. So how to use rural labor more efficiently and reasonably is a big problem in the labor shortage. Greater government attention and policy support are needed [2]. Since the reform and opening up in 1978, more and more rural labor began to transfer to the city, which has a great impact on China 's agricultural development.

According to statistics, the number of rural labor force

*Corresponding Author:
Yue Jin,
School of Economics, Shandong University of Technology, Zibo, Shandong, 255049, China;
Email: jinyue1018yy@126.com

DOI: http://doi.org/10.26549/jfr.v5i2.7708

employed outside China increased from 2 million in 1983 to 282 million in 2016, an increase of nearly 141 times over the past 33 years. In 2016, a total of 1.314 million new jobs were created in cities and towns, and the total number of migrant workers in China was 2.81.71 million, including 16.934 million migrant workers. More and more rural labor force began to shift to cities, which also had a certain impact on China's agricultural development. On the one hand, the transfer of rural labor accelerates the economic development of rural and underdeveloped areas, on the other hand, it also contributes to the economic development of cities and developed areas. The transfer of rural labor force has promoted scientific development, accelerated the process of industrialization and urbanization, promoted the construction of new socialist countryside, and made contributions to accelerating the integration of urban and rural development in China. Therefore, the study of rural labor transfer on agricultural development is very meaningful [3].

The main structure of this paper is as follows: The second part is literature review. The third part is the theoretical analysis of the impact of rural labor transfer on agricultural development, which mainly includes Lewis model, Lanis-Fei model and agricultural development theory. The fourth part is the analysis of the current situation of rural labor transfer in China. The fifth part is the empirical analysis of the impact of rural labor transfer on agricultural development. It mainly studies the impact of rural labor transfer on agricultural production by establishing the Douglas production function and agricultural production function and conducting regression analysis. The sixth part is the conclusion and policy analysis, and puts forward suggestions on how to efficiently and reasonably transfer rural labor in China.

2. Literature Review

In today's scarce labor resources, the transfer of rural labor resources research is very necessary, since the reform and opening up, the impact of rural labor transfer research has been carried out, this paper mainly from two aspects to analyze the transfer of rural labor, on the one hand is the impact of rural labor transfer factors, on the other hand is the impact of rural labor transfer.Institutional ownership has a promoting effect on enterprise innovation.

Zhang Zhixin (2011) found that due to the transfer of a large number of young rural labor to the city, the majority of the population in rural areas are the elderly, women and children. The labor time of these detainees increases significantly, and even exceeds the labor time of young labor under the same conditions [4]. Wu (2017) analyzed from the three aspects of human capital loss, capital flow and land transfer that there are still many problems to be solved in the process of rural labor transfer. For example, the transfer of rural labor will widen the economic differences between the exporting areas and other regions, and will have a negative impact on the development of agricultural economy [5]. He believes that there are still many problems in the development of urbanization, which will have a negative impact on the continued transfer of rural labor in China. Li Xuhui et al. (2018) found that the flow of rural labor outside the province will increase many additional working hours for the left-behind population in rural areas, which will have a negative impact on rural development in China [6]. By analyzing the data of Shandong, Zhejiang, Henan, Jiangsu and Shanxi from 2004 to 2010, Ge Qingen et al. (2014) concluded that the transfer of rural labor has had a negative impact on agricultural production. China's Lewis turning point has come, but in today's economic structure, there are still more rural labors in urgent need of outward transfer [7].

On the other hand, the researchers, represented by Mingdou (2012), concluded through a comparative analysis of the data that even if a large number of rural labors were transferred to cities, rural surplus labor could still maintain normal agricultural production [8]. Shuo (2005) through the analysis of rural labor transfer in Henan Province concluded that the transfer of rural labor to urban and non-agricultural industries can increase farmers' income, improve the quality of life of farmers, but also can increase the overall income of rural areas, which has played a great role in accelerating the development of urbanization in China [9]. Wen (2010) pointed out that even if the transfer of rural labor force will cause some adverse effects on agricultural development, but in general, the transfer of rural labor force will increase farmers ' capital investment in agricultural production, thereby promoting China's agricultural development [10].

Although many scholars have different views on the impact of the transfer of rural labor force, there are still more and more rural labor force transferring to cities and non-agricultural industries, which is bound to affect the development of agriculture in China. Therefore, this paper mainly analyzes the impact of rural labor force transfer on agricultural development from the perspective of agricultural production, and puts forward relevant policy suggestions.

3. Current Situation of Rural Labor Transfer in China

3.1 Urban and Rural Employment Status

China's total employment showed a rising trend year by

 DOI: http://doi.org/10.26549/jfr.v5i2.7708

year, from the perspective of urban and rural employment, China's rural employment is less and less, more and more urban employment, the following table shows :

Table 1. Population of Urban and Rural Employment in China 2010-2015

particular year	Employment (thousands)	Urban employed persons (thousands)	Rural employed persons (thousands)
2010	76105	34687	41418
2011	76420	35914	40506
2012	76704	37102	39602
2013	76977	38240	38737
2014	77253	39310	37943
2015	77451	40410	37041

Source: annual data released by the National Bureau of Statistics in 2016

Table 2. Urban and rural population in China, 2010-2015

particular year	Urban population (thousands)	Rural population (thousands)
2010	66978	67113
2011	69079	65656
2012	71182	64222
2013	73111	62961
2014	74916	61866
2015	77116	60346

Data source: the population sampling survey data of the National Bureau of Statistics.

The data of 2010 are the estimated data of the current population census, and the data of the remaining years are the estimated data of the annual population sampling survey.

In general, the total employment in China shows an upward trend year by year. However, from the perspective of separation, the change trend of rural employment and urban employment in China is completely opposite. From the perspective of total population, the number of urban population and rural population in China also show the same trend. Therefore, it can be seen that the reason why the change trend of rural employment and urban employment is opposite is that more and more rural labor force is transferred to cities and can settle in cities. More and more rural household registration is transferred to urban household registration.

3.2 Regional Distribution of Labor Transfer

Table 3. Regional distribution of migrant workers in export and import areas (in thousands)

region	2015	2016	increment
By output:			
the east part	10300	10400	100
Central region	9174	9279	105
western regions	7378	7563	185
northeast	895	929	34
By input :			
the east part	16008	15960	-48
Central region	5599	5746	147
western regions	5209	5484	275
northeast	859	904	45
In other areas	72	77	5

Note : Other areas refer to Hong Kong, Macao, Taiwan and abroad.
Data sources : National Bureau of Statistics 2016 migrant workers monitoring report

From Table 3, it can be seen that the fastest growing number of migrant workers in the western region from 2015 to 2016. According to the input area, migrant workers in the eastern region have a negative growth. It can be seen that from the geographical point of view, the trend of China's rural labor force outward transfer is from the eastern region. The reason for this phenomenon is partly due to policy reasons, mainly the proposal and implementation of China's "Belt and Road" policy, and the other part is the spontaneous role of China's labor market. Because most of the knowledge level of China's rural labor force is not high, and the low-quality labor market in the eastern region of China has become saturated, so more and more rural labor forces choose to transfer to other economically underdeveloped areas.

3.3 Age Structure of Rural Labour Force

Table 4. Age composition of rural migrant workers in China from 2012 to 2016 (unit: %)

Ages	2012	2013	2014	2015
16-20 jahr	4.9	4.7	3.5	3.7
21-30 jahr	31.9	30.8	30.2	29.2
31-40 jahr	22.5	22.9	22.8	22.3
41-50 jahr	25.6	26.4	26.4	26.9
50 aged above	15.1	15.2	17.1	17.9

Data Source: National Bureau of Statistics 2016 migrant workers monitoring report

From Table 4, China's rural labor force is still dominated by young adults, but the proportion continues to decline, the average age of rural labor continues to

DOI: http://doi.org/10.26549/jfr.v5i2.7708

increase. From the average age, the average age of rural labor force in 2016 was 39 years old, which was 0.4 years higher than that of last year. In terms of age structure, the proportion of rural labour under 40 is 53.9 per cent, down 1.3 percentage points from the previous year. The proportion of rural labour over 50 is 19.2 per cent, an increase of 1.3 percentage points over the previous year. It can also be seen that China's rural labor aging phenomenon is serious, which is an important problem in China's labor market.

3.4 Education Level of Rural Labour Force

Table 5. Composition of educational level of rural migrant workers in China from 2012 to 2016

level of education (unit : %)	2012	2013	2014	2015
No school	1.5	1.2	1.1	1.1
primary school	14.3	15.4	14.8	14.0
junior high	60.5	60.6	60.3	59.7
senior high	18.0	16.1	16.5	16.9
college or higher	5.7	6.7	7.3	8.3

Data sources: National Bureau of Statistics 2012-2016 migrant workers monitoring report

From the perspective of educational level, most of the rural labor force in China is junior high school, and the educational level is not high. However, from the perspective of trend, the knowledge level of rural labor force in China is constantly improving. From the above analysis results, the improvement of the knowledge level of rural labor force can promote China's agricultural development. Therefore, the emergence of this phenomenon shows that China's policy of attaching importance to education has achieved effective results. The improvement of rural labor knowledge level can provide guarantee for the more effective operation of China's labor market.

4. Authentic Proof Analysis

4.1 Model Specification

This paper studies the impact of rural labor transfer on agricultural production by establishing Cobb-Douglas production function. Because Cobb-Douglas production function is the most widely used production function with strong explanatory power, the output of agricultural production is related to a variety of production factors of agricultural input. In order to study the impact of rural labor transfer on agricultural output, Cobb-Douglas production function is established. The basic model of Cobb-Douglas production function is Q = AL ^ αK ^ β, where Q represents the total output, A represents the constant term, L represents the input of labor capital, K represents the input of capital, α represents the output elasticity of labor, and β represents the output elasticity of capital. This paper mainly constructs the production function from three aspects of labor, capital and technology. Firstly, the explanatory variables are selected as the total output value of agriculture, forestry, animal husbandry and fishery (Y), the input of labor capital is selected as the employees of agriculture, forestry, animal husbandry and fishery (L), the input of capital is selected as the pure amount of agricultural fertilizer application (K), and the technical progress of farmers is selected as the total power of agricultural machinery (A). Y = λ _ 0 A ^ (λ _ 1) L ^ (λ _ 2) K ^ (λ _ 3) (1) In order to make data analysis more accurate and reduce heteroscedasticity, we logarithmicize formula (1) and transform exponential equation into linear equation as follows : ln [Y = λ _ 0] + λ _ 1 lnA + λ _ 2 lnL + λ _ 3 lnK (2).

4.2 Variable Definition

For the convenience of research, this paper mainly selects the data from 1996 to 2015 for analysis. The data are mainly from the National Bureau of Statistics and the 2016 National Statistical Yearbook. The specific data are as follows:

It can be seen from the above table that China's agricultural, forestry, animal husbandry and fishery employees are negatively correlated with China's total agricultural output. China's total agricultural output increases year by year, but the number of agricultural, forestry, animal husbandry and fishery employees decreases year by year. Other factors, such as capital and technology level and China's agricultural output showed a positive correlation characteristics, are increasing year by year. It can be found that China's agricultural technological progress and agricultural capital investment have certain substitution for China's agricultural, forestry, animal husbandry and fishery practitioners.

4.3 Regression Analysis

OLS regression analysis of equation (2), the regression results are as follows:

When n = 20, k = 3, DL is 0.774, DU is 1.410. The regression results show that the DW value is greater than 0 and less than DL, and the equation has a positive autocorrelation. The R-square is close to 1, and the goodness of fit is high. The regression results can be concluded that the correlation coefficient of agriculture,

 DOI: http://doi.org/10.26549/jfr.v5i2.7708

Table 6. Data table on gross output value and influencing factors of agriculture, forestry, animal husbandry and fishery in China, 1996-2015

Year	Total output value of agriculture, forestry, animal husbandry and fishery (ten thousand tons)	Agriculture, forestry, animal husbandry and fishery practitioners (thousands)	Pure amount of agricultural chemical fertilizer (ten thousand tons)	Total power of agricultural machinery (kilowatts)
1996	22353.7	32260.4	3827.9	38546.9
1997	23788.4	32677.89	3980.7	42015.6
1998	24541.9	32626.4	4084	45207.7
1999	24519.1	32911.76	4124.3	48996.12
2000	24915.8	32797.5	4146.41	52573.61
2001	26179.65	32451.01	4253.76	55172.1
2002	27390.8	31990.58	4339.39	57929.85
2003	29691.8	31259.63	4411.6	60386.54
2004	36238.99	30596	4636.6	64027.91
2005	39450.89	29975.54	4766.22	68397.85
2006	40810.83	29418.41	4927.69	72522.12
2007	48892.96	28640.68	5107.83	76589.56
2008	58002.15	28363.6	5239.02	82190.41
2009	60361.01	28065.26	5404.4	87496.1
2010	69319.76	27694.77	5561.68	92780.48
2011	81303.92	27355.42	5704.24	97734.66
2012	89453.05	27032.25	5838.85	102558.96
2013	96995.27	26701.20	5911.86	103906.75
2014	102226.09	23359.20	5995.94	108056.58
2015	107056.36	22458.90	6022.6	111728.07

Source: National Statistical Yearbook 2016, based on the National Bureau of Statistics.

Dependent Variable: Y
Method: Least Squares
Date: 05/08/17 Time: 21:05
Sample: 1996 2015
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
L	-2.343210	1.193526	-1.963266	0.0662
K	20.50031	17.85826	1.147946	0.2669
A	0.270523	0.721005	0.375203	0.7121

R-squared	0.952040	Mean dependent var	51674.62
Adjusted R-squared	0.946398	S.D. dependent var	29443.86
S.E. of regression	6816.903	Akaike info criterion	20.62968
Sum squared resid	7.90E+08	Schwarz criterion	20.77904
Log likelihood	-203.2968	Hannan-Quinn criter.	20.65884
Durbin-Watson stat	0.260124		

Figure 1. OLS regression analysis results of influencing factors of agricultural output

DOI: http://doi.org/10.26549/jfr.v5i2.7708

forestry, animal husbandry and fishery practitioners on agricultural output is negative, but the correlation coefficient of other factors ' capital investment and agricultural technology level on agricultural output is positive, which shows that the transfer of rural labor force to the city not only does not reduce agricultural output, but will increase agricultural output. From the above diagram, every 1 % reduction of rural labor force will increase agricultural output by 2.34 %. The reason for this phenomenon is likely to be that the substitution effect of agricultural capital investment and technological progress on rural labor force exceeds the impact of rural labor force on agricultural output.

Based on the above theoretical analysis, it can be seen that the transfer of rural labor does not necessarily have a negative impact on agricultural development. Since China's reform and opening up, the process of industrialization and urbanization has been accelerating, and more and more rural labor force has been transferred to cities, which has led to the shortage of agricultural labor supply in China and has adversely affected China's agricultural development. In order to alleviate this situation, China has introduced some preferential agricultural policies, such as direct subsidies for farmers: farmland protection subsidies, agricultural machinery purchase subsidies, corn producers subsidies. Support the development of new agricultural business entities: new farmer occupation cultivation, farmer cooperatives and family farm capacity building, agricultural credit guarantee system construction. These policies can effectively increase the input of agricultural capital, can introduce cheaper production factors, improve the quality of labor so as to improve the technical level, increase China's agricultural output, and promote China's agricultural development.

5. Conclusions and Policy Suggestion

5.1 Research Conclusions

Through the combination of theoretical research and empirical research, we can get the following conclusions:

China's rural labor force 'aging' phenomenon is serious, the quality of the labor force continues to improve

It can be seen from the data analysis that the 'aging' phenomenon of China's rural labor force has emerged, which shows that China's rural labor force has transited from absolute surplus to relative surplus, and the marginal output of rural labor force on agriculture is increasing. If the rural labor force continues to shift to urban and non-agricultural industries, it will have a negative impact on China's agriculture. At the same time, the policy implementation effect of improving the quality of farmers in China is obvious, and the knowledge level of rural labor force in China is continuously improved, which provides a basis for improving the level of agricultural technology in China.

Overall, China 's rural labor transfer promotes agricultural development

From the results of empirical analysis, China's rural labor force has a reverse correlation with China's agricultural development, that is, the transfer of rural labor force to cities increases China's agricultural output, and other factors such as capital and technology have a positive correlation with China's agricultural output, that is, the increase in agricultural capital input and the progress of technological level also increase China's agricultural output and promote China's agricultural development.

From the perspective of labour factors, the transfer of rural labour has adverse effects on agricultural development

On the one hand, the transfer of rural labor force in China has reduced the number of labor force that China invests in agriculture. On the other hand, it has reduced the quality of labor force in China's agricultural sector and changed the structure of labor force in China's agricultural sector. It is mainly manifested in the serious "aging" phenomenon of rural labor force, and the proportion of female labor force has increased year by year, which has adversely affected China's agricultural production and hindered the sustainable development of China's agriculture.

The substitution effect of capital and technology on the labour force is evident

From the regression results, agricultural capital and technical elements are positively correlated with China's agricultural output. The increase of the two elements will increase China's agricultural output. The substitution effect of agricultural capital and technical elements exceeds the impact of rural labor transfer on agricultural output, and ultimately leads to an increase in China's agricultural output.

5.2 Policy Proposal

Increase financial expenditure on agriculture in China and continue to promote the implementation of preferential agricultural policies

Since the Central Committee of the Communist Party

 DOI: http://doi.org/10.26549/jfr.v5i2.7708

of China issued the first "No. 1 Document" on the "three rural issues" in 1982, the state has paid more and more attention to the development of the agricultural sector, and has successively introduced many preferential agricultural policies. In 2014, the Ministry of Agriculture issued 50 preferential agricultural policies, of which only grain subsidies, seed subsidies, comprehensive agricultural subsidies, agricultural subsidies and other four subsidies reached 160 billion yuan. The implementation of these policies has greatly increased China's agricultural output and promoted the development of urbanization in China. But China's farmers' grain income is difficult to improve this is still a problem plaguing the sustainable development of agriculture, in order to solve this problem, the state should continue to increase the financial expenditure of the agricultural sector, continue to strengthen the agricultural sector subsidies and investment.

Strengthening investment in education and agricultural technology for rural labour

From the analysis results can be seen that China's rural labor force is still in the low quality level stage, the knowledge level is low, and the demand for high-quality labor force in modern society is more and more, so increasing investment in rural education can promote the development of urbanization in China. The government can improve the quality of rural labor force by increasing financial support, establishing more rural schools, strengthening compulsory education and strengthening subsidies for students in poor areas. Technical factors will also have a great impact on China's agricultural development. In order to improve the technical level of agriculture in China, the government can increase the use of new agricultural science and technology by increasing agricultural scientific research and agricultural technology promotion. Strengthen the vocational and technical training of rural labor force to promote the improvement of technical level.

Encourage and promote the return of rural labourers to entrepreneurship

Encouraging rural labor to return home employment can increase the investment of agricultural labor in China on the one hand, on the other hand can increase the investment of agricultural capital, so as to promote agricultural development. The government can give more preferential and policy support to the rural labors who return home for employment, promote the development of private enterprises, and attract more rural labors to return home for employment by establishing agricultural projects [10].

Promoting integrated urban and rural development

From the current point of view, the gap between urban and rural areas in China is still relatively obvious, and the gap between urban and rural areas is large. In order to coordinate the integration of urban and rural development, the government should establish a more effective social security system, improve the level of rural social welfare in China, such as improving China's rural medical security system, improve China's rural education environment, the implementation of complete compulsory education in poor areas, etc., on the other hand, the government should provide more protection to the rural labor force, such as migrant workers ' wage security, unemployment security, etc., which can promote the integration of urban and rural development in China.

References

[1] Translated by Lewis and Shi et al., dual economic theory [M]. Beijing Institute of Economics Press, 1989.

[2] Theodor W. Schultz.Renovation of traditional agriculture [M].The Commercial Press, 1987.

[3] Kong Xiangzhi et al.Agricultural economics [M]. Publisher of Renmin University of China, 2014.

[4] Zhang Zhixin, Li Ya, Ren Xin.Differences in regional economic development and rural labor transfer - - An empirical analysis based on panel data of 17 cities in Shandong Province from 1999 to 2008 [J].Dong Yue, 2011,32 (10) : 129-133.

[5] Wu Renge Rile. The positive effect of population aging on economic growth — from the perspective of human capital investment. [J] Shandong Social Sciences, 2017, {4} (04) : 90-95.

[6] Li Xuhui, Peng Xianmei, Ma Chengwen.The contribution of rural labor transfer to economic growth in China [J].Financial and trade research, 2018,29 (04) : 46-56.

[7] Ge Qingen, Zhu Xi, Shi Qinghua. The impact of labor transfer on agricultural production in China [J]. Economics (Quarterly), 2014,13 (03) : 1147-1170.

[8] Mingdou W Y Z. The Transfer Mechanism of Rural Surplus Labor Force and Operation Target of Urbanization Economy [J]. Finance & Economics, 2012, 6.

[9] Shuo C, Sujie F. Rural Surplus Labor Transfer and Economy Growth Rate [J]. Nankai Economic Studies, 2005, 5.

[10] Wen-yu W U. Rural Surplus Labor Force Transfer in the Northwest Minority Areas: a case study on Qinghai Noodle economy[J]. Northwest Population Journal, 2010, 2.

DOI: http://doi.org/10.26549/jfr.v5i2.7708

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

The Impact of the Network Trade Era on the Chinese (Asian) Economy

Bing Han*

Rissho University, Osaki Shinagawa-ku, Tokyo, 141-8602, Japan

ARTICLE INFO

Article history
Received: 20 June 2021
Revised: 30 June 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Network trade
China's economy
Impact

ABSTRACT

With the rapid development of the Internet and information technology, network trade has emerged and broken through the traditional trade boundaries in the rapidly developing information technology. Therefore, with the advent of the information age, network trade has had a series of impacts on China's economy, which has given wings to the take-off of China's economy, but also made the development of China's economy face a new environment and new challenges. Based on this, this paper first analyzes the connotation of network trade, and analyzes the impact of the network trade era on China's economy. Through such a study, it aims to make China better seize the opportunities of the times and meet the challenges of the times in the process of promoting social and economic development, so as to achieve a good and rapid development of the national economy.

1. Introduction

With the advent of the Internet era, the pattern of economic globalization has been further established and e-commerce has further developed. Network trade extends the pattern of traditional trade and opens a new situation of commercial trade. The development of network trade has had a huge impact on the growth of the world economy and trade, and under such influence, China's economy is developing rapidly with the help of network trade, which has a significant impact on China's economic development and also brings a series of challenges. Therefore, in response to the new pattern brought by network trade, new methods should be continuously explored in order to better cope with the challenges.

2. The Connotation of Network Trade

Network trade is a virtual online trading method based on information technology and Internet platform, which achieves the union between enterprises and enterprises, customs, commodity inspection, transportation, finance and taxation and other departments with the help of digitalization and information technology, and realizes the automatic processing of transactions, settlement and other businesses, so network trade is an important part of e-commerce [1]. Network trade has a broad sense and a narrow sense, and the broad sense of network trade is based on two specific types of network trade and paperless trade; while the narrow sense of network trade is limited to the network trade. Network trade has its own unique characteristics. First, network trade has the characteristics of virtualization, in which the traditional real economy is transformed into network trade, and trade is conducted through the network. Second, network trade has the characteristics of globalization, which further expands the time and space of traditional trade, and gets rid of the limitation of time and space as well as geography to form a huge trade market in the global scope. Therefore, network trade has transformed the traditional marketing

**Corresponding Author:*
Bing Han,
Rissho University, Osaki Shinagawa-ku, Tokyo, 141-8602, Japan;
Email: 1158852782@qq.com

 DOI: http://doi.org/10.26549/jfr.v5i2.7710

concept and given rise to a series of new concepts such as the Internet economy.

3. The Impact of Network Trade on the Economy of China (Asia)

(1) Network trade reduces the cost of transactions between buyers and sellers

Through network trade, merchants and consumers can directly use the online trade platform to contact each other, which reduces the intermediate links in the trade activities without going through the traditional trade of offline shopping, and directly saves the cost between buyers and sellers because there are fewer profit-sharers. Moreover, with the help of the Internet and information technology, it greatly saves money and time costs, eliminating the travel and transaction costs of traditional trade activities. And the use of third-party transaction payment mode ensures the safety of consumers' and sellers' funds, which has a protective effect on both merchants' and consumers' funds [2].

Throughout Asia, the global openness of the Internet from country to country has facilitated access to information, reduced the cost of searching the market for each country, and reduced the uncertainty that exists in many transactions. Such a way accelerates the trade between countries and provides the ground for the growth of network trade. The rapid establishment of our country in the Asian capital market through e-commerce and online trade is the key to the emergence of our companies in the international market and the use of the Asian market as a springboard to internationalization.

(2) Network trade breaks the trade restrictions of backward regions

The development of the Internet is characterized by globalization, and with the help of the Internet, every country is able to realize free trade on the network, truly reaching a borderless state. In the Internet shared resources, every country that has access to the Internet is able to use the services provided by the Internet to achieve resource sharing, and under such an information sharing system, it is possible to use the convenient Internet to conduct online transactions, providing unlimited space for trade development [3].

For the development of China's economy, the development of network trade has broken the trade restrictions of backward regions, which enables our enterprises to achieve a wider range of trade with the Internet and also provide more online services after the transaction to do a good job of consumer after-sales protection. It undoubtedly makes the enterprises have a new starting point, and the enterprises have more competitive advantages in the same starting line, which can also better promote the development of the economy [4].

(3) The development of network trade has intensified the competition among enterprises

While network trade brings positive impacts to China's social and economic development, it is also important to recognize the challenges brought by network trade to economic development. In the process of continuous development of network trade, enterprises have to continuously develop overseas markets in order to further enhance the profitability of their operations and reflect their international competitiveness [5]. In this process, because the network trade can provide all-weather transactions and is not limited by time and geography, which allows enterprises to more quickly promote their products to the world. In this process, large enterprises are often able to use their existing heritage to speed up the replication and dissemination of information to enhance the influence of their own enterprises, while for small and medium-sized enterprises, because their own development scale is not large enough, the process of network trade is often affected by their own development scale, and ultimately difficult to emerge in the fiercely competitive market environment.

(4) The development of network trade faces challenges in terms of security

The Internet has the characteristic of invisibility, and the network trade developed based on the Internet also faces the security challenges. Network security is always a common problem faced by all kinds of network economic activities. For enterprises, conducting online trade can have a profound impact on their capital or the development of the enterprise if they suffer from security problems [6]. In the process of network trade, the lack of laws and regulations on security has led to the lack of fundamental protection for network trade, and such a real problem has affected the enthusiasm of enterprises to participate in network trade. Especially for SMEs, SMEs lack the ability to deal with network risks, so they will suffer a considerable blow once they encounter network security problems, thus bringing adverse effects to the development of enterprises.

(5) The development of network trade has higher requirements for talents

In the process of promoting the continuous development of network trade, the positive impact of network trade on China's economy deserves recognition. And to further play the role of network trade in promoting China's economy, it is necessary to pay attention to the value of talent. Currently, the shortage of talent resources in the process of network trade development is increasingly becoming the key to restrict the development

DOI: http://doi.org/10.26549/jfr.v5i2.7710

of enterprises [7]. In the process of network trade, the existing personnel have problems in professional aspects and comprehensive quality, which are difficult to adapt to the development needs of the current international trade environment. From this aspect, the development of network trade for the development of China's economy has also brought a certain negative impact. Only from the root of the problem of talent to further promote the development of our economy, can it better cope with the international trade environment [8].

4. Conclusions

In summary, the rapid development of the Internet and information technology has given birth to network trade, and network trade has broken the time and space restrictions and expanded the scope and area of transactions, which makes various countries and regions have the opportunity to participate in trade activities, thus promoting economic development. Network trade plays an obvious role in promoting China's economic development and has a positive impact on China's economy, but network trade is like a double-edged sword that brings positive impact while also making China's economic development face a series of challenges. Therefore, only by discussing the impact of network trade on China's economic development, can we better seize the opportunity of the times and achieve another economic takeoff with the help of network trade.

References

[1] Liu Pengju. Exploring the impact of online trade on China's economic development [J]. China Minsheng, 2020(02):150.

[2] Zhu Binghui,Wang Yanan. The application and development of network marketing in international trade[J]. Taxation, 2019(07):178-179.

[3] Fu Wei. Discussion on how to improve the development of China's network trade positive strategy [J]. Business Conditions, 2014(49):106-107.

[4] Jin Huan,Song Sainan. The impact of the new network economy on modern enterprises[J]. Knowledge Economy, 2019(09):38.

[5] Zhang Jiayu, Jiang Hongjuan. An analysis of the development of online trade in the new era[J]. Chinese and foreign entrepreneurs, 2013(07):04-05.

[6] Liu Kai, Yang Liu. The development status of network trade in China and countermeasures [J]. Mall Modernization, 2016(02):26-27.

[7] Wang Qingyang. The impact of Internet finance on economic development[J]. Chinese and Foreign Entrepreneurs, 2019(08):25-27.

[8] Lv Menglin. The impact of Internet finance on economic development[J]. Business Conditions, 2019(47):250.

 DOI: http://doi.org/10.26549/jfr.v5i2.7710

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

A Literature Review of the Influence of Commercial Credit on the Efficiency of Enterprise Capital Allocation

Xinxiu Xie Tinghua Liu* Fengjuan Kou

School of Economics, Shandong University of Technology, Zibo, Shandong, 255012, China

ARTICLE INFO

Article history
Received: 5 August 2021
Revised: 15 August 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Real economy
Capital allocation efficiency
Commercial credit

ABSTRACT

The real economy is the main body of high-quality development, and the efficiency of capital allocation is an important manifestation of the development of the real economy. Therefore, it is very important to study the efficiency of capital allocation. As a representative of horizontal finance, commercial credit has a significant impact on the improvement of capital allocation efficiency. In view of this, this article combs the literature on commercial credit and capital allocation efficiency from the following aspects: firstly, by studying the literature, combing the literature on the macro-level, micro-level and economic effects of commercial credit; secondly, the measurement method of capital allocation efficiency And the influencing factors are systematically sorted out, and finally sorted out and evaluated the existing literature on the influence of commercial credit on the efficiency of capital allocation.

1. Introduction

The report of the 19th National Congress of the Communist Party of China pointed out that my country's economy has shifted from a stage of rapid growth to a stage of high-quality development. At present, China's economic development has entered the "14th Five-Year Plan" period, and the "14th Five-Year Plan" is a critical period for the comprehensive implementation of high-quality economic development. The real economy is the mainstay of high-quality development, the foundation of a country's economy, the source of wealth, and the foundation of an economic power. The Party Central Committee and the State Council attach great importance to the development and expansion of the real economy, and clearly put forward that "insist on putting the emphasis on economic development on the real economy". Therefore, solidly promoting the high-quality development of the real economy has become an important strategic task for our country. The efficiency of capital allocation is an important manifestation of the development of the real economy. At present, due to the lagging process of marketization, imperfect financial capital market development, and the objective existence of factor price distortions, production factors cannot be optimally allocated among enterprises based on market principles, resulting in enterprise capital allocation Efficiency is far from the state of optimal capital allocation efficiency [1]. In this context, it is of vital practical significance to systematically investigate the factors that affect the efficiency of enterprise capital

**Corresponding Author:*
Tinghua Liu,
School of Economics, Shandong University of Technology, Zibo, Shandong, 255012, China;
Email: haddy1009@163.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

allocation.

Through combing and thinking of frontier research, it is found that there are many factors that affect the efficiency of capital allocation, which are mainly divided into external factors and internal factors. External factors include external capital markets, industry conditions, and government governance levels. Internal influences include company size, information asymmetry and agency issues, internal information structure of the enterprise, and other influencing factors. In the current research, there are few studies on the impact of commercial credit on the efficiency of capital allocation. King and Levine etc. [2,3] pointed out that a sound financial system can reduce transaction costs, improve information asymmetry, and thereby improve the efficiency of capital allocation. Finance is endogenous to the real economy and covers two aspects: vertical finance and horizontal finance. Vertical finance refers to the mechanism by which commercial banks and other financial institutions provide investment and financing services to entity enterprises, and the behavior of entity enterprises providing investment and financing to each other on the basis of commercial credit is a horizontal financial mechanism [4]. Since the operation of the real economy is a three-dimensional dynamic system of labor, products, information technology and funds intersecting vertically and horizontally, it is difficult for the huge commercial transaction system between enterprises to realize the payment of goods at the same time. Buying on credit is a normal phenomenon. Therefore, horizontal finance plays an important role in the development of enterprises. Commercial credit, as a representative of horizontal finance, is the creditor's rights and debt relationships of enterprises based on credit in the transaction process. It is guaranteed by the industry, information technology, and capital associations between entities, and has the advantages of high efficiency, low risk, and low cost. The good operation of commercial credit is particularly critical to improving the efficiency of capital allocation. Therefore, it is very important to study the influence of commercial credit on the efficiency of capital allocation.

2. Research on Commercial Credit

Commercial credit refers to the debt-to-debt relationship formed by delayed payment or advance payment in commodity transactions between enterprises. Meltzer [5] first studied the relationship between corporate commercial credit financing and monetary policy, and found that during a period of monetary policy tightening, small and medium-sized enterprises would use commercial credit financing more often due to the unavailability of bank credit, which was formed indirectly through transactions. Credit redistribution has been implemented to reduce corporate pressure. With this as the beginning, scholars have gradually deepened their research on commercial credit, and their research perspective has gradually changed from a single macro perspective to a macro and micro perspective. The research on commercial credit has also entered a systematic and comprehensive stage.

2.1 Research on the Macro Level of Commercial Credit

The research on the macro level of commercial credit mainly focuses on the relationship with monetary policy, and most of them are based on the monetary transmission mechanism and the credit transmission mechanism.

Under the currency transmission mechanism, scholars have conducted research from the perspective of currency and interest rates. Collins [6] found that there is a weak substitution relationship between commercial credit and currency, but the specific substitution ratio is difficult to measure. Cumby [7] research shows that commercial credit is positively correlated with interest rates, so tightening monetary policy will increase the use of commercial credit, but the correlation is relatively minor. Chen Shenglan and Ma Hui [8] research shows that, compared with low-risk companies, high-risk companies have significantly reduced commercial credit after the loan interest rate ceiling is liberalized, and increase commercial credit significantly more after the loan interest rate ceiling is liberalized.

Under the credit transmission mechanism, it mainly studies the relationship between commercial credit and bank credit, and the research conclusions can be roughly divided into two schools: complementary relationship and substitution relationship. Under the theory of complementarity, Cook's [9] research shows that considerable commercial credit can win higher bank credit for enterprises. Fan Xiaoyun and Dong Erlei [10] studied the influence of commercial credit and bank credit on corporate exports and found that there is a strong complementary relationship between commercial credit and bank credit. The research of Chen Jiyong and Liu Qihao [11] draw the same conclusion, they also found that commercial credit has a promoting effect on bank credit, and the promotion effect is more prominent in state-owned enterprises and other enterprises with strong credit financing capabilities of banks, reflecting the promotion of commercial credit on bank credit in corporate financing "Matthew Effect" on the Internet. Under the substitution theory, Meltzer (1960) first

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

proposed the substitution relationship between the two credit. Nilsen [12] also came to the same conclusion that commercial credit financing is part of the monetary policy credit transmission mechanism. When bank credit resources are scarce, commercial credit financing can be used as an alternative financing channel. Lu Zhengfei and Yang Deming [13] found that when a tightening monetary policy is implemented, alternative financing theory can explain the large number of companies using commercial credit financing. Rao Pingui and Jiang Guohua [14] believe that this substitution relationship will be affected by the nature of property rights, and non-state-owned enterprises have stronger substitution demand. The above research on substitution theory and complementary theory mainly analyzes commercial credit and bank credit as two independent financing channels without paying attention to the possible transformation relationship between the two. The fierce debate between the two theories has also triggered some scholars A new research perspective has been explored: Burkart and Ellingsen [15] believe that the relationship between the two cannot be simply divided into complementarity or substitution, and the specifics should be determined by the company's own conditions. Huang [16] revealed the dynamic conversion characteristics between commercial credit financing and bank credit financing through a theoretical model, and proved that the conversion condition is the productivity level of the enterprise: when the productivity of the enterprise is lower than the average productivity of the whole society, there is a complementary relationship between the two ; When it is higher than the average productivity of the whole society, it shows a substitution relationship. Wu Na et al. [17] based on the theory of signal effects, using the diminishing and distorting signal effects as the reasoning logic, and using the panel threshold model to prove that the two present a secondary structural mutation relationship of substitution-strong complementarity-weak complementarity. Xu Yaozhi and Hua Ying [18] studied the dynamic conversion relationship between commercial credit and bank credit based on the perspective of supply chain relations. The study found that with the increase of supplier concentration, the transition from substitution effect to complementary effect appeared, and at the same time, with the increase of customer concentration, the structural mutation characteristics from substitution relationship to complementary relationship and then to substitution relationship appeared.

2.2 Research on the Micro Level of Commercial Credit

The micro level mainly focuses on the study of motivation of use. According to the existing literature, commercial credit use motives can be divided into two categories: business motives and financing motives.

Operational motives refer to the behavioral response of an enterprise based on changes in market conditions in order to reduce costs, expand sales, and slow down fluctuations in market supply and demand so as to achieve the goal of maximizing profits. Operational motives mainly include promotion, price discrimination, reducing transaction costs, and ensuring product quality. The first two stand from the perspective of commercial credit providers (that is suppliers). The motivation for promotion is that manufacturers provide customers with commercial credit for a certain period of time to stimulate customers' desire to buy and increase sales and profits. The research of Schwartz [19] shows that commodities with credit clauses are equivalent to selling at a reduced price, which can achieve the effect of promotion, which is beneficial for enterprises to win in the competition. In addition, bank loans have obvious credit discrimination and scale discrimination, and companies with financing difficulties have to use commercial credit to ease financing constraints. The research of Brennan et al. [20] found that although sellers set a uniform selling price on the surface, they provide buyers with low willing prices with commercial credit that allows them to postpone payment, and realize price discrimination through indirect selling at the price. The latter two stand from the perspective of commercial credit recipients (that is, the enterprise itself). The motivation to reduce transaction costs is because commercial credit allows buyers and sellers to return uncertain currency expenditures to a precise time, improving the efficiency of both parties' capital utilization and reducing both parties' transaction cost. Ferris [21] found that when commercial credit is not used, companies must keep a large amount of cash to deal with uncertain material purchases, which incurs high cash management costs. After commercial credit is used, regular payments are predictable and manageable. It can reduce unnecessary cash idleness and reduce management costs. In fact, for suppliers, regular cash inflows also reduce their management costs. The motivation for quality assurance is that the use of commercial credit is similar to a guarantee mechanism. After the transaction is completed, if the product has quality problems, the payment can be refused. At the same time, it also serves as a signal to the manufacturer that provides commercial credit, which helps the manufacturer. Increased credibility.

The mainstream theories of financing motives include financing comparative advantage theory and credit rationing theory. The theory of comparative advantage

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

in financing believes that suppliers have the advantage of obtaining information due to business exchanges between enterprises, that is, the two parties participating in the transaction have more information about each other and can effectively overcome information asymmetry [22]. Suppliers also have strong control advantages [23] and property recovery advantages (Petersen and Rajan, 1997), that is, suppliers can stop supply or use existing the sales network deals with goods to reduce the risk of default and costs. Therefore, compared with bank credit, commercial credit has a comparative advantage. The two scholars made a systematic and comprehensive summary of the comparative advantage theory of financing, and most of the subsequent related researches are based on these theories. Credit rationing theory believes that the information asymmetry between banks and enterprises will cause problems such as adverse selection and moral hazard. Stiglitz and Weiss [24] believe that there are multiple types of borrowers in the market. For large companies, on the one hand, a sound financial disclosure system reduces the information asymmetry between banks and enterprises. On the other hand, a large number of mortgage-backed assets reduces moral hazard and can often obtain bank credit; while small business borrowers even if they are willing to pay high borrowing interest rates may also be excluded from the credit market due to information asymmetry.They can only find another source of financing and use commercial credit as an alternative financing channel to ease financing constraints.

2.3 The Economic Effect of Commercial Credit

As a component of short-term financing, commercial credit does not require collateral guarantees and the participation of third-party intermediaries. It has become the "third financing channel" alongside direct securities financing and bank indirect financing. When companies face the problem of financing difficulty and high financing cost, they can use alternative financing channels such as commercial credit financing to alleviate the financing constraints they face [25]. Through quantitative analysis, Shi Xiaojun and Zhang Shunming [26] found that commercial credit can alleviate corporate financing constraints. This is because companies with high commercial credit can make full use of the financing effects of accounts receivable and accounts payable, and increase their financing channels in disguise. The research of Lan Yanze and Wei Yidan [27] found that as a financing method, commercial credit can alleviate the financing constraints of private enterprises; financial association and commercial credit are alternative, that is, both can alleviate the financing difficulties of private enterprises. However, under the premise of establishing financial linkages, the effect of commercial credit in alleviating financing constraints is weakened. In addition, because commercial credit can reduce the information asymmetry between enterprises, creditors can better supervise enterprise investment decisions, reduce default risks (Smith,1987), and promote investment efficiency. Sun Puyang et al. [28] found through empirical research that the higher the financing cost of the formal sector, the more prominent the problem of corporate financing constraints, and the more commercial credit can promote corporate investment. The research of Liu Eping and Guan Jingyi [29] shows that the increase in commercial credit can restrain the over-investment of enterprises, play a role in debt governance, and at the same time alleviate the problem of under-investment in enterprises, thus realizing the function of two-way governance. Liu Huan [30] empirically discussed the role of business credit in corporate governance. The research found that the larger the scale of a company's business credit, the higher its investment efficiency. Compared with a company with a higher market position, business credit invests in a company with a lower market position. The effect of improving efficiency is more obvious. Finally, the use of commercial credit can adjust the capital structure, optimize resource allocation, and promote corporate performance (Ferris, 1981). Ying Qianwei [31] verified the use of commercial credit financing through data to have a significant positive effect on the development of enterprises, and the more serious the financing difficulties faced by financing enterprises, the more obvious the positive effect of this method. From the perspective of commercial credit financing as an alternative financing method of bank credit financing, although commercial credit financing can promote the improvement of corporate performance, research has found that its promoting effect is weaker than the positive effect of bank credit. However, some studies have come up with different conclusions. Zhang Liang and Ma Yongqiang [32] show that inefficient investment plays a U-shaped intermediary role between business credit and corporate performance. The acceptance of moderate commercial credit can effectively promote investment and benefit corporate performance; however, too little or excessive use of commercial credit may cause problems such as aggravating corporate financial difficulties or aggravating the blind use of corporate cash flow, resulting in low corporate investment efficiency.

3. Research on the Efficiency of Capital Allocation

3.1 Resource Allocation Efficiency

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

Resources are the sum of human, material and financial resources in social and economic activities, and are the basic material conditions for social and economic development. With the continuous development of the economy and society, people's needs are increasing day by day, and resources are showing relative scarcity, so they must be reasonably allocated. Resource allocation is the selection of relatively scarce resources for different purposes. Generally speaking, if resources can be reasonably allocated, economic benefits will increase significantly; otherwise, economic benefits will decrease. The classical economist Adam Smith first proposed the concept of resource allocation. Its core point is: the market, the "invisible hand", will spontaneously guide the flow of resources from low-efficiency industries to high-efficiency industries. The configuration of the company has given impetus to social development. Neoclassical economists further proposed under the assumption of "economic man" and "rational choice" behavior that only in a perfectly competitive market environment can the optimal allocation of resources be achieved. Modern economics believes that the market is the most important way of resource allocation, and the capital market plays an extremely critical role in the allocation of resources. In this process, capital first flows to enterprises and various industries through the capital market, and then drives human resources, etc. Factors flow to enterprises, which in turn promotes the development of enterprises and industries. The issue of efficiency was first raised by Frederick Taylor, the father of management, who believed that high efficiency is the basis for employees and employers to achieve common prosperity. Efficiency is the description of the state of resource allocation. It is divided into two levels according to the different subjects of the investigation: one is efficiency in a narrow sense, that is, production efficiency: it refers to the difference between the actual output and the maximum output of a production unit or department under a fixed amount of input. The second is efficiency in a broad sense, that is, the efficiency of resource allocation: it refers to how to allocate limited economic resources among different entities and guide resources to flow into enterprises or industries with high return rates.

The efficiency of resource allocation can be divided into three levels: macro resource allocation efficiency, meso resource allocation efficiency, and micro resource allocation efficiency according to different allocation subjects. Among them, the efficiency of macro resource allocation is to evaluate the allocation efficiency level of a country or economic region from the perspective of society as a whole. The main body of allocation is the entire country or the capital market, that is, the capital market allocates resources among different industries and different regions; medium resources The main body of allocation efficiency is to focus on a specific area, emphasizing the allocation of resources within the region; while the research object of micro-resource allocation efficiency is aimed at individual units, emphasizing the allocation of resources of each subject in the industry, such as enterprises placing capital in The allocation between investment projects. High-efficiency micro-resource allocation efficiency enables companies to efficiently allocate limited internal resources, make reasonable investments, avoid inefficient investments such as over-investment and under-investment, so as to achieve capital circulation and capital appreciation. This paper mainly studies the efficiency of micro resource allocation, that is, the efficiency of enterprise capital allocation.

3.2 The Measurement Method of Capital Allocation Efficiency

There are three main ways to measure corporate capital allocation efficiency commonly used in the literature, Wurgler [33] model, Richardson [34] model, and investment sensitivity to Tobin's Q model [35]. The quantitative capital allocation efficiency model established by Wurgler (2000) mainly measures the response of capital investment to capital returns. If the investment response coefficient is positive and the data is larger, it indicates that the enterprise allocates internal resources more efficiently. On the basis of this model, domestic scholars made appropriate changes to the model based on the specific conditions of Chinese enterprises. Fang Junxiong [36] improved on the basis of the Wurgler model, replacing capital investment with the original value of fixed assets at the end of the year, and replacing the value-added realized by the industry with industrial value-added rate and sales gross margin. Chen Yanli et al. [37] also improved the Wurgler model, using the average net profit per share of related industries to measure corporate efficiency, and measuring the efficiency of capital allocation by the sensitivity between net profit per share and the chain ratio of assets per share. Since the choice of independent variables in the model is diversified and subjective, the appropriateness of this measurement method is still open to question. The Richardson (2006) model was originally proposed to measure the efficiency of corporate investment. Therefore, scholars later used the Richardson model to measure the efficiency of capital allocation, which was described by the indirect method of substitution variables. Liu Guangrui et al. [38] used the Richardson model to study the relationship between

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

financial development, informal finance and the efficiency of corporate capital allocation. Yang Zheng et al. [39] used the Richardson model to study the impact of the advancement of interest rate marketization on corporate inefficient investment and corporate capital allocation efficiency. Some scholars also use the marginal Tobin Q model to measure the efficiency of capital allocation. For example, Yang Jinzhi et al. [40] use investment opportunities as a measurement standard to study the allocation efficiency of the group's internal capital market. Shao Yiping and Yu Fengfeng [41] use Tobin's Q as a substitute variable, and then observe whether the value of the enterprise has been promoted as a criterion for measuring the effectiveness of capital allocation. Zhang Xinmin and Zhang Tingting [42] also used the sensitivity of corporate investment to Tobin's Q to measure the efficiency of corporate capital allocation. It is not very accurate and scientific to measure the efficiency of capital allocation only by substitute variables. However, because some of the information disclosure of Chinese enterprises is not perfect, it is difficult to measure the efficiency of allocation by direct indicators. Therefore, most domestic literature still uses substitute variables for research.

3.3 External Factors Affecting the Efficiency of Capital Allocation

The impact of external capital markets on the efficiency of internal capital allocation

First, the contractability of the external market and the scale of capital allocation affect the efficiency of internal capital allocation: when the degree of contractualization of the external capital market is low and the scale of capital allocation is small, the efficiency of internal capital allocation is higher. With the increase in the contractualization of the external market and the expansion of the scale of capital allocation, the advantages of resource allocation through the external capital market have become more prominent. Secondly, the perfection of the financial capital market will also affect the efficiency of corporate capital allocation. A study by Beck and Levine [43] shows that the development level of the financial market and the efficiency of corporate capital allocation will show a positive correlation, that is, the more perfect the financial market, the more efficient the corporate capital allocation high. Zhang Qingjun and Li Meng [44] found that the level of financial market development and the efficiency of corporate capital allocation will show a positive correlation, that is, the more perfect the financial market, the higher the efficiency of corporate capital allocation. Fan Hongzhong and Wang Yujie [45] found that the introduction of short-selling as a governance mechanism can effectively alleviate the company's internal principal-agent problem, reduce the information asymmetry between the company and the external capital market, reduce the company's financing costs, and thereby overall Improve the efficiency of corporate capital allocation. In addition, the level of marketization will also affect the efficiency of corporate capital allocation. Xu Weiping and Qin Fengfeng [46] have shown that the process of marketization has significantly improved the situation of capital misallocation and further optimized capital allocation. That is, the process of marketization will promote the flow of less efficient resources from regions to more efficient places. The higher the level of marketization, the higher the efficiency of corporate capital allocation. Han Linjing [47] found that financial marketization did not bring about the improvement of investment efficiency. With the improvement of financial marketization, state-owned manufacturing enterprises received more loan support, but at the same time it also brought pressure from government intervention investment. The efficiency has not been significantly improved. State-owned manufacturing enterprises' excessive encroachment on credit resources also drags down the investment efficiency of non-state-owned manufacturing enterprises, resulting in a phenomenon of "double efficiency loss". The level of external financing costs not only affects the scale of external financing of the company, but also affects the rent-seeking behavior and intensity of department managers. High external financing costs will change the rent-seeking efforts of department managers, resulting in inefficient internal capital allocation [48].

The impact of industry conditions on the efficiency of internal capital allocation

When faced with unfavorable industry impacts, the company uses a large amount of internal capital to "subsidies" the sector. At this time, it is not based on the investment opportunities of various sectors as the resource allocation standard. In this way, these affected departments can be prevented from closing down and withdrawing from the industry, and avoiding the impact of adverse changes in the industry on the company's profit and loss. If the company invests a large amount of internal "subsidies" on projects with negative net present value, it may lead to over-investment in these sectors, and the company value will therefore decrease [49]; and when the industry situation gradually improves, the company withdraws internal "Subsidies" will increase the value of the company.

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

The impact of the level of government governance on the efficiency of internal capital allocation

The research of Qi Huaijin et al. [50] shows that the level of government governance is significantly positively correlated with the efficiency of corporate capital allocation, that is, improving the level of government governance by improving government efficiency and accelerating the process of marketization can significantly improve the efficiency of corporate capital allocation. The research of Li Yonghui [51] shows that the promotion and competition of local government officials will inhibit the efficiency of enterprise resource allocation in the jurisdiction. Compared with non-state-owned enterprises, competition for promotion of local government officials has a more significant inhibitory effect on the resource allocation efficiency of state-owned enterprises in the jurisdiction.

3.4 Internal Factors Affecting the Efficiency of Capital Allocation

Information asymmetry and agency problems

First of all, information asymmetry and agency problems based on the theory of separation of two rights are hot issues in management research. Information asymmetry and agency problems can lead to misalignment of corporate asset investment and low capital allocation efficiency. The agency cost problem of internal capital allocation mainly comes from the agency problem between large shareholders and small and medium shareholders, and between shareholders and company management.

(1) Agency issues at the ownership level formed between large shareholders and small and medium shareholders

In countries where the legal protection of investors is relatively weak, the agency problem among shareholders is more serious, and inefficient internal capital allocation is often related to agency problems at this level. In countries where the law provides weak investor protection, the transparency of the external capital market is low, and it is difficult for external small and medium shareholders to supervise the company, and large shareholders and company management are prone to plunder the company's wealth for their private gains. The purpose of constructing enterprise groups is also that controlling shareholders use the pyramid ownership structure to encroach on the interests of small and medium shareholders [52]. Xu Lei and Zhang Xiangjian [53] found that major shareholders can obtain hidden benefits that small and medium shareholders cannot obtain in the process of equity refinancing through profit manipulation. The benefits of major shareholders increase with the increase in the degree of profit manipulation, and the increase in the degree of profit manipulation will reduce the capital allocation efficiency and corporate value of listed companies. Dou Zhongqiang et al. [54] analyzed the impact of private gains of control on corporate capital allocation decisions based on the theoretical interpretation of corporate internal capital allocation. The results of the study show that the private behavior of controlling rights of major shareholders is an important reason that causes companies to deviate from the optimal capital allocation decision.

(2) Agency issues between shareholders and company management

The principal-agent relationship in the West is drawn under the background of "weak owners and strong managers". The agency problem between shareholders and management is the main agency problem. Companies with internal capital markets usually have more cash flow, giving managers more internal capital at their disposal. When the management allocates internal capital, it will lean toward the "pet projects" in their hands, such as investing internal capital in projects that can increase their private income or not increase shareholder wealth, and other projects that have a negative net present value. The external market's supervision of internal capital allocation behavior is weak, and excessive investment may occur, which may lead to distortions in internal capital allocation. Stein [55] found that under the conditions of a certain level of investment and limited capital, when the management's own interests are consistent with the company's overall interests, the management may carry out effective internal capital allocation; and when the management's own interests are in line with the company's overall interests When the overall interests are inconsistent, the management is prone to inefficient internal capital allocation behaviors in order to pursue their own interests, which damages the interests of shareholders.

Enterprise accounting information quality

Improving the quality of accounting information can indirectly improve the efficiency of corporate capital allocation by reducing the information asymmetry between investors and management, investors and the company. Chinese scholar Li Qingyuan [56] also found that improving the quality of accounting information can effectively reduce agency risk and adverse selection, increase corporate investment efficiency, reduce corporate financing costs, and improve corporate capital allocation efficiency. In addition, high-quality accounting information sends a positive signal to the market, and stakeholders can respond accordingly to reduce inefficient investment of company capital. From the perspective of the institutional environment, Zhang Botao [57] found that high-quality accounting information can

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

effectively improve the capital allocation efficiency of listed companies, and the capital allocation efficiency of listed companies in areas with better institutional environments is significantly higher, that is, a good institutional environment can Promote the quality of accounting information to exert a greater positive impact on the efficiency of capital allocation of listed companies.

Enterprise internal information structure

In the internal capital market, by setting up complex levels, the headquarters can obtain real information about departmental investment projects under the premise of maintaining control rights, and can allocate internal capital more efficiently, meet its own capital needs, and make high-quality investments. decision making. Compared with external investors, the headquarters has a better understanding of project-related information and can effectively allocate internal capital to departments with the highest marginal returns. Through internal capital allocation, the company invests limited funds into projects with a higher rate of return, eases financing constraints, and creates greater value for the company [58]. When the internal information structure of the enterprise is more standardized and the information transmission is more accurate, the more effective the CEO will allocate internal capital based on the information obtained, and the efficiency of internal capital allocation will increase accordingly.

Other influencing factors

There are other factors that also affect the efficiency of internal capital allocation, such as the size of the company, the level of corporate governance, and the level of foreign direct investment. When the company reaches a certain size, the existence of the internal capital market can relax financing constraints and promote efficient internal capital allocation. However, as the company continues to grow in size and with the increase in levels, the company's internal agency chain is extended, and internal information transmission is not smooth. Information is distorted and the function of observation and control of the headquarters is weakened. It is difficult for the headquarters to effectively perform its supervisory functions, resulting in ineffective internal capital allocation. Therefore, the larger the size of the company, the larger the internal capital market, and the more likely it is to distort the internal capital allocation [59]. In addition, the level of corporate governance also has a significant impact on the efficiency of capital allocation. The existing literature on the impact of corporate governance on the efficiency of corporate capital allocation is mainly in two aspects: on the one hand, it is about the impact of the overall corporate governance mechanism on capital allocation. Governance mechanism is conducive to reducing agency problems, reducing information asymmetry, reducing tunneling, etc., which is conducive to the improvement of corporate capital allocation efficiency [60]; on the other hand, the research mainly focuses on the degree of equity concentration and independent directors. The impact of some governance mechanisms such as the ratio and the degree of separation of the two powers on the efficiency of corporate capital allocation [61,62]. In recent years, the literature on OFDI's impact on the efficiency of corporate capital allocation has also increased. Studies have shown that companies' blind and extensive or follow-up OFDI behavior is not only detrimental to the improvement of corporate capital allocation efficiency, but will instead cause companies to fall into high-quality assets or even investment. In the dilemma of failure, Bai Junhong and Liu Yuying [1] found that OFDI's important mechanism for improving the efficiency of capital allocation is to allow production factors to flow freely between different countries (borders), and capital can use OFDI to search for profits on a global scale. Maximize the allocation method, and then realize the improvement and promotion of the efficiency of enterprise capital allocation.

4. Research on the Relationship between Commercial Credit and Capital Allocation Efficiency

There are few articles on the influence of commercial credit on the efficiency of corporate capital allocation. Chen Deqiu et al. [63] selected a sample of Shanghai and Shenzhen listed companies from 2002 to 2010. The study found that the stronger the commercial credit obtained by the family business, the higher the efficiency of corporate capital allocation, and this effect is more significant in areas with higher social trust. Further research found that the micro-mechanism of the capital allocation efficiency of commercial credit is to alleviate the enterprise's insufficient investment and improve investment efficiency. That is, commercial credit helps companies with restricted formal financing channels to improve the efficiency of capital allocation by providing informal financing opportunities. Liu Guangrui [38] took my country's listed real estate companies from 2007 to 2011 as a sample, and used the Richardson model to measure the efficiency of corporate capital allocation. He studied the impact of financial development and informal finance on the capital allocation efficiency of real estate companies. The study found that listed private real estate companies over-investment is more serious than listed state-owned

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

real estate companies, and the phenomenon of under-investment in state-owned real estate listed companies is more obvious. Informal finance based on commercial credit can improve the capital allocation efficiency of private real estate listed companies and state-owned real estate listed companies. Zhang Xinmin and Zhang Tingting [42] used the data of A-share listed companies in the Shanghai and Shenzhen stock exchanges from 2008 to 2013, and used the sensitivity of investment to Tobin's Q to measure the efficiency of capital allocation. The results showed that the stronger the business credit obtained by the company, the more efficient the company's capital allocation. The higher, that is, commercial credit can improve the efficiency of the enterprise's capital allocation. Further research found that the impact of commercial credit on the efficiency of corporate capital allocation differs depending on the nature of the property rights of the enterprise and the degree of regional financial development. The effect of commercial credit on the improvement of capital allocation efficiency is in private enterprises and enterprises in relatively underdeveloped financial markets. Is more significant.

5. Conclusions

To sum up, there have been many articles that have individually studied commercial credit and capital allocation efficiency, but there are few studies on the impact of commercial credit on the efficiency of corporate capital allocation, and there are the following problems: First, provide commercial credit in the course of business operations. Credit to obtain more sales revenue is the primary starting point for enterprises to use commercial credit. Providing commercial credit can not only reduce the financing cost of enterprises by giving full play to the signal effect, but also increase the level of production efficiency and enhance the competitiveness of enterprises' products. The impact on the efficiency of capital allocation cannot be ignored. However, the existing literature only analyzes from the perspective of commercial credit, and lacks research on the impact of commercial credit provision on the efficiency of capital allocation. Second, there is an endogenous problem in the process of commercial credit influencing the efficiency of corporate capital allocation. There have been few studies to control this problem, causing certain biases in the research results. Third, there are few studies on the theoretical mechanism analysis and intermediary effect testing of how commercial credit affects the efficiency of corporate capital allocation. Zhang Xinmin and Zhang Tingting [42] only analyzed the mechanism from the perspective of obtaining commercial credit to ease financing constraints. In view of the above analysis, this article believes that future research can start from the following aspects: First, include the provision of commercial credit variables into the article discussion, increase the research on the impact of commercial credit provision on the efficiency of capital allocation, and enrich the research content. Second, a more systematic and comprehensive analysis of the theoretical mechanism of how commercial credit affects the efficiency of corporate capital allocation. Third, to further demonstrate the impact of commercial credit on the efficiency of corporate capital allocation through empirical research. The process of demonstration needs to be rigorous, multi-angled, and comprehensive, and control possible endogenousness in the research process.

Funding

We are grateful for the financial support from Surface Project of "Nature Science Found of Shandong Province" (Project Title: Trade credit and TFP of Shandong Manufacturing Enterprises: a Study from the Perspective of Enterprises and Clusters, No. ZR2020MG037); Key Project of "Shandong University Humanities and Social Sciences" (Project Title: the Mechanism of Trade Credit Influencing Technological Innovation: an Empirical Study of Shandong Enterprises, No. J17RZ005);Surface Project of "Social Science Found of Shandong Province" (Project Title: Study on the Mechanism of Informal Finance Promoting Innovation in Shandong Province, No.19CJJJ23).

References

[1] Bai Junhong, Liu Yuying. Can foreign direct investment improve China's resource misallocation[J]. China Industrial Economics, 2018(01): 60-78.

[2] King R G, Levine R. Finance and growth: schumpeter might be right[J]. The Quarterly Journal of Economics, 1993,108(3):717-737.

[3] Levine R. Law,finance,and economic growth[J].Journal of Financial Intermediation, 1999,8(1):8~35.

[4] Wang Guogang. The focus of China's financial reform and development during the 14th Five-Year Plan period [J]. China Finance, 2020(Z1): 156-158.

[5] Meltzer,A.H. Mercantile Credit, Monetary Policy and Size of Firms[J]. The Review of Economic and Statistics,1960,42(4):429-437.

[6] Collins, M. Monetary Policy and the Supply of Trade Credit: 1830-1844[J].Economica, 1978,45:379-389.

[7] Cumby, R. E. Trade Credit, Exchange Controls, and Monetary Independence: Evidence From the United Kingdom[J]. Journal of International Economics, 1983, 14:53- 57.

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

[8] Chen Shenglan, Ma Hui. Loan availability and corporate commercial credit: Quasi-natural experimental evidence of China's interest rate marketization reform[J]. Management World, 2018, 34(11): 108-120+149.

[9] Cook,L.D. Trade Credit and Bank Finance: Financing Small firms in Russia[J]. Journal of Business Venturing,1999,14(5-6):493-518.

[10] Fan Xiaoyun, Dong Erlei. Bank Credit, Commercial Credit and Enterprise Export——An Empirical Analysis Based on Simultaneous Equation Model [J]. China Economic Issues. 2015(01).

[11] Chen Jiyong, Liu Qihao. An Empirical Study on the Impact of Commercial Credit on Bank Credit[J]. Finance and Trade Research, 2015, (4): 88-95.

[12] Nilsen. Trade Credit and the Bank Lending Channel[J]. Journal of Money, Credit and Banking. 2002, (34): 227-253.

[13] Lu Zhengfei, Yang Deming. Commercial Credit: Alternative Financing, or Buyer's Market? [J]. Management World, 2011(4): 6-14.

[14] Rao Pingui, Jiang Guohua. Research on the Influence of Monetary Policy on the Interaction between Bank Credit and Commercial Credit[J]. Economic Research, 2013, (1): 68-82.

[15] Mike Burkart, Tore Ellingsen. In-Kind Finance[J]. Fmg discussion papers, 2002, 94(3):569-590.

[16] Huang,H.,Shi,X.,Zhang,S..Counter-cyclical Substitution between Trade Credit and Bank Credit.Journal of Banking&Finance,2011,35(8):1859-1878.

[17] Wu Na, Yu Bo, Sun Lijun. Multiple structural mutations of commercial credit financing and bank credit financing——analysis of nonlinear relationship based on panel threshold [J]. Nankai Management Review, 2017, (4): 73-81.

[18] Xu Yaozhi, Hua Ying. Research on the dynamic relationship between commercial credit and bank credit from the perspective of supply chain[J]. Finance and Economy, 2021, {4}(02): 4-10.

[19] Schwartz R.A. An Economic Model of Trade Credit[J]. Journal of Financial and Quantitative Analysis, 1974, 9(4):643-657.

[20] Brennan M J, Miksimovic V, Zechner J. Vendor Financing[J]. Journal of Finance, 1988, 43(5):1127-1141.

[21] Ferris, J. S.A Transactions Theory of Trade Credit Use[J]. The Quarterly Journal of Economics, 1981(2):243-270.

[22] Petersen MA, Rajan R G. The Benefits of Lending Relationships: Evidence from Small Business Data[J]. The Journal of Finance, 1994, 49(1):3-37.

[23] Petersen,M.A and Rajan,R.G.Trade Credit:Theories and Evidence[J].Review of Financial Studies,1997,10(3):661-691.

[24] Stiglitz J E, Weiss A. Credit Rationing in Markets with Imperfect Information[J]. American Economic Review, 1981, (3):393-410.

[25] Thomas J. Chemmanur, Paolo Fulghieri. Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt[J]. The Review of Financial Studies,1994,7(3).

[26] Shi Xiaojun, Zhang Shunming. Commercial Credit, Financing Constraints and the Effect of Efficiency[J]. Economic Research, 2010(01).

[27] Lan Yanze, Wei Yidan. The impact of financial association and commercial credit on corporate financing constraints: an empirical study based on private listed companies in my country [J]. Business Economics Research, 2019(03): 163-166.

[28] Sun Puyang, Li Feiyue, Gu Lingjun. Whether commercial credit can be an effective financing channel for enterprises——an analysis based on investment perspective[J]. Economics (Quarterly), 2014, 13(04): 1637-1652.

[29] Liu Eping, Guan Jingyi. Two-way Governance of Commercial Credit to Enterprise Inefficient Investment[J]. Management Science. 2016(06): 131-144.

[30] Liu Huan. Market Position, Commercial Credit and Enterprise Investment Efficiency [J]. Journal of Central University of Finance and Economics, 2019(01): 51-66. Ferris, 1981).

[31] Ying Qianwei. Financial development, commercial credit financing and corporate growth: Empirical evidence from China's A-share listed companies [J]. Economics and Management Research, 2013(09): 86-94.

[32] Zhang Liang, Ma Yongqiang. Can commercial credit improve corporate performance?——Based on the empirical study of inefficient investment mediation effect and organizational redundancy adjustment effect[J]. Investment Research, 2016, 35(02): 59-77.

[33] Wurgler J. Financial Markets and The Allocation of Capital[J]. Journal of Financial Economics, 2020,58(1):187-214.

[34] Richardson S. Over-investment of Free Cash Flow[J]. Review of Accounting Studies,2006,11(2):159-189.

[35] McLean R D, Zhang T, Zhao M. Why does the law matter? Investor protection and its effects on investment,finance,and growth[J].The Journal of Finance,2012,67(1): 313-350.

[36] Fang Junxiong. The process of marketization and the improvement of capital allocation efficiency[J]. Eco-

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

nomic Research, 2006(05): 50-61.
[37] Chen Yanli, Qiao Fei, Sun Heyuan. Economic Consequences of Enterprise Group Internal Transactions from the Perspective of Resource Allocation Efficiency: Empirical Evidence from China's Capital Market [J]. Accounting Research, 2014(10): 28-35.
[38] Liu Guangrui, Yang Hanming, Zhang Zhihong. Financial development, informal finance and capital allocation efficiency of real estate enterprises[J]. Investment Research, 2014, 33(08): 71-84.
[39] Yang Zheng, Liu Fang, Li Mangmang. Interest rate marketization, inefficient investment and capital allocation: a natural experiment based on the cancellation of the upper and lower limits of loan interest rates by the People's Bank of China [J]. Financial Research, 2017(05): 81-96.
[40] Yang Jinzhi, Sun Jian, Lu Chuang. The existence and efficiency of the internal capital market of enterprise groups[J]. Accounting Research, 2010(4): 50-56.
[41] Shao Yiping, Yu Fengfeng. Research on Internal Capital Market, Related Party Transactions and Company Value——Based on the Empirical Analysis of Listed Companies in my country [J]. China Industrial Economics, 2012(4): 102-114.
[42] Zhang Xinmin, Zhang Tingting. Credit discrimination, commercial credit and capital allocation efficiency [J]. Economics and Management Research. 2016, 37(04): 26-33.
[43] Beck T and Levine R. Industry Growth and Capital Allocation: Does Having a Market or Bank-based System Matter? Journal of Financial Economics, 2002.
[44] Zhang Qingjun, Li Meng. Financial development, credit mismatch and corporate capital allocation efficiency [J]. Research in Financial Economics, 2018, 33(04): 3-13.
[45] Fan Hongzhong, Wang Yujie. The impact of short-selling mechanism on the efficiency of capital allocation of listed companies: a quasi-natural experimental study based on the margin trading system[J]. Financial Development Research, 2019(10): 70-78.
[46] Xu Weiping, Qin Fengfeng. The influence of marketization process on capital misallocation——Based on the perspective of industry[J]. Industrial Technology Economy, 2015, 34(10): 91-98.
[47] Han Linjing. The mystery of financial marketization and the efficiency of capital allocation: Based on the perspective of financing constraints of innovative manufacturing companies[J]. Financial Theory and Practice, 2018(08): 46-50.
[48] Zou Wei, Qian Xuesong. Financing costs, rent-seeking behavior and internal capital allocation of enterprises[J]. Economic Research, 2005(05): 64-74.
[49] Lamont,O. ,Polk,C. Does diversification destroy value?evidence from industry shocks[J].Journal of Financial Economics,2002,63(1):51-77.
[50] Qi Huaijin, Li Hui, Liu Yanxia. Government Governance, State-owned Enterprise Mixed Ownership Reform and Capital Allocation Efficiency [J]. Reform, 2019(7): 40-51.
[51] Li Yonghui. The promotion of local officials and the efficiency of enterprise resource allocation: An empirical analysis based on panel data of 397 listed companies in my country [J]. Technoeconomics and Management Research, 2020(02): 13-17.
[52] Wolfenzon D. A theory of pyramidal structures[D]. Harvard University,1999.
[53] Xu Lei, Zhang Xiangjian. Research on Profit Manipulation, Equity Refinancing and Capital Allocation Efficiency [J]. Modern Finance, 2007: 15-19.
[54] Dou Zhongqiang, Liu Xing, Liu Li. Research on Enterprise Capital Allocation Decision under the Private Benefits of Control [J]. Chinese Management Science. 2010 (05).
[55] Stein,J.C. Agency,information and corporate investment[D]. NBER ,Working paper.2001.
[56] Li Qingyuan. Accounting Information Quality and Corporate Capital Allocation Efficiency: Empirical Evidence from Listed Companies in my country [J]. Nankai Management Review, 2009(12): 115-124.
[57] Zhang Botao. The relationship between the institutional environment and the capital allocation efficiency of listed companies[J]. Finance and Accounting Monthly, 2015(17): 9-13.
[58] Stein,J.C. Internal capital markets and the competition for corporate resources[J]. Journal of Finance,1997,52(1):111-133.
[59] Wulf, J. Influence and efficiency in the internal capital market: theory and evidence[R]. Wharton, Working paper, 2000.
[60] Brammer S, Millington A. Does it Pay to Be Different? An Analysis of the Relationship Between Corporate Social and Financial Performance[J].Strategic Management Journal,2008,29(12).
[61] Bates Thomas W. Asset Sales, Investment Opportunities and the Use of Proceeds. Journal of Finance, 2005.
[62] Zhao Qingqing, Liu Chun. Research on the Impact of Corporate Governance Structure on the Efficiency of Internal Capital Markets[J]. Finance and Accounting Newsletter, 2018(33): 49-51+57.
[63] Chen Deqiu, Liang Yuan, Hu Qing. Social trust, family control rights heterogeneity and commercial credit capital allocation efficiency [J]. Contemporary Economic Science, 2014, 36(05): 18-28+124-125.

DOI: http://dx.doi.org/10.26549/jfr.v5i2.7746

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Investigating the Financial Crisis in 2008 from the Perspective of Banking Systems

Tonglei Zhang*

Zhonghuan Information Collage, Tianjin University of Technology, Tianjin, 300380, China

ARTICLE INFO

Article history
Received: 5 August 2021
Revised: 15 August 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Regulation
Mechanism
Shadow bank
Financial crisis
Banking system

ABSTRACT

The financial crisis of 2008 precipitated by credit issues in the US housing market is probably one of the most profound financial events in recorded history. Its shockwaves have significantly affected almost every market centre as well as country in the world. The aim of this report is accordingly to investigate major reasons behind the crisis from a special angle of banking systems. In particular, problems hidden in regulations, mechanisms and systems in the wake of the financial crisis are focused specifically in this report.

1. Brief Introduction

The financial crisis occurred in 2008 resulted in a far-reaching influence on the global economy, and its economic losses were incalculable. At that moment, Andrew W. Lo described this crisis in his research paper as "the worst economic recession so far" [1]. In order to prevent the recurrence of such crisis, numerous researches have been carried out to study the underlying causes of this tragedy since the outbreak of the financial crisis, aiming to find out solutions to improve financial systems as well as regulation mechanisms [2-5]. According to the results given by these researches, one of the primary causes that led to financial crisis was related to the flaws existing in the banking system [6]. The purpose of this report is then to examine the main causes of 2008 financial crisis from a perspective of banking system. Especially, it focuses on studying banking systems of the US, given that the place is where the 2008 financial crisis started to ferment. The report also attempts to analyse the occurrence of incident from four individual aspects which include *Relaxation of Bank Regulation*, *Shadow Banking System*, *Improper Incentive Mechanism under the Banking Systems*, and *Change of Operation Model*. Meanwhile, this report also discusses different functions performed by various financial institutions briefly, so that a clearer understanding of how flaws of banking systems might lead to a global financial crisis could be established.

2. How Failure of Banking System Leads to Financial Crisis

2.1 Relaxation of Bank Regulation

Before 1999, activities and functions provided by

**Corresponding Author:*
Tonglei Zhang,
Zhonghuan Information Collage, Tianjin University of Technology, Tianjin, 300380, China;
Email: yuliazxy@163.com

 DOI: http://doi.org/10.26549/jfr.v5i2.7814

commercial banks in the US were largely restrained due to the implementation of *1933 Glass-Steagall Act*. To reinforce the public's confidence toward these commercial banks, they were then not allowed to use any their deposits to make risky investment at that time [7]. However, with the introduction of *Gramm-Leach-Bliley Act*, the circumstance started to change in 1999. This act not only released the restriction on the commercial banks but also extended their functions [8]. Commercial banks were encouraged to perform some functions of investment banks since then. To take a simple example, commercial banks are able to make investments by using deposits [9].

The implementation of *Gramm-Leach-Bliley Act* indeed provides a series of benefits to the whole banking industry in the US. It brings many developing opportunities for different types of banks. First of all, it enables banks to compete in an international financial market, so that they are able to explore more investment opportunities and maximise their interest [10]. Besides, a much more open investment environment created by the Act gives strong support for banks to carry out risky business activities. For example, investment companies are permitted to make risk assessments by themselves through using computer models [8]. Apart from the introduction of the Act, more loose tax rules and new accounting policies provided further motivation for banks to take risky activities and seek for financial innovations [8]. Followed by the Act and the loosening of financial regulation, an increasing number of banks have been observed to start to make high risk, high return investment in order to achieve maximum benefits.

The loosening of financial market regulations provided conditions and legal support for the commercial banks to undertake the investment activities which motivated them to pursue maximum benefits by lending money to lenders and charging higher level of interests. As a result, in order to pursue higher benefits, a large amount of loans was issued by the banks, yet the banks did not carefully measure the lender's credits and qualifications [11,12]. In addition, the belief of "too big to fail" by banks and policy makers also resulted in an increasing number of risk-taking activities [3,11]. The deregulation of financial markets has accelerated the development of financial market and economic prosperity in the US. However, banks have become increasingly greedy driven by enormous benefits which encouraged banks to take more speculative excess activities and ultimately contributed to the meltdown of financial market in 2008 [5,12].

Despite negative influences brought by the deregulation, it does not mean that the deregulation of the financial market is totally wrong. To prevent a recurrence of financial crisis, some academic scholars argued that it seemed necessary to re-execute the previous strict regulations on the financial markets [13]. However, in fact, over-strict regulation on the financial market is unlikely to lead a good result either, since it may restrict the economic development to a certain extent. Therefore, an appropriate supervision and reform should be carried out to maintain the balance of regulatory structure [13].

2.2 Shadow Banking System

The deregulation of the financial market has contributed to the development of the shadow banking system. Lehman Brothers is a typical example of the financial institutions under such system. These financial institutions, headed by Lehman Brothers, are not quite similar to the traditional banks [14]. They performed more like an intermediate between borrowers and lenders. They held non-traditional activities and offered more innovative financial products such as options, futures and swaps. They often supply risky financial products but with high return. Compared with the traditional financial institutions, these financial institutions are subject to fewer regulations [2,15]. In the past, some economists have claimed that free market environment enables these institutions to make optimal decisions. However, some economists indicated that the activities conducted by these financial institutions are too risky and are less likely to be performed successfully. This argument is later retorted, and supporters stated that the risky activities can be managed by professionals [15]. Surprisingly, the 2008 financial crisis proved that this argument is too idealistic.

Except for the deregulation, inherent flaws associated with the financial institutions under shadow banking system were another important inducement. These financial institutions are lack of stability and are vulnerable to the fluctuation of the market compared with traditional financial institutions [14,15]. As they did not hold the deposits, a sudden pullback by investors or assets depressions would cause a huge impact on them. With the significant growth of these financial institutions in 2007, some of the internal problems became increasingly clear. Combined with less financial regulations, the global financial system eventually collapsed with a growing number of the default of the borrowers on their mortgages [14].

However, the prevalence of shadow bank system was not only due to a lack of enough regulations and expansion of financial institutions' desires, expectation of investors for seeking high return securities, but also was created by a lot of pressures on financial institutions which contributed to the expansion of such phenomena [15]. Those financial products with high return supplied

DOI: http://doi.org/10.26549/jfr.v5i2.7814

by the financial institutions under shadow bank system are still in high demand in the market, despite the fact that these investments are associated with high risks [15]. To change and lead the circumstance to the right path, it is not enough to depend on regulations only. Some innovative reforms and measures are also needed to further standardise the activities of financial market.

2.3 Improper Incentive Mechanism Under the Banking Systems

The improper incentive mechanism designed for the industry insiders is also perceived as a key inducement for the financial crisis [16]. The chairman of Financial Service Authorities revealed in an interview that the improper incentive mechanism induced a series of inappropriate activities and ultimately led to the tragedy [17]. This statement is also consistent with the investigation conducted by the US Financial Crisis Inquiry Commission (FCIC). According to the results of investigation, the collapse of Lehman partially was attributed to the flaws of its inside governance system [18]. The incentive mechanism of the company toward the executives was primarily focused on the short term, which further encouraged the speculative behaviour. To make matters worse, the composition of these executives was not reasonable and appropriate. They are found to come from a variety of financial institutions, like, futures company, insurance company and securities company etc., apart from commercial banks and investment banks [18,19].

To take an example of service fee charged by the financial institutions, Lehman, these fees are the result of mortgage securitisation. In mortgage securitisation, mortgage brokers sell loans to investment bankers, and then the investment banks packaged these loans into securities. Ultimately, these securities need an approval by rating agencies. Since these fees are less likely to be reclaimed in any case, even if these securities may cause huge losses in the future. As a consequence, individuals working inside the financial institutions have strong incentives to increase the number of loans supplied by the banks. However, the loans are issued easily without strict examination, and some key approval processes and requirements are deliberately omitted [4,16].

The report published by Financial Times has showed that the amount of mortgage has experienced significant growth from 2003 to 2008 [20]. During this period of time, nearly all large-scale financial institutions have set a series of generous incentives for top executives and employees. To give an example of Merrill Lynch, as a famous wealth management corporation in the US, the company set up a bounds pool which was worth up to $3.6 billion, and around 700 executives earned over one million bonuses from the bounds pool. However, the company has actually made a huge loss with around $27 billions in 2008. The phenomena appeared in Merrill Lynch was not a single case. The similar things also occurred in other famous financial institutions such as Goldman Sach and AIF [21,22].

2.4 The Change of Operation Model

In the US, banks finance themselves mainly through deposits. This model is known as "the originate to hold model". Yet, this traditional model has gradually transformed. Banks have started to issue loans, and they either distribute or securitise them as they are made [23]. The new distribution model considerably helps banks to reduce credit and maturity risks associated with the old operation model. For example, an individual obtains a mortgage to buy a house from a bank; and then, this lending bank sells all of its mortgages to an investment bank; this investment bank eventually securitises mortgage portfolios and sells them back to investors in the financial market [24,25].

Securitisation of credit assets enable banks to attract more global investors by offering much cheaper funding, which accelerates the expansion of banks at the beginning of the 2000s. Since then, components of a security have become more complex, normally involving both low risky loans and high risky loans at the same time [12]. Mortgage-related financial products collateralising debit obligation, for instance, have become popular among individuals and institutional investors. This has led to a circumstance in which banks become a seller and buyer of the financial market simultaneously. In 2007, numerous amounts of mortgage bonds were issued, and these bonds were not guaranteed by the government. As a result, the default of mortgages of borrowers caused the collapse of the financial system [12,26].

Securitisation is more popular in the US than in the UK. The relevant data show that the US issued asset-backed securities up to $10,000,000 million in 2018, and 85% of them were residential mortgages [12]. Many financial institutions in the US, like, banks, securities and insurance companies all had involved in mortgage investment. However, there was only $2,000,000 million in the UK, and residential mortgages accounted for 18% [12]. Therefore, when 2008 financial crisis hit, the default of mortgage attacked the majority of the financial institutions in the US, yet it primarily attacked mortgage banks in the UK [12,22].

3. Conclusions

To sum up, the report examines how the flaws of

 DOI: http://doi.org/10.26549/jfr.v5i2.7814

banking systems may result in the 2008 financial crisis in the US. The report analyses the failure of the banking system from four aspects, including the deregulation of the financial market, the development of shadow banking system, the change of operation model of banking system, and improper incentives mechanism. These identified factors are not mutually exclusive. However, they did interact with each other and together cause the 2008 financial crisis in the US. The deregulation of the financial market promoted the development of shadow banking system; additionally, a new distribution model as well as an incentive mechanism further stimulated the expansion of mortgage loans. Those four factors combined together, which influenced and re-built the formal order and form in the financial market, thus leading to the collapse of the financial system at the end.

References

[1] Lo, A. (2009). Regulatory Reform in the Wake of the Financial Crisis of 2007□2008. *Journal of Financial Economic Policy*, 1(1), pp.4-43.

[2] Adrian, T. and Shin, H. S. (2009). The Shadow Banking System: Implications for Financial Regulation. *Banque de France Financial Stability Review*, 13(1), pp.1-10.

[3] Sorkin, R.A. (2011). Too Big to Fail: The Inside Story of How Wall Street and Washington Fought to Save the Financial System and Themselves. *Financial Theory and Practice*, 35(1), pp.129-133.

[4] Vo, H.L. (2015). Lessons from the 2008 Global Financial Crisis: Imprudent Risk Management and Miscalculated. *Journal of Management Sciences*, 2(1), pp.205-222.

[5] Summer, S. and Erdmann, K. (2020). *Housing Policy, Monetary Policy, and the Great Recession*. VA: Mercatus Center at George Mason University.

[6] Acharya, V.V. and Richardson, M. (2009). Causes of the Financial Crisis. *Critical Review*, 21(2-3), pp.195-210.

[7] Shughart, W.F. (1988). A Public Choice Perspective of the Banking Act of 1933. *Cato Journal*, 7(3), pp.595-619.

[8] Broome, L. L. and Markham, J.W. (2000). Banking and insurance: Before and after the Gramm-Leach-Bliley Act. *Journal of Corporation Law*, 25(4), pp.723-785.

[9] White, L.J. (2010). The Gramm-Leach-Bliley Act of 1999: A Bridge Too Far? Or Not Far Enough? *Suffolk University Law Review*, 43(4), pp.1-30.

[10] Barth, J.R., Brumbaugh, J. R.D. and Wilcox, J.A. (2000). Glass-Steagall Repealed: Market Forces Compel A New Bank Legal Structure. *Journal of Economic Perspective*, pp.191-204.

[11] Jickling, M. (2010). *Causes of the Financial Crisis*. (Online). Available at: https://fas.org/sgp/crs/misc/R40173.pdf (Accessed on 11th Feb 2021).

[12] Bentley, K. (2015). *The 2008 Financial Crisis: How Deregulation Led to the Crisis*. (Online). Available at: https://core.ac.uk/download/pdf/48614398.pdf (Accessed on 11th Feb 2021).

[13] Campbell, J.L. (2004). *Institutional Change and Globalisation*. Princeton, NJ: Princeton University Press.

[14] Joshi, B., (2014). *The Shadow Banking System in the United States*. (Online). Available at: https://academicworks.cuny.edu/gc_etds/435 (Accessed on 11th Feb 2021).

[15] Pozsar, Z., Adrian, T., Ashcraft, A. and Boesky, H. (2014). Shadow Banking. *Economic Policy Review*, 19(2), pp.1-16.

[16] Rosen, R. (2011). *The Impact of the Originate-to-Distribute Model on Banks before and during the Financial Crisis*. (Online). Available at: https://core.ac.uk/download/pdf/6453504.pdf (Accessed on 11th Feb 2021).

[17] Ferran, E. (2011). The Break-Up of the Financial Services Authority. *Oxford Journal of Legal Studies*, 31(3), pp.455-480.

[18] Perino, M.A. (2012). *The Financial Crisis Inquiry Commission and the Politics of Governmental Investigations*. (Online). Available at: https://core.ac.uk/download/pdf/217002585.pdf (Accessed on 11th Feb 2021).

[19] Daumal, M. (2012). *The Economic and Political Causes of the 2008 U.S. Financial Crisis*. (Online). Available at: http://pseweb.eu/ydepot/seance/513077_PapierDaumal Crise.pdf (Accessed on 11th Feb 2021).

[20] Financial Times (2008). *The Fatal Banker's Fall*, 1st Oct 2008.

[21] Gupta, T. (2012). Global Financial Crisis: Causes and Consequences. *Journal of Business and Management*,1(3), pp.16-24.

[22] Adam B., Malz, A. and Pozsar, Z. (2012). The Federal Reserve's Term Asset-Backed Securities Loan Facility. *Economic Policy Review*,18(1), pp.29-66.

[23] Mian, A. and Sufi. A. (2009). The Consequences of Mortgage Credit Expansion: Evidence from the 2007 Mortgage Default Crisis. *Quarterly Journal of Economics*, 12(1), pp.1449-1496.

[24] Campbell, J.Y., Stefano, G. and Parag, P. (2011). Forced Sales and House Prices. *American Economic Revie*, 101(5), pp.2108-2131.

DOI: http://doi.org/10.26549/jfr.v5i2.7814

[25] Gupta, A. and Berndt, A. (2009). *Moral Hazard and Adverse Selection in the Originate-to-Distribute Model of Bank Credit*. (Online). Available at: http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=C2ECC44E7C519A91D1A7B40D8E26C00C?doi=10.1.1.697.9820&rep=rep1&type=pdf (Accessed on 11th Feb 2021).

[26] Tanmoy, M., Benjamin, J.K., Amit, S. and Vikrant, V. (2009). *Financial Regulation and Securitisation: Evidence from Subprime Loans*. (Online). Available at: http://dx.doi.org/10.2139/ssrn.1346131 (Accessed on 11th Feb 2021).

 DOI: http://doi.org/10.26549/jfr.v5i2.7814

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

International Experience and Enlightenment of the Regularization Development of Stall Economy

Mengni Chen*

Beijing Institute of Technology, Zhuhai, Guangdong, 519088, China

ARTICLE INFO

Article history
Received: 23 August 2021
Revised: 30 August 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Stall economy
Standard
Economic development
Sustainable development

ABSTRACT

Stall economy can promote the recovery of national economy, relieve the employment pressure of tens of thousands of people, increase people's happiness, and so on. Many benefits brought by stall economy show its important position and function. In fact, stall economy should be a durable product, not a substitute. We should look at it from a long-term perspective, standardize it and develop it. Combined with the practices and policies of many countries on the standardization of street stall economy, this article puts forward the reference methods for the standardization of street stall economy in the future. The country, society and individuals can enjoy the wealth and value brought by stall economy in the future.

1. Introduction

Stall economy can always be welcomed and popular by people in a certain period of time. The fast means of earning money, which is characterized by lower threshold of starting a business, lower business risk and lower commodity price, is popular among low-income people [2]. In the post-epidemic era, stall economy is an effective activity to restore the economy. Many places in China have made good social impact by using stall economy to alleviate economic development difficulties. The development prospect brought by stall economy makes the United States deeply study the self-driving mobile vendors [4]. Legalization of stall economy in Seoul, South Korea [9]. Drawing lessons from international experience, how to develop the stall economy in the future is the topic I want to study.

2. International Experience

2.1 Flexible Management in Chengdu, China

In the post-epidemic era, in March 2020, Chengdu, a city in western China, issued a policy of *five permits and one insistence* (Zhuo L., 2020). On the premise of doing a good job in epidemic prevention and control and sanitation, it allowed temporary occupation of roads and stalls, allowed temporary crossing of street shops, allowed large shopping malls to occupy roads and promote sales, allowed mobile vendors to sell and operate, allowed Internet rental bicycle companies to expand parking areas, and insisted on flexible law enforcement and prudent and inclusive supervision [1]. The opening of this policy allows people who have stayed at home for a long time to seize the opportunity to go out to do business. With the implementation of this policy, Chengdu has solved the employment problem of 100,000 people in one month, which has also been publicly praised

**Corresponding Author:*
Mengni Chen,
Beijing Institute of Technology, Zhuhai, Guangdong, 519088, China;
Email: 1328379192@qq.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8086

by Premier Li Keqiang of China [2]. After the Chengdu policy achieved good results, Guangzhou, Dalian, Chongqing, and other places loosened their policies to spread the economy. The epidemic situation in China is gradually developing towards a better living condition. To release economic vitality and stimulate consumption, all parts of China have further promoted the stall economy to promote standardized development considering the current actual situation.

To promote the development of stall economy, many places have made flexible strategic changes. A few months later, Chengdu implemented an upgraded version of the *Five Permits and One Persistence* policy. Alibaba releases economic assistance plan for street vendors. JD.COM organized a quality supply of over 50 billion yuan to help small stores and expand online operations [11]. Necessary subsidy zone for online stalls in Pinduoduo. The Central Civilization Office also claimed that it had decided not to list the occupation of roads, street markets and mobile traders as the evaluation contents of civilized cities [3]. This move makes the stall economy develop rapidly, and more and more cities join it. People's cooperation and support for the new policy make the stall economy more and more popular. Stall economy not only solves the employment problem of many people and alleviates the poverty of some people, but also adds fireworks to the city and improves people's happiness in life. Of course, under the implementation of stall economy, we should also ensure the good appearance of city appearance and sanitation environment.

2.2 The Sales Future of American Autonomous Driving

With the continuous progress of science and technology, the rapid development of automatic driving technology has joined the street stall economy. Junyu Cao and Wei Qi (October 15,2020) have provided theories and opinions on how to expand the stall economic scale by using automatic wheeled vending booths. They infer that two pairs of dependence and influence relationships (the size of service area and the walking distance between customers and stalls) are crucial to the challenges of sales operation [4]. The mobility of the booth has attracted customers, and the flexible operation has improved the service quality. However, customers wait for time and relocate the booth in the hope that there will be a convincing solution in the future.

2.3 Road Culture in South Korea

In South Korea, street stalls are called road culture. In general, South Korea implements regional management to standardize street stalls. The first category is absolutely prohibited areas, the second category is relatively static areas, and the third category is guiding areas. In 2019, street vendors in Seoul can operate legally under certain conditions [9]. Many stall owners transform small trucks into packaged wagons, selling all kinds of sushi daily necessities, clothing and so on. South Korea has also set up a small greedy owners' association to control the street vendors' economy and solve some street vendors' problems at the same time. The stall owners also spontaneously set up the National Federation of stall owners and set up their own websites to exchange experiences with each other [10]. In South Korea, not only the government is encouraging the stall economy, but also vendors are making efforts to develop the stall economy.

3. Enlightenment

3.1 The Opening Degree of the Stall Economy should be Big or Small

Without affecting the city order, we should use the flexibility of stall economy to manage the formal business premises in different places at different times and encourage vendors to sell their products in a diversified way. The government should relax access to stall economy, but everything should develop within a reasonable standard [7]. Change people's previous views on the mess of spreading the economy, and strictly abide by local regulations on environmental sanitation, avoiding occupying blind roads, and using gas correctly and safely.

3.2 Sustainable Development of Stall Economy

Stall economy should not be an expedient measure to alleviate economic development during the epidemic [8]. In the future, the trend of sustainable development of stall economy will become normalized and regularized. Although social classes exist, it does not mean that there is no poverty in high-rise buildings except refugee areas. Stall economy has solved the problem of subsistence and self-reliance of low-income groups and alleviated the poverty of some people. The stall economy promotes the recovery of the economic market in a short time, but after a long time, how to keep the stall economy hot remains to be studied. Professor Huang expressed that for migrant women, the flexibility of stall economy enables them to balance their job demands while taking care of their families and children [5]. Therefore, the sustainable development of stall economy needs a long-term plan to implement.

3.3 The National Government Needs to Unify the Standard Stall Economy

Establish a unified industry standard, register, and

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8086

supervise stall owners, establish a self-service platform for city stall registration application, and provide free stall management qualification after obtaining approval. For example, the issue of payment and time for the use of stalls. The fees paid should satisfy the stall owners and the government. The time used by the booth should not interfere with traffic and people's travel. For the prescribed standards, the government encourages stall owners to formulate relevant codes of conduct through stall associations [6]. The stall trade association is not only a platform for stall owners to exchange professional business knowledge. As an organization, this association protects the rights and interests of stall owners and provides consumers with complaint channels. It is also the representative of effective communication with the government to stall economic suggestions [12]. This can not only standardize the business threshold, but also help urban management and market departments to manage and make the stall economy intelligent and gridded.

3.4 Street Stall Economy as a Special Urban Culture

As a special street culture, stall economy narrows the distance between people. Stall economy is not only a business gathering, but also provides a new channel for citizens to have leisure and entertainment. The articles placed on the stalls usually reflect the local customs and can make citizens and tourists feel the special local flavor in living areas, downtown areas, and tourist attractions [12]. Compared with online shopping, people have feelings, and street stalls often express people's sense of reality when talking face to face. The close relationship between people is conducive to understanding and tolerance, and makes the whole society become friendly slowly.

3.5 Using Science and Technology to Promote the Diversified Development of Stall Economy

The United States combines autonomous driving with stall economy to form mobile stalls [4]. Many stalls in China support electronic payment, electronically monitor stall management and so on, and use technology to promote the diversified development of stall economy. Electronic payment allows consumers to track and check every disputed transaction and stall owners can better understand the individual needs of consumers. Mastering the specific situation of stall owners through big data is conducive to better solving problems such as taxation, consumer disputes and quality standards. Through scientific management of big data, service and supervision of stall owners can promote the standardization of stall economy. Then further protect the legitimate rights and interests of consumers and create a harmonious business atmosphere [8]. Scientific and effective use of the convenience brought by science and technology, stall economy can be civilian or intelligent, and maximize the economic and social value of stall.

4. Conclusions

Through the different ways of coping with street stall economy in China, the United States and South Korea, the value of street stall economy plays an important role in a country's economic development. It is impossible to standardize the development of stall economy only by banning it. Through reasonable means and scientific guidance, stall operators and city managers can reach a consensus, so that stall economy can develop stably, harmoniously, and healthily, and then promote economic vitality. On the other hand, the booth economy is closely related to people's daily life. With the development of booth economy, the country has increased its GDP, and the society has become more and more warm because of its development. People can get happiness because its development increases income and promotes consumption. To sum up, I think the development of the standardization of street stall economy can be realized one day in the future.

References

[1] Zhuo, L. (May 29, 2020). The Prime Minister has publicly praised the secret of Chengdu's "stall business". Why is it so hot? *Sichuan News*. Retrieved from http://scnews.newssc.org/system/20200529/001073023.html

[2] Xin Jing Bao. (2005). Stall economic revival: Chengdu will increase employment by 100,000. Some people will stall for 3 hours and earn 300yuan. Retrieved from https://baijiahao.baidu.com/s?id=1668378317307845972&wfr=spider&for=pc.

[3] Jiang A. (June 10, 2020). China is Suddenly Going Street Stall Crazy – But is a Crackdown Looming? Retrieved from https://radiichina.com/china-new-stall-economy/.

[4] Cao, Junyu and Qi, Wei, Stall Economy: The Value of Mobility in Retail on Wheels (October 15, 2020). Available at SSRN: https://ssrn.com/abstract=3711896.

[5] Huang, G. Z. (2020). How the 'Street Stall Economy' Helps Those Who Need It Most. Retrieved from https://www.sixthtone.com/news/1005803/How the%E2%80%98StreetStallEcono-

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8086

my%E2%80%99HelpsThoseWhoNeedItMost.

[6] Song, S. C. (2020). Street stall economy in China in the post-COVID-19 era: Dilemmas and regulatory suggestions. *Research in Globalization, Volume 2,* ISSN 2590-051X.

[7] Xuan, T. (2010). To spread the economy of the city. (05), 115-116.

[8] Wu, X. (2020). Rational Recognition of Stall Economy. *BEIFANGJINGMAO*, 1005-913X (2020) 09-0043-03.

[9] SEOUL METROPOLITAN GOVERNMENT. (2018). *Seoul to offer legal status to street stalls*. Retrieved from http://english.seoul.go.kr/seoul-to-offer-legal-status-to-street-stalls/.

[10] MBAlib.com. Stall Economy. Retrieved from https://wiki.mbalib.com/wiki/%E5%9C%B0%E6%91%8A%E7%BB%8F%E6%B5%8E.

[11] JingXiangYuLe. (2020). Stall economy, the vitality of China in the post-epidemic era. Retrieved from https://fanyi.sogou.com/text?keyword=%E5%9C%B0%E6%91%8A%E7%BB%8F%E6%B5%8E%EF%BC%8C%E2%80%9C%E5%90%8E%E7%96%AB%E6%83%85%E6%97%B6%E4%BB%A3%E2%80%9D%E7%9A%84%E4%B8%AD%E5%9B%BD%E7%94%9F%E6%9C%BA%20&transfrom=auto&transto=en&model=general.

[12] Gao, J. (2020). Research on Standardizing the Development of Stall Economy. *Journal of Inner Mongolia University of Finance and Economics (05)*,132-134. DOI: http://dx.doi.org/10.13895/j.cnki.jimufe.2020.05.034.

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8086

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

Comparative Analysis of Chinese Mainland and Hong Kong Insurance Products and the Prospect of Insurance Industry

Yujin Zhang[1*] Jiongjie Liu[2] Caiying Hou[3]

1. School of Central University of Finance and Economics, Beijing, 102206, China
2. School of Huazhong University of Science and Technology, Wuhan, Hubei 430070, China
3. School of Shandong university of finance and economics, Jinan, Shandong, 250000, China

ARTICLE INFO

Article history
Received: 16 September 2021
Revised: 26 September 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Hong Kong
Mainland
Insurance difference

ABSTRACT

As an emerging financial product, insurance is attracting more and more people. Hong Kong with developed insurance industry attracts investment from mainland residents. This paper starts with the development process and current situation of insurance products, insurance markets and relevant government policies in the mainland and Hong Kong, compares the similarities and differences of insurance products in the mainland and Hong Kong, and explores the development prospects and direction of both insurance by finding information and analyzing the audience.

1. Introduction

1.1 Research Background

With the progress of society and the development of economy, the insurance industry is gradually emerging. As financial products with financing, tax avoidance, security and investment functions are emerging, more and more attention is received. Although the insurance industry in the mainland is developing rapidly, it is not as mature as some insurance industries with more perfect international development. The economic prosperity and legal system of Hong Kong and the mainland are different. Many mainland residents choose to invest in insurance in Hong Kong. According to statistics, the five years from 2010 to 2015 soared, setting a new record in 2015, with a total of HK $31.6 billion in the year [1].

1.2 Review of the Literature

Since the earliest British insurance company was founded in Hong Kong in 1841, the Hong Kong property insurance market has started for 100 years. Property insurance in mainland China was restored in 1980. After gradually introducing the market competition mechanism and joining the WTO, mainland property insurance has entered a period of rapid development [3]. Although in recent years, the mainland insurance market share has

**Corresponding Author:*
Yujin Zhang,
School of Central University of Finance and Economics, Beijing, 102206, China;
Email: 410922662@qq.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8391

stood to the second insurance stage in the world, from the level of insurance products, we still need to clearly realize the gap between the developed insurance market [4].

Summing up the above literature, it is found that in the existing research, there is no literature that can pay macro attention to the development trend and prospects of the insurance industry in mainland China and Hong Kong, and take specific companies and their products as comparative reference from multiple perspectives. The analysis of mainland insurance industry is generally based on the initial period and development period of mainland insurance industry, the process and order of the industry is not perfect enough to keep up with the insurance industry reform and international policy adjustment; and based on the current literature of the mainland insurance industry, it is difficult to make a reasonably perfect comparison with Hong Kong insurance.

1.3 Survey Methods

This paper conducts research by collecting second-hand information, field interviews, questionnaires and other research methods as well as combining online and offline research methods.

A total of 221 questionnaires were issued, and after screening 2 questionnaires are invalid, excluding them, the actual number of effective questionnaire is 219, the effective rate is 99.1%. Besides, the number of people who purchased insurance filled out is 152, and the actual effective questionnaire is also 152, so the effective rate is 100%.

In addition, this paper compares the similarities and differences between insurance products in the Mainland and Hong Kong, and explores the development prospects and directions of insurance in these two places by selecting information and analyzing audiences.

2. Insurance Development Process in the Mainland and Hong Kong

2.1 The Hong Kong Insurance Industry Has a Long History

The insurance industry can be regarded as the oldest industry in Hong Kong, with a history of 170 years ago, and has formed a very mature and perfect investment system with decentralized globalization. In the long history of Hong Kong insurance industry, its development generally consists of five stages. In the first stage, from the early Japanese occupation of Hong Kong in the early 1840s to 1941, the development of the insurance industry was mainly insurance agents. Hong Kong developed its economy rapidly with its excellent geographical position. The second stage, in 1945, when Hong Kong was occupied by the British again until the late 1960s, was a period of transition in Hong Kong's insurance industry, with a variety of differences risk species. In the third stage, from the late 1960s to the early 1980s, the insurance industry became international and diversified. In the fourth stage, from the early 1980s to the return of Hong Kong in 1997, we strengthened the standardized governance of various insurance companies, and greatly standardized and institutionalized the insurance industry. The fifth stage, when Hong Kong returned in 1997, is the rapid development of life insurance business and banking insurance business. After the Asian financial storm, a large number of banks entered the Hong Kong insurance market, Hong Kong's life insurance industry achieved strong growth, many international insurance companies also chose to set up a location in Hong Kong, but also for the mainland Technical support [7].

2.2 Current Status of the Insurance Industry

Hong Kong is a famous international financial center. The insurance industry has a long history and naturally has a higher degree of internationalization than that of the mainland market. Hong Kong is also one of the most densely distributed areas of insurance companies. Foreign insurance companies hold a large share of Hong Kong insurance industry, according to the Hong Kong insurance regulator, as of October 21,2013, Hong Kong has a total of 153 authorized insurance companies, including 82 registered in Hong Kong, the rest from various countries and regions, including Bermuda, 12 in Britain, 9, Germany 6,5, three in France, 3 in Canada, Switzerland, 3, Japan There are three domestic companies, two in mainland China, and two in Luxembourg, including Singapore, Italy, Norway, the Netherlands, Engersey, the Bahamas, India, Ireland and the Philippines [8].

3. Comparison between Mainland Insurance and Hong Kong Insurance

3.1 Currency

Mainland insurance is only available by using RMB, while Hong Kong policy allows three currencies: US dollar, HKD and RMB. According to it, policyholders in Hong Kong need to consider currency selection and exchange rate risk when purchasing Hong Kong insurance, as they should not only focus on the short-term benefits of insurance and ignore its long-term nature [9].

3.2 Product Design

In terms of target customers, Chinese mainland

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8391

Insurance Company has a wide target customer base and a low degree of segmentation. The subdivision of Hong Kong insurance companies is more obvious, more targeted and more humanized, and the collection and collation of customer information is more specific and detailed. These background checks can give the insurer a more detailed understanding of the insured and make more accurate risk assessment more accurately.

In terms of fees, Hong Kong insurance companies have higher product premiums, but claims fees are also high. By contrast, the medium level is shown.

Many of Chinese mainland products have lower premiums and claims fees than those in Hong Kong. From the perspective of time, the medical compensation time of Hong Kong insurance is short, long protection cycle, fast claim speed and high efficiency.

Regionally, Hong Kong Insurance has extensive customer protection. Chinese mainland's insurance guarantee group is mainly limited to mainland residents, and the scope of overseas coverage is relatively narrow.

The big difference between insurance products between the two places, the first is the difference in the macro insurance market environment. Different macro environment will inevitably have an important impact on the basic market trends and product design elements.

Comparisons were made using SWOT analysis, with the differences summarized as follows:

Table 1. The SWOT analysis method [6]

	Mainland China	Hong Kong
Strengths	Less restrictions, more customers	High satisfaction and rich products
Weaknesses	Slow reaction and imperfect system	More regulations, fewer customers
Opportunities	Develop the customers, enrich the means	Expand the market
Threats	Foreign insurance	Sustainable development

In addition to the above different macro market environment, the different internal background of micro insurance enterprises is also the reason for the product differences.

3.3 Market Behavior

Market behavior is a strategic behavior taken by enterprises to obtain profits and market share in the market. It is generally divided into price behavior and non-price behavior. The price of property insurance companies generally refers to the rate of property insurance.

At present, mainland insurance companies in price positioning problems are: (1) unreasonable market entities, mainland insurance companies pay more attention to the maximization of premium scale; (2) information asymmetry makes policyholders unable to fully understand the service differentiation of property insurance companies, can only take the price as the preferred reference factor. Property insurers can often gain more market share by disguised reduced rates.

The innovation of insurance products and services in Hong Kong's property insurance market is still at a relatively high level. Although the main insurance types are classified according to statistics, personalized products are very popular. He has the following reference for the development of the mainland insurance market: (1) Hong Kong property insurance is a free competitive market. It is difficult for enterprises to quickly occupy the market through price behavior. Only through the innovation of products and services can enterprises obtain the corresponding market share and profits; (2) appropriate regulatory measures. Hong Kong's insurance supervision system is dominated by other laws and supplemented by self-discipline, forming a comprehensive supervision system that combines government supervision and industry self-discipline [6].

3.4 Legal System

According to the provisions of the Insurance Law, the establishment of insurance companies in the mainland should adopt two organizational forms of joint stock limited company and wholly state-owned company. The insurance industry in Hong Kong developed earlier and has the title of international free port. The organizational form of insurer is different from that of the mainland. Under the Insurance Company Regulations, insure Hong Kong include insurance companies, Lloyd's, exclusive private insurers and non-exclusive insurance rers. In addition, Hong Kong also has financial enterprises with non-specialized insurance business and are engaged in certain insurance business. Therefore, Hong Kong's regulatory laws have diverse forms of insurer organization, allowing mutual insurance organizations besides the corporate system. Individual insurance organizations and concurrently engaged in insurance organizations, this system effectively increases the subject of the insurance business industry, can give full play to the advantages of all kinds of insurers, and effectively promote the benign competition in the insurance market.

Chapter 4 of the Regulations on the Administration of

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8391

Insurance Companies in the mainland specifically makes relevant provisions on insurance terms and rates. Hong Kong has continued to use the previous British insurance supervision model, pursuing free competition and active non-intervention policies. However, for the new insurance business and relatively high risk activities, the Insurance Regulatory Department will timely issue relevant guidelines according to the market trends. Through comparison, the economic activities of various insurance companies in the mainland are mainly supervised through the provisions of the unified insurance market, such as interest rates.Hong Kong, which is open to insurance companies, advocates free competition in insurance rates and conditions [11].

3.5 Cash Value

The different growth rate of cash value is the core difference between mainland insurance and Hong Kong insurance. The cash value of mainland policy is basically fixed, and it has certain advantages in the early stage. In contrast, the cash value of Hong Kong policy is uncertain. Even though dividends are not guaranteed, there are many advantages in the latter stage compared with before.

Table 2. Comparison of Prudential's serious illness insurance with that of the mainland

	Hong Kong	Chinese mainland
The range of conditions covered	There are 118 insurable diseases, covering some diseases not covered in the Mainland. It also provides compensation for the removal of benign tumors, precancerous lesions and other operations that do not constitute serious diseases, including specific cancers in situ, congenital diseases and conditions related to developmental abnormalities to ensure that the scope of diseases keep pace with The Times and be close to the international.	Fewer diseases and serious homogeneity.
Insurance premium	It is 30% cheaper than the mainland, with an additional 50% protection for the first 10 years.	More expensive
Currency	Hong Kong policy allows three currencies: US dollar, HKD and RMB.	Mainland insurance is only available by using RMB.
Assumed interest rate	4%-5%, a combination of health care and long-term savings	3.5%-4%
Number of claims	Additional 320% coverage for cancer, heart attack and stroke is available for multiple claims after claiming critical illness coverage [12]	Only one payment can be made

Take serious illness insurance as an example, the cash value of Hong Kong serious illness insurance is usually zero in the first two years of payment, during which time the withdrawal of insurance can not bring any money back. However, with years of payment, the cash value of the policy will grow rapidly, which means the cash value in the later can be much higher than its premiums, while mainland insurance can not do this.

4. Audience Analysis

The number of valid copies filled out by the purchase insurance population is 152, and these users will be analyzed below.

4.1 Population Characteristic Analysis

(1) Gender distribution is even

The survey data show that the survey includes men accounted for 48.68 percent and women accounted for 51.32 percent, which means that the ratio of men and women is not much different.

Table 3. Basic characteristics of the person who buys the insurance

Variable		Frequency (person)	Percentage (%)
Gender	Male	74	48.68
	Female	78	51.32
Age	50 and above	4	2.63
	40~50	39	25.66
	30~40	48	31.58
	18~30	61	40.13
	18 and less	0	0.00
Educational background	Primary school and below	1	0.66
	Junior middle school	5	3.29
	Senior middle school	33	21.71
	Junior college	39	25.66
	Regular college course	66	43.42
	Master Degree Candidate	7	4.61
	Doctoral candidate	1	0.66
	Post doctor	0	0

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8391

(2) The main age stage is in the middle-aged age

In the statistics, under 18 years of age accounted for 0%, 18 to 30 years old accounted for 40.13%, 30 to 40 years old accounted for 31.58%, 40 to 50 years old accounted for 25.66%, 50 years old accounted for 2.63%.

Buyers mainly concentrated in 18-50 years old as in the middle age stage.

(3) The overall impression of the insurance industry is general

In the overall impression of the insurance industry in the score, 14 people chose 0 to 2 points, accounting for 9.21%, 16 people chose 3 to 4 points, accounting for 10.53%, 5 to 6 points have 28 people, accounting for Compared with 18.42%, 52 people chose 7 to 8 points, accounting for 34.21%, 42 people chose 9 to 10 points, accounting for 27.63%. The total value is of 1029 and the average is of 6.77, so the overall impression of the insurance industry in general.

4.2 Type and Expectation of Insurance being Bought

(1) The type of insurance being bought

According to the survey data, health insurance is the most popular type of insurance, with 44.74 percent of those who have purchased insurance. Besides, 36.84 percent have purchased old-age insurance, 36.18 percent have chosen accident insurance, 35.53 percent have chosen life insurance, 32.24 percent have chosen property loss insurance, 27.63 percent have chosen liability insurance, and 25.66 percent have chosen credit insurance.

(2) Buying insurance pays more attention to whether the product is reliable

Statistics show that the top three priorities for insurers deciding whether to buy a class of insurance are: reliability (62.50%), ease of insurance coverage (42.76%), and good solution (42.11%), which shows that insurance buyers attach far more importance to the reliability of insurance products than to their product diversity.

(3) Purchase insurance channels diverse

Statistics show that 45.39% of insurance buyers have purchased insurance through bank distribution channels, followed by 43.42% through agent channels, and the least number of people (23.03%) choose Internet channels. It can be seen that insurance users because of reliability more inclined to buy insurance offline, and Chinese society decided that more users chose acquaintances and agent channels.

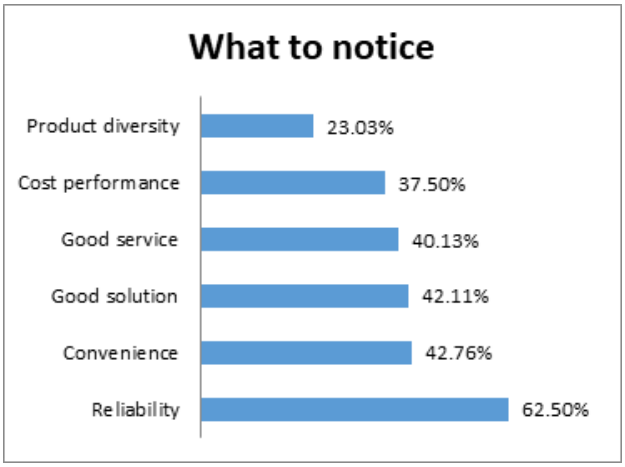

Figure 1. Buy insurance focus on what

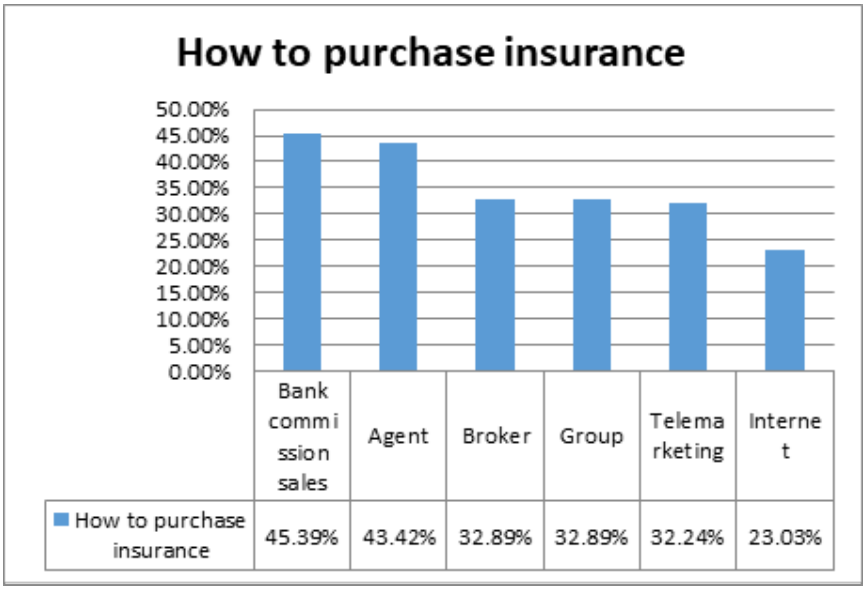

Figure 2. Purchase insurance channels

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8391

4.3 Expectations for Insurance Products and Industries

(1) Insurance industry and product improvement points

By compiling survey data, customers' main expectations for insurance are making fewer nuisance calls, improving protection services, and wanting the insurance industry to better explain the various regulations of insurance to customers.

(2) Think of the future direction of insurance industry

Survey data show that insurance users believe that the future directions of insurance industry development are production and marketing separation, medium-sized enterprises to enter the market and continue to compete, insurance companies to improve investment capacity, product differentiation and big data applications.

5. Development Prospects or Direction of Insurance in Both Places

With the deepening of contact and communication between Hong Kong and the mainland, Hong Kong generally has roughly two important development opportunities. First, with the gradual deepening of RMB internationalization, Hong Kong can firmly grasp the role of Chinese and foreign insurance and constantly explore opportunities for mainland personal asset allocation and overseas funds to invest in the mainland market. Second, with the gradual implementation of various national policies and plans in the Guangdong, Hong Kong and Macao Greater Bay Area, Hong Kong insurance can be vigorously developed in the Free Trade Area and the Greater Bay Area [5].

China's insurance market is facing a bloody huge change that has changed from a relatively extensive economic development model to a scientific, reasonable and standardized economic development model. First, from the perspective of insurance products, speed up the replacement of products, and constantly expand the scope of security and insurance. Second, standardize the sales activities and agent behavior of insurance companies, reduce the risk surrender rate and other expense rates, broaden the investment channels within the scope of supervision, and strive to improve the profitability of insurance funds. Third, strengthen the supervision of insurance companies, improve the quality of insurance, and cooperate with public media and other relevant departments to gradually popularize insurance knowledge to the public to create better conditions for the convenience of claim settlement. Fourth, we should use scientific and technological means to carry out digital strategic transformation, find new opportunities in scene embedding, accurate marketing, user mining, user experience optimization and other aspects, and lead our new journey from a big insurance country to a strong insurance power [4].

References

[1] China insurance network.Mainland landers buy 1 / 4 insurance in Hong Kong, [EB/OL].http://xw.sinoins.com,2014-04-08.

[2] Zeng Yubin, Chen Dongsheng.Mainland residents must buy insurance in Hong Kong against five risks [N].Securities Times, 2016-04-25.

[3] She used to be a prefauna.A Comparative Analysis of the Property Insurance Market in Mainland China and Hong Kong [J].Modern Management Science, 2015 (12): 73-75.

[4] Feng Qiongying.Difference Analysis between Mainland Insurance and Hong Kong Insurance [J].China Management Information Technology, 2020,23 (05): 131-133.

[5] Li Mengjie.Comparison analysis of Hong Kong Insurance and Mainland Insurance [J].China Management Information Technology, 2019,22 (16): 141-142.

[6] Dong Di.Comparative analysis of Medicare products in Mainland China and Hong Kong [J].Western Finance, 2012 (09): 47-50 + 60.

[7] Chen Yujing.The reference significance of the development of Hong Kong's insurance industry to the mainland.Financial Forum, 2016 (06): 79-80.

[8] Wei Wei.On the difference and development situation of Hong Kong and the mainland, financial circles, 2011.6:141-142.

[9] Shao Jiaoer.Differences and misunderstanding of insurance between the two places [J].China Foreign Exchange, 2017 (20): 65-66.

[10] Feng Qiongying.Difference Analysis between Mainland Insurance and Hong Kong Insurance [J].China Management Information Technology, 2020,23 (05): 131-133.

[11] Ren Jian, Comparison between the legal system of mainland and Hong Kong, Journal of Hebei University of Economics and Trade, 2005,26 (04): 88-92.

[12] Sun Ningyao, a brief analysis of the difference between Hong Kong insurance and mainland insurance, Bohai Rim Economic Outlook, 2019.4:168-169.

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8391

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

On the "Past and Present" of Hong Kong's Finance

Boya Zhou* **Zifei Wang**

University of Clermont Auvergne, Clermont, Ferrand, France

ARTICLE INFO

Article history
Received: 20 September 2021
Revised: 30 September 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Hong Kong changes
Hong Kong finance
Hong Kong development prospects

ABSTRACT

Finance is vital to a country, and Hong Kong, as a special part of the large economy of China, has unique advantages and development history. And Hong Kong's growth from a small fishing village to a financial centre has its inevitable factors: historical, geographical and policy advantages. After nearly a century of rapid development, Hong Kong has achieved many proud accomplishments in the following fields: economy, medicine, education, etc. In the process, the cooperation between Hong Kong and the mainland has become increasingly close, and the two sides of the Strait have become excellent "partners". In recent years, due to the COVID-19 epidemic and the rise of China as a big economy, Hong Kong is facing an unavoidable dilemma. In view of this, the authors suggest that Hong Kong can develop financial technology, enhance financial security, implement green finance, and promote corporate innovation. At the same time, Hong Kong should also strengthen the relationship with the mainland. Generally speaking, under the current circumstances, Hong Kong will continue to exist as an important financial center of China, but Hong Kong should also actively face the challenges of the times and explore new developments directions in the future.

1. Introduction

Finance is the lifeblood of a nation's economy, and Hong Kong, as the financial and trading centre of China and the world, has always played a unique role in China's economic development. Its changes and future development are of vital importance to the country. In recent years, along with the rapid development of first-tier and super first-tier cities such as Shanghai and Guangdong, Hong Kong seems to be in a development dilemma, but there is no doubt that its position as a financial center is unshakable. The purpose of this paper is to explore the history of Hong Kong's financial economy and to offer the authors' opinions on its future development.

2. From a "Small Fishing Village" to a World Financial Centre

The development of Hong Kong, which began as a small fishing village in the borderlands of southern China, to its current status as a world financial center, is not only a finished product brought about by time, but also has its inevitable factors of development. This chapter will elaborate the reasons for its development from three aspects: history, geography and politics, and sketch the achievements of Hong Kong since its development at the end of this chapter.

2.1 Corollaries to Development

2.1.1 Historical factors

(1) A brief history of Hong Kong after its opening

In 1840, the Opium War broke out, and from then until 1898, the Qing government ceded Hong Kong Island, the Kowloon Peninsula and the New Territories to Britain on three separate occasions. At the beginning of the cession,

**Corresponding Author:*
Boya Zhou,
University of Clermont Auvergne, Clermont, Ferrand, France;
Emial: zhouboya2001@gmail.com

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

Hong Kong was generally regarded as a frontier area by the British military and political circles, and was described as "small, barren, unhealthy and valueless". From then on, Hong Kong was "forced" to become an open port. In 1941, the Governor of Hong Kong surrendered to Japan, and Hong Kong entered a period of "three years and eight months" of Japanese occupation until 1945, when Japan declared its surrender. In the 1950s, due to the previous civil war between the Kuomingtang and the Communist Party, a large number of people poured into Hong Kong. At this time, Hong Kong was gradually developing from a port into an industrial city. In 1978, China implemented the policy of reform and opening-up. Hong Kong, as the "window of exchange" between China and the world, brought capital, talents, advanced business ideas and other resources to the development of the mainland. Meanwhile, the investment and construction of factories in the mainland by Hong Kong businessmen has brought benefits to both sides. In 1997, Britain handed over sovereignty over Hong Kong to China, ending 156 years of rule in Hong Kong, and at the same time, the Hong Kong Special Administrative Region was established. In February 2019, the Central Committee of the Communist Party of China and the State Council of the People's Republic of China issued the <Outline of the Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area>, stating "Strongly support Hong Kong in consolidating and enhancing its status as an international financial, shipping and trade centre and an international aviation hub, promoting the development of finance, commerce, logistics and professional services in the direction of high-end and high value-added development, and building a more competitive international metropolis." [1]

(2) A critical juncture for Hong Kong's take-off

From the above historical process after the opening of Hong Kong, it is easy to see that Hong Kong's take-off relied not on its own natural resources, industrial structure and other conditions, but on the globalization of the economy, China's trade with overseas countries, and China's support and provision of convenient conditions for Hong Kong's trade development after the reunification.

Historically, the 156 years of British colonial life were an opportunity for Hong Kong to become a "free port" for China. At the beginning, the British made Hong Kong a free port with zero tariff to seek more benefits from the Qing government, which laid the foundation for the development of Hong Kong's finance in the later years; in the early years of the founding of the country, China was in urgent need of all kinds of capital, talents and technology during the economic blockade of China by foreign countries. At the time, Hong Kong served as the "Strait of malacca"between China and the West; after the reform and opening up, China opened up its economy, but not its finance, most notably in terms of currency, China imposed foreign exchange controls to protect financial security. However, for foreign investors who want to enter the Chinese market, it undoubtedly increases the risk of investment and reduces efficiency. At this time, Hong

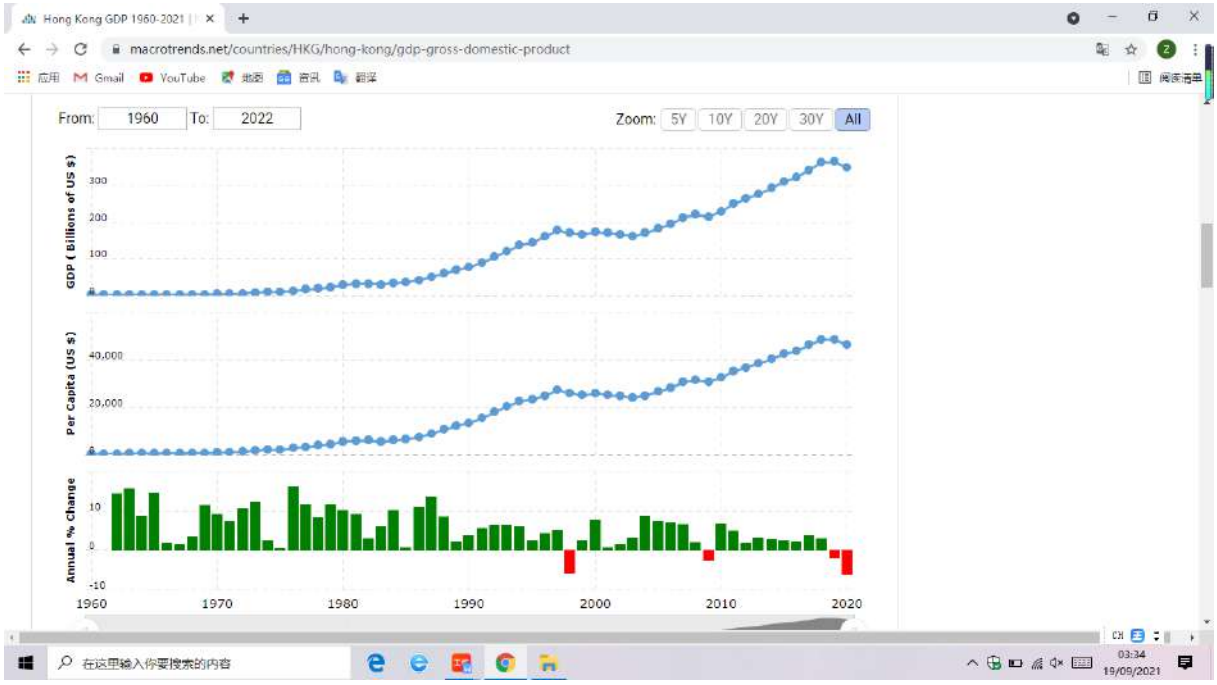

Figure 1. Statistics of Hong Kong's GDP situation (to 2020) [2]

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

Kong, as the place where "one country, two systems" was implemented, adopted a free monetary policy. Thus, the existence of Hong Kong became a balance between the mainland and foreign investors, i.e. to ensure a good entry of foreign capital, but also to ensure the financial security of China. From this point onwards, Hong Kong's financial sector took off rapidly and gradually became one of the "Four Little Dragons of Asia", showing the world its strength.

2.1.2 Geographical advantages

Hong Kong is located on the coast of southern China, across the river from Shenzhen in the north, and is roughly divided into Hong Kong Island, the Kowloon Peninsula, the New Territories and other islands. Between the Kowloon Peninsula and Hong Kong Island, there is a natural deep-water harbor, Victoria Harbour, which can accommodate many large ocean-going vessels at the same time. In addition, the climate there is warm and the harbour remains unfrozen all year round, allowing ships to enter and leave freely in winter. This makes Hong Kong an excellent port for all kinds of goods and trade.

Apart from its advantages in maritime transport, Hong Kong is also an international aviation hub, connecting more than 220 countries and regions worldwide, with over 1,100 daily flights between Hong Kong and the rest of the world. It is possible to travel from Hong Kong to major Asian cities in a relatively short time, with a flight coverage of 50%. Under the authority of the State, Hong Kong has signed civil aviation agreements with 67 civil aviation partners, including more than 50 countries along the "Belt and Road", and Hong Kong's aviation network covers the whole world [3]. Dong Yu, Executive Vice President of the China Development Planning Institute of Tsinghua University, said, "Enhancing Hong Kong's status as a national aviation hub actually enhances Hong Kong's position in the overall national transport infrastructure layout, and it will enable Hong Kong to better integrate with the surrounding aviation layout".

2.1.3 Superior policy regime

Judging from the history of Hong Kong's financial take-off, the policies given by the Government and its system have played a great role. When it comes to the "freedom" policy, we have to mention the "one country, two systems" policy implemented by the Chinese Government for Hong Kong, that is, under the premise of one China, the main body of the country adheres to the socialist system, while Hong Kong, Macau and Taiwan maintain their original capitalist systems [5].

This has allowed Hong Kong to have a more liberal monetary policy and a Hong Kong law system informed by common law, creating excellent conditions for financial development in Hong Kong. A liberal monetary policy allows for a greater range of legal capital transactions and a faster and freer exchange of information. The Hong Kong legal system belongs to the common law system, which has relative advantages over the civil law system in financial litigation, arbitration, mediation and dispute resolution. There is a more direct correlation with the international financial system dominated by the United Kingdom and the United States, and it has more international credibility in terms of justice, arbitration and mediation [6].

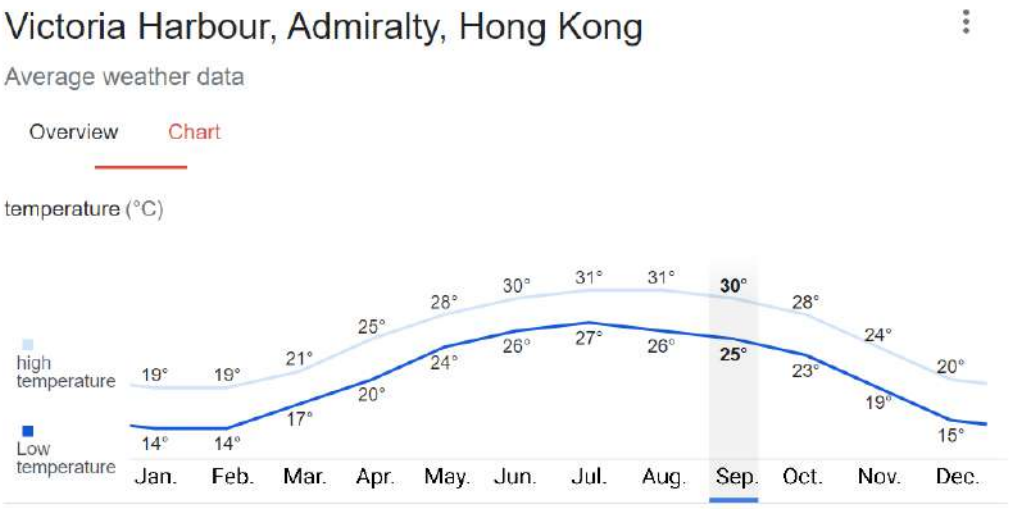

Figure 2. Average of weather data for Victoria Harbour, Hong Kong [4]

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

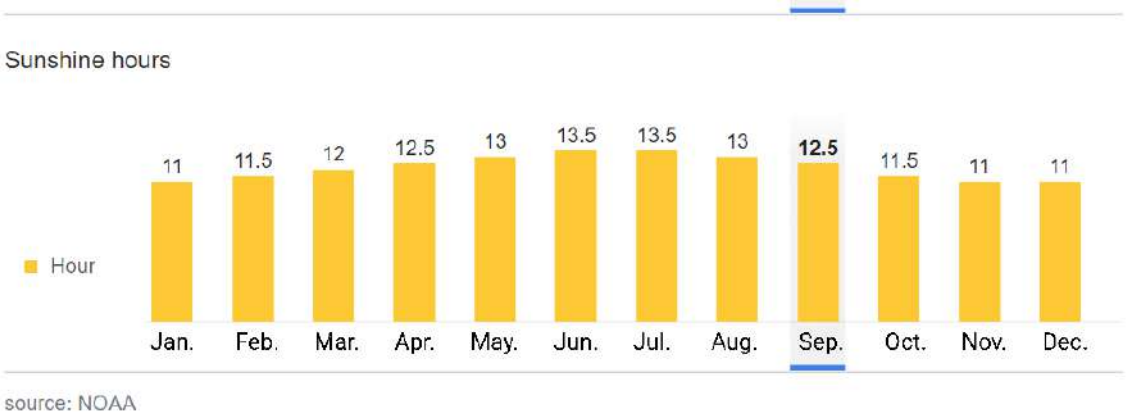

Figure 3. Sunshine duration data for Victoria Harbour, Hong Kong[4]

2.2 Hong Kong's Post-development Achievements

Since Hong Kong's financial take-off, it has made great achievements not only in the financial sector, but also in the medical and education sectors.

Finance: known as the "NY·Lon·Kong" alongside New York and London, it is the world's third largest financial centre and is also known as one of the world's freest economies and most competitive cities. From the late 1960s to the 1990s, Hong Kong, along with South Korea, TaiWan China and Singapore, was named "Four Asian Tigers" during its rapid development; and was ranked 7th in the <2018 Global Competitiveness Report> published by the World Economic Forum; in 2019 Hong Kong was ranked 4th in the world in the Human Development Index.As of 2019, Hong Kong has topped the Economic Freedom Index rankings published by the Heritage Foundation for 24 consecutive years.

Medical care: Thanks to the world's leading medical standard and related supporting facilities, Hong Kong has the world's highest life expectancy; the world's highest cure rate for stomach cancer; the world's highest cure rate for lung cancer; the world's highest cure rate for liver cancer, tied with the United States; and the world's highest survival rate for breast cancer patients and heart transplantation.

Education: Hong Kong universities have long been performing brightly in the more authoritative world university rankings such as QS World University Rankings and Times Higher Education Rankings. For example, in 2020, the QS World University Rankings ranked the University of Hong Kong 25th, the Hong Kong University of Science and Technology 32nd and the Chinese University of Hong Kong 46th, with the rankings of each university rising rather than falling compared to the previous year.

3. The State of Finance Hong Kong

As seen in the previous section, Hong Kong has achieved a lot in many areas. In recent years, the financial state of Hong Kong has changed, while there are many crises and challenges. This chapter will address both the changes in Hong Kong's finance and the challenges that Hong Kong faces.

3.1 The Transformation of Hong Kong and the Mainland

3.1.1 Hong Kong to mainland changes

Increase in the number of Mandarin speakers: while Cantonese remains the most commonly spoken language in Hong Kong, followed by English, the number of Mandarin speakers has increased by 1.16 times over the decade, with the highest percentage of habitual Mandarin speakers in Hong Kong in Central and Western (4.2%), Wan Chai (3.8%) and Yau Tsim Mong (3.7%) respectively, according to the 2016 HKSAR Government Census. The vast majority of Hong Kong's total IPO financing come from Mainland Chinese companies, Hong Kong banks and brokerages recruit financiers from the Mainland and use their Mandarin to facilitate initial public offerings (IPOs) and other financial transactions.

(1) Employment situation: According to Hong Kong Ta Kung Pao, more and more Hong Kong university students are looking at and thinking about the opportunities of moving to the Mainland. Moreover, with the rapid economic development of China and the improvement of people's living standards, salaries in the Mainland have also increased substantially and the salary gap with Hong Kong is gradually narrowing.

(2) Awareness of the Mainland: "East View" is a daily information programme launched in Hong Kong in 2011, it will cover news about the Mainland and will

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

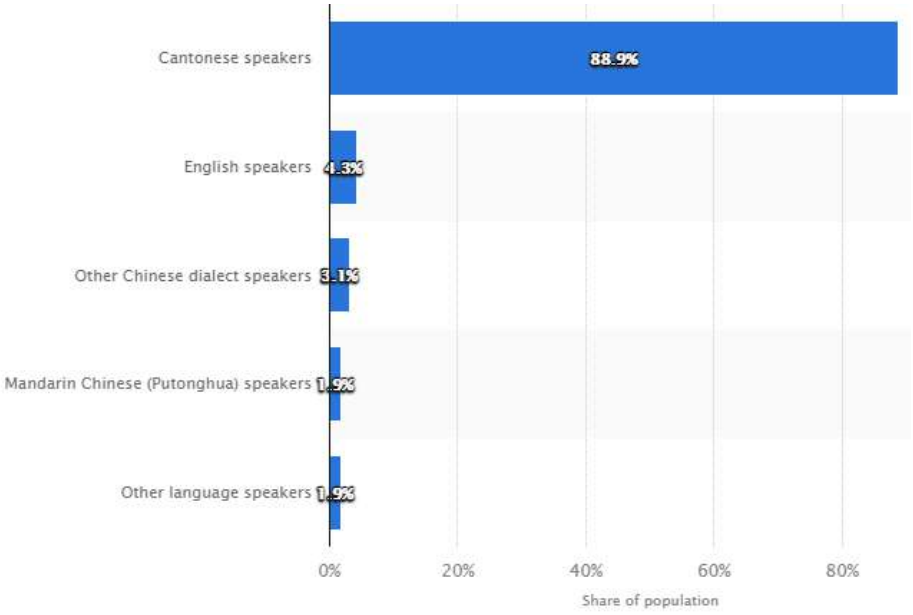

Figure 4. Breakdown of population in Hong Kong 2016, by language [7]

give comments. More Hong Kong people can learn about important events and policies happening in the Mainland in real time through the programme.

3.1.2 Mainland to Hong Kong changes

The ripple effect of the trade war between the United States and China on the Hong Kong economy is minimal. Many companies listed in the United States withdrew and chose to list again in Hong Kong, returning to the embrace of the motherland, which, for the companies themselves, can enjoy the relevant domestic policies; for China's economic development, it has played a catalytic role, and Hong Kong has closer economic ties with the interior. In addition, mainland enterprises will list in Hong Kong first, and then in other countries, because some countries have tax exemptions for Hong Kong.

The establishment of the Hong Kong-Zhuhai-Macao Bridge has played an important role in the development of the Guangdong-Hong Kong-Macao Greater Bay Area, facilitating communication and enhancing cooperation. It is conducive to enhancing the economic status of the Pearl River Delta region and driving the development of the surrounding cities, and there are no longer geographical limitations in the movement of people and materials between Hong Kong and the Mainland. The bridge is not only a milestone in the history of Chinese architecture, but also a strong link between Hong Kong, Macao and the Mainland.

3.2 Hong Kong Finance under the Challenges

Since the beginning of the 21st century, the "dark horses" of Chinese mainland cities have emerged frequently, of which Shanghai and Guangzhou can be considered typical representatives. Shanghai has always been the financial and economic center of China, and its GDP growth rate has become faster since 2007. In the first half of 2021, Shanghai achieved a regional GDP of 20,102.53 billion yuan, an increase of 12.7% in comparable prices compared with the same period last year, with an average growth of 4.8% in two years [8]. Meanwhile, Guangdong's GDP in the first half of 2021 was 5,722.631 billion yuan, up 13.0 percent from a year earlier, with a two-year average growth of 5.0 percent [9]. While more and more mainland cities are appearing on the international stage and exerting more influence, Hong Kong is facing not only a small loss of focus in the public eye, but also a sluggish economy brought about by the epidemic outbreak since early 2020. In the first quarter of 2020, Hong Kong's regional GDP fell by 8.9% year-on-year, private consumption fell by 10.1% and investment dropped by 14.3%; in the second quarter GDP declined by more than 6% as well [10]. At this point, some bad voices began to emerge in the community, saying that Hong Kong was in a "crisis on the edge" and was gradually withdrawing from the stage of the world's financial center. The followings are some of our views on where Hong Kong's financial development should go.

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

4. Proposals for the Future Development of Finance in Hong Kong

4.1 "Supporting Hong Kong's Development as an International Centre for Innovation and Technology" (14th Five-Year Plan) [11] - Development of Financial Technology (Fintech)

Nowadays, all industries are permeated with technology, and the financial industry should also integrate technology to improve the productivity of financial products and use big data to better analyze in order to make optimal choices. Technology is particularly important during the COVID-19 epidemic, for example, Bank of China Hong Kong, Alibaba, Tencent, and Ping An of China have virtual banking licenses issued by the Hong Kong Monetary Authority [12], and these companies can use virtual banking to enter into financial business transactions to hedge some financial losses. Hong Kong's financial industry itself is already very developed, and if it wants to move on and consolidate its position as an international financial center, it needs the support of technology to break the limites of time and space, to keep in touch with the inland more conveniently and effectively, and to expand the scope of financial business in the inland and even globally.

4.2 "Strengthening Hong Kong's Risk Management Centre Function" (14th Five-Year Plan) [11] - Safeguarding Financial Security

With a strong foundation and technology in place, there needs to be a shield to keep the building of finance safe as it is built increasingly higher. It can be strengthened in the following two ways:

(1) The security of the circulation of money. In simple terms, finance is the circulation of money. Whether tangible or intangible (such as stocks and bonds), money is the most basic and important transaction tool of the financial industry. As Hong Kong holds two-thirds of the foreign exchange reserves of the Mainland, ensuring the security of foreign currency circulation is very important to the development of international trade. In addition, Hong Kong is a financial hub, and the provision of RMB to the outside world in a secure environment is conducive to promoting the process of RMB internationalization.

(2) The security of financial market transactions. For example, there are risks in investment and financing, there are risks in listing companies, and there may be a crisis of confidence between buyers and sellers. For important financial links like these, laws and regulations need to be upheld, illegal transactions need to be severely punished, grey area transactions need to be combated, and relevant laws and regulations also need to be improved. Only when the safety of the financial transaction market is ensured will participants be able to engage in the financial industry with ease mind and courage, thus enabling the financial industry in Hong Kong to usher in new development opportunities.

4.3 Implementing a Green Finance Strategy

The long-term plan for enterprise development is to implement the sustainable development strategy, in which green finance is an important part. On 24 February 2021, the 2021-2022 Hong Kong Budget stated that "the [Green and Sustainable Finance Funding Scheme] will be launched to fund debt issuance and external evaluation services" [13] and that enterprises should follow the policy development and enjoy the policy benefits.

In addition, before implementing financial projects, the impact on the environment should be estimated, so as to minimize the damage to the environment with less impact on the revenue, and the environmental management strategy should be considered while preparing financial projects. Nowadays, most countries around the world are committed to carbon neutrality, and China is also aiming to achieve carbon peak by 2030 and carbon neutrality by 2060, so it is reasonable for companies to follow the development of the country and take carbon emissions into account in their projects.

4.4 Innovation: A Meeting of Minds between Companies

Innovation is a constant theme of development, and everything in the world is changing all the time, from the country's economic output, GDP, and infrastructure development of cities to the happiness index of the people and the transformation of their minds. Therefore, whether it is finance or any other industry, its purpose is ultimately to serve the people, so it is also necessary to innovate according to the changing situation to meet the various and developing needs of the people.

As we all know, competitive relationship is the norm among enterprises, especially enterprises producing similar products usually compete for the market and consumers. Although benign competition can make enterprises progress to a certain extent, in my humble opinion, only cooperation can achieve a win-win situation. As Liu Yuezhong has said "We should deeply analyze the economic forms, new directions, new trends and new policies at home and abroad, and build a platform for mutual exchange and cooperation among enterprises".

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

An enterprise's product and project production should have a considerable promotion scale, ranging from half a year to one year. After completion, the market should be tracked. The process should preferably last until the end of the product life cycle. If it is a high-quality product, the enterprise will operate for a long time to earn the cost consumed before. In terms of manpower, material resources and time, after polishing, the enterprise model will gradually move closer to the production of high-quality products, but in the long run, it will inevitably solidify the products. Therefore, in addition to injecting new blood, enterprises can also learn from each other with their peers, or even work together to develop cooperative projects, Similar to exchange students in universities, enterprises can often hold some exchange summits to share the production process of successful products or the experience of failed products, so that peers can be corrected without loss.

4.5 Strengthening Ties between the Mainland and Hong Kong

Since the beginning of Hong Kong's financial development, the manufacturing industry in the Mainland has provided it with a large amount of resources. Since 1978, when China implemented its reform and opening up, a large number of enterprises have raised funds in Hong Kong, providing a considerable amount of capital for the financial development of Hong Kong. At the same time, after nearly 50 years of development, Hong Kong's financial market has accumulated a lot of experience, its financial system as well as its regulatory system has been gradually improved, and its risk resilience has been enhanced [14]. As a financial bridge between the mainland and the international arena, it is of great significance to the development of China's financial system. Ties between the mainland and Hong Kong have always been close, under the current international situation, Hong Kong should "lean on the mainland", actively establish financial exchanges with the mainland, make reasonable use of the "preferential policies" given by the mainland, and bring more benefits to China's finance. We should act as a "bridge" and a "communication portal", so as to achieve a "win-win" situation.

4.6 Enhancing the Mobility of Talents between the Mainland and Hong Kong

In the financial industry, great people are indispensable. Fresh graduates should be the preferred recruitment object, because they are easier to cultivate loyalty to the company and long-term work, and have great development potential. Moreover, the current job market for inland university students is tight, with few employment opportunities for young people and a high employment threshold. This is an opportunity that cannot be missed for Hong Kong to strengthen its ties with the Mainland. Therefore, local universities in Hong Kong can expand the recruitment of mainland students and broaden the scope of talent selection,so that more people can have the opportunity to study in Hong Kong, experience the developed financial system in Hong Kong, provide a platform for internship, encourage young people to take up employment and start up businesses, and continuously add vitality and inject new blood into the financial industry.

5. Conclusions

Hong Kong has experienced the desolation, the darkness of colonial rule, the financial storm and SARS, but Hong Kong has not been crushed, Instead,it has continued to rise by taking advantage of its historical, geographical and policy advantages, and it has successfully transformed itself from a small fishing village into a metropolis. Today, Hong Kong is full of tall buildings, one of the three major international financial centers in the world, and has left NY·Lon·Kong in the Oxford dictionary; it has also made great achievements in health care, education and so on. More than 20 years after Hong Kong's return to the motherland, the mainland has continued to give policy support, and Hong Kong has seized the opportunity to become a financial hub, an international aviation hub, and an indispensable player in the process of opening up China's international markets and internationalizing the RMB. What is more valuable is that while developing its economy, Hong Kong has not lost its awareness of ecologiecal protection, but has pursued sustainable development. Of course, Hong Kong will face obstacles and challenges in its development. This requires Hong Kong to be more closely connected with the mainland, follow the steps of policies, move in the general direction, and continue to contribute to China's development; In addition, while relying on the mainland, we should take great strides to go global, assess the situation, follow the trend of the times, and continue to innovate and develop; Hong Kong can make use of the existing resources of the mainland and the international market, give consideration to both inside and outside, and develop in both directions, so as to make the financial industry the icing on the icing, and other industries to scale new heights, so that Hong Kong will become a more influential international metropolis. In a word, Hong Kong will remain the backbone of China's future economic development.

DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

Author Contributions

The two authors have the same degree of contribution and are the co-first author.

References

[1] The Central Committee of the Communist Party of China State Council issued the Outline of the Development Plan of Guangdong, Hong Kong and Macao Greater Bay Area. http://www.gov.cn/zhengce/2019-02/18/content_5366593.htm#1www.gov.cn. [2019-03-11].

[2] Data sources include: World Bank (https://www.macrotrends.net/countries/HKG/hong-kong/gdp-gross-domestic-productRetrieved 2021-09-18.).

[3] Interview on "Enhancing Hong Kong's status as an international aviation hub and promoting high value-added logistics development" by Chan Fan, Secretary for Housing and Transport of the HKSAR Government, on 2 September 2021, China Radio and Television Corporation's Greater Bay Area Voice.

[4] Data source: NOAA (https://www. ncdc.noaa.gov/).

[5] White Paper on "The Practice of "One Country, Two Systems" in the Hong Kong Special Administrative Region" (full text) □ Information Office of the State Council of the People's Republic of China[citation needed2017-02-17].

[6] "Maintaining the Prosperity and Stability of Hong Kong's Financial Markets in the New Development Landscape" Contributing Researcher, Xi Jinping Research Centre for Socialist Thought with Chinese Characteristics for a New Era, Chinese Academy of Social Sciences Hu Bin, Secretary of the Party Committee and Deputy Director, Institute of Finance, Chinese Academy of Social Sciences.

[7] Breakdown of population in Hong Kong 2016, by language published by C.Textor, Aug 3,2021 (https://www.statista.com/statistics/329051/hong-kong-population-breakdown-by-language/).

[8] "Shanghai's GDP up 12.7% year-on-year in first half" Liberation Daily https://news.sina.com.cn/c/2021-07-22/doc-ikqciyzk6897251.shtml.

[9] "5.27 trillion yuan! Guangdong's GDP up 13 percent in first half of year" Source: Southern Daily Online http://www.gd.gov.cn/gdywdt/bmdt/content/post_3351065.html.

[10] "Outlook for the Development of Hong Kong's Financial Markets under the Double Crisis" Ma DaiXuan Guo BaiLi.
DOI: http://dx.doi.org/10.13768/j.cnki.cn11-3793/f.2021.0045.

[11] From Chapter 61 of the Outline of the Fourteenth Five-Year Plan and Vision 2035 for the National Economic and Social Development of the People's Republic of China (the "14th Five-Year Plan"), Section I on Supporting Hong Kong and Macao in Consolidating and Enhancing Their Competitive Advantages.

[12] On 30 May 2018, the HKMA issued a revised guideline on "Recognition of Virtual Banks", which clearly states that "banks, financial institutions and technology companies may apply to hold and operate virtual banks in Hong Kong".

[13] The Financial Secretary of the HKSAR Government, Mr Paul Chan, presents the HKSAR Government's Budget for the financial year 2021-2022 in the Legislative Council.

[14] Tang YJ. Confidence in Hong Kong's financial sector is stable [N]. Global Times, 2020-07-04 (007).

 DOI: http://dx.doi.org/10.26549/jfr.v5i2.8528

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

The Impact of Digital Economy on Total Factor Productivity of China's Service Industry

Chunyan Liang* **Zhengyuan Chen**

Academy of Humanities and Social Sciences, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, 212000, China

ARTICLE INFO

Article history
Received: 24 September 2021
Revised: 30 September 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Digital economy
Total factor productivity of service industry
Super-efficiency SBM-Malmquist

ABSTRACT

As a kind of integrated economy, digital economy has an important impact on the economic growth and production and lifestyle of multiple countries and regions, and plays a significant role in promoting the reconstruction of the international economic pattern. As an important industry of China's national economy, the service industry is crucial to China's economic growth. This paper measures the development level of digital economy in provinces and cities through constructing digital economy index system, uses super efficiency SBM-Malmquist model to measure total factor productivity of service industry, and tests the influence effect of digital economy on total factor productivity of Chinese service industry. Finally, the optimization path of digital economy on China's service industry is proposed.

1. Introduction

In recent years, the digital economy has developed vigorously. At December 2018, at the G20 Summit held in Argentina, General Secretary Xi Jinping put forward the strategic goal of "promoting the deep integration of the digital economy and the real economy, while paying attention to the application of new technologies and risks and challenges, and strengthening the construction of the institutional system". As a kind of integrated economy, the digital economy has an important impact on the economic growth and production and living mode of many countries and regions, and has played a significant role in promoting the reconstruction of the international economic pattern, which has attracted widespread attention from all countries. As far as the domestic situation is concerned, China is in a strategic transition period of high-quality economic development. As the largest industry in China's national economy, the service industry is of great significance to high-quality economic development. The digital economy itself has the characteristics of innovation and high efficiency, which meets the requirements of high-quality development. Therefore, the development of digital economy provides a new way to improve the total factor productivity of the service industry and even the whole social operation mode, and contribute new economic growth points. Promoting the integration of digital economy and service industry is of great significance to the reconstruction of international trade

**Corresponding Author:*
Chunyan Liang,
Academy of Humanities and Social Sciences, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, 212000, China;
Email: 2240398312@qq.com

DOI: http://doi.org/10.26549/jfr.v5i2.8595

rules, the adjustment of industrial structure under the domestic "new normal" and the continuous stability of economic order.

2. Literature Review

2.1 Relevant Literature on the Digital Economy

The concept of the digital economy first appeared in Don Tapscott (1996) [1]. On the Digital Economy: Hope and Risks in the Age of Intellectual Connectivity. In the early stage, scholars at home and abroad mixed "digital economy" with "Internet economy" and constructed a relevant system framework [2]; Some scholars also give corresponding level measures based on provincial research [3]. In general, the academic research on the level measurement of digital economy has undergone a theoretical transformation from "Internet economy" to "digital economy". At present, the academic research on digital economy is mainly focused on the economic benefits of digital economy, digital industrialization and industrial digitalization [4]. The convergence mechanism of inclusive finance on urban and rural income proves that digital inclusive finance can narrow the urban and rural income gap [5]. From the two levels of boosting the development of information industry and the deep integration of traditional industries and big data, we combed the development mode of industrial digitalization and digital industrialization in China, and analyzed the factors affecting the choice mode of enterprises, and put forward coping strategies from the two aspects of enterprise information application and information industry technology innovation [6]. From driving industry efficiency, promote industrial cross-border integration, reconstruction of industrial development competition mode, enabling industry upgrading four aspects, explains the value dimension of the industry digital, with "digital economy to promote industrial upgrading" as the starting point, from infrastructure construction, incentive mechanism and collaborative governance, system reform three aspects put forward the optimization path [7]. From the aspects of top-level design, overall planning, overall layout and digital governance, the successful experience of the digital economy development of the Yangtze River Delta is systematically summarized. It provides a model for digital economy development in other regions [8]. With "double cycle" as the strategic background, analyzes the challenges and opportunities facing Chinese industry digital transformation, and puts forward the "promotion mechanism", "collaborative mechanism", "sharing mechanism", "guarantee mechanism" four policies and digital infrastructure, governance level, mode innovation, technology system four dimensions, put forward the coping strategy and promote the digital transformation in China.

2.2 Relevant Documents on the Total Factor Productivity of the Service Industry

The research on total factor productivity in the service industry mainly focuses on three aspects: horizontal measurement, factors affecting total factor productivity and the impact of total factor in service industry productivity on other related industries. There are three main methods to measure total factor productivity in the service industry: non-parametric Malmquist index method [9-12]. Using gray correlation method to analyze the total factor productivity of qinhuangdao, shows that the total factor productivity of the service industry is not obvious, is still the market environment, output scale and industrial agglomeration, the local economic development level and residents prosperity play an auxiliary role [13]. Based on the inter-provincial panel data, with foreign investment and tax revenue as the two basic entry points, it is found that the overall efficiency improvement of the service industry can drive the efficiency growth of the manufacturing industry [14]. From the perspective of tourism innovation, we review the spatial effect of knowledge-intensive service industries in China's three urban clusters, compare the agglomeration effect and spatial spillover effect of relevant industries, and put forward corresponding strategies on the effect of radiation [15]. Based on the inter-provincial panel data, from the two dimensions of industrial digital and digital industrialization, the research has found that the development of digital economy has a spatial spillover effect, and has a certain role in promoting the total factor productivity.

To sum up, although the research on digital economy has achieved fruitful results, the effect of digital economy on service total factor productivity is relatively rare. Therefore, the advanced and unique of this article is: first, this article novel topic, digital economy is an important strategic guiding ideology and development direction in the difference plan and 2035 vision, and the service industry will gradually become the pillar of China's economic development, study the impact of digital economy on the total factor productivity of service industry is an innovative exploration. Second, in the research method, a variety of research methods cross application, mutual confirmation, through the application of entropy method of China digital economy development level, using super efficiency SBM-Malmquist model of provinces and cities, using measurement model for regression test, to explore the influence of digital economy on total factor productivity of Chinese service industry.

 DOI: http://doi.org/10.26549/jfr.v5i2.8595

3. Research and Design

3.1 Evaluation method of the digital economy

Model settings

In information theory, entropy is a mathematical method used to judge the degree of variation of some indicator. The greater the degree of variation, the greater the indicator in the level of the digital economy development, the greater the weight of the indicator; otherwise, the smaller the degree of variation, the less the weight of the index. The basic steps for implementing the entropy method are as follows:

Calculation formula for the 1) extremal method (for positive indicators):

$$X'_{ijk} = \frac{X_{ijk} - m_j}{M_j - m_j} \tag{1}$$

Among them, i means provinces and cities, j for indicators, k for year, M_j.For the X_{ijk}.Maximum value of, m_j.For the minimum value, then the X_{ijk}.j indicator of i Province in k.

2) dimensionthe raw data to determine the index weights:

$$P_{ijk} = \frac{X'_{ijk}}{\sum_{i=1}^{n} X_{ijk}} \tag{2}$$

3) entropy and the entropy of j index:

$$e_j = -\frac{1}{\ln n}\sum_{i=1}^{n} P_{ijk}\ln\left(P_{ijk}\right) \tag{3}$$

4) variance coefficient calculation:

$$g_j = 1 - e_j \tag{4}$$

The 5) determines the weight of the evaluation indicators:

$$w_j = \frac{g_j}{\sum_{i=1}^{n} g_j} \tag{5}$$

6) calculation of comprehensive score:

$$S = \sum_{i=1}^{n} w_j X'_{ijk} \tag{6}$$

The weight score of each digital economic inde x is calculated by entropy method and used by $x_{i1k.}$, $x_{\cdot i2k.}$… $x_{\cdot ink.}$ Each index is represented separately.

Selection of the 2. index system

According to the 2018 Global Digital Economy Development Index, there are 5 first-level indicators and 14 second-level indicators and the development of China's digital economy. Therefore, this paper follows the principle of scientific nature and accuracy of index data sources, selects the statistical data of 30 provinces and cities in China from 2007-2019, and constructs the following evaluation index system for digital economy development, as shown in Table 1.

Table 1. Evaluation System of Digital Economy Development Index

Primary indicators	Secondary indicators	Third-level indicators	Type
Level of digital economy development	Communication capability and service level (P1)	Internet Broadband Access port (X1)	Forward direction
		Long-distance optical cable line length (X2)	Forward direction
		Long Distance Telephone Switch Capacity (X3)	Forward direction
		Mobile phone switch capacity (X4)	Forward direction
	Creative abilities (P2)	Total R&D Personnel (X5)	Forward direction
		R&D Internal expenditure (X6)	Forward direction
		R&D topics (X7)	Forward direction
	Third Industries (P3)	Value value of tertiary industry (X8)	Forward direction
		Number of legal person units of the tertiary industry (X9)	Forward direction
		Third Industry Fixed Assets Investment (X10)	Forward direction

3.2 Measurement Method of Total Factor Productivity in the Service Industry

3.2.1 Model settings

(1) The SBM model build

Data envelope analysis (DEA) is a model method based on linear planning and distance function, including several models including CCR, BCC, SBM, etc. However, traditional CCR and BCC models cannot measure all relaxation variables and are defects in efficiency evaluation, hence the SBM model proposed by Tonek Kaoru:

$$min\rho = \frac{1 - \frac{1}{m}\sum_{i=1}^{m}\frac{s_i^-}{x_{ik}}}{1 + \frac{1}{q}\sum_{r=1}^{q}\frac{s_r^+}{y_{rk}}} \tag{7}$$

$$s.t.\begin{cases} x_k = X\lambda + S^- \\ Y_K = Y\lambda - S^+ \\ \lambda、\ s^+、\ s^- \geq 0 \end{cases} \tag{8}$$

DOI: http://doi.org/10.26549/jfr.v5i2.8595

$t = 1/(1+\frac{1}{q}\sum_{r=1}^{q} s_r^+/y_{rk})$Order, its linear planning form is:

$$min\rho = t - \frac{1}{m}\sum_{i=1}^{m}\frac{ts_i^-}{x_{ik}} \#(9)$$

$$s.t. = \begin{cases} tx_k = X t\lambda + ts^- \\ ty_k = Y t\lambda - ts^+ \\ t = \dfrac{1}{1+\frac{1}{q}\sum_{r=1}^{q}\frac{s_r^+}{y_{rk}}} \\ \lambda、\ s^+、\ s^- \geq 0 \end{cases} \#(10)$$

$\rho^*\lambda s^- s^+$Among them, it indicates the efficiency value of the DMU being evaluated, m, q is the number of input and output variables and the vector variable; X, Y is the input and output variable matrix; x, y represents the input and output of DMU and the relaxati on var i able of input and output; i, r means i input and r output respectively. When the efficiency value =1 in the model, it is shown that the evaluated DMU is strongly effective ρ^*.

(2) The Malmquist index

The Malmquist index was originally proposed by Malmquist in 1953, and in 1994 Rolf Fare et al combined nonparametric linear planning with data envelope analysis (DEA) theory by which the index is possible to decompose the productivity changes into technical and technical efficiency changes, so the Malmquist index is defined as:

$$M(x^t, y^t, x^{t+1}, y^{t+1}) = (M^t \times M^{t+1})^{\frac{1}{2}} = \left[\frac{D_c^t(x^{t+1}, y^{t+1})}{D_c^t(x^t, y^t)} \times \frac{D_c^{t+1}(x^{t+1}, y^{t+1})}{D_c^{t+1}(x^t, y^t)}\right]^{\frac{1}{2}} \quad (11)$$

$$EC = \frac{D^{t+1}(x^{t+1}, y^{t+1})}{D^t(x^t, y^t)} \quad (12)$$

$$TC = \left(\frac{D^t(x^t, y^t)}{D^{t+1}(x^t, y^t)} \times \frac{D^t(x^{t+1}, y^{t+1})}{D^{t+1}(x^{t+1}, y^{t+1})}\right)^{\frac{1}{2}} \quad (12)$$

Among t hem, indicating the input and output of the t period, respectively, indicating the distance function of the period. When the technical efficiency change (EC) value is greater than 1, the relative technical efficiency is improved; when the technology progress change (TC) value, the technological innovation is greater than 1.

3.2.2 Index system construction

(1) Selection of the study subjects

Service industry is the general term of industry in the electronic information era, which is divided into service industries and service undertakings. Using the data of the fourth national economic census provided by the National Bureau of Statistics in 2018, we can obtain 141-digit service industries, 452-digit, 1743-digit, and 3254-digit service industries. Considering the availability and scientific nature of data, the input and output factor data of provinces and cities from 2007-2019.

(2) Selection of capital investment indicators

For capital investment, refer to [16]. The capital stock estimation theory is formulated as follows:

$$K_{ik} = K_{ik}(1-\delta_{ik}) + I_{ik} \quad (14)$$

$K_{ik}I_{ik}\delta_{ik}$ Among them, i ndicating the service capital stoc k of i area in the k period, indicates the constant price investment of i area in each period, indicating the depreciation rate, the depreciation rate is 4%. For the estimation of the base period capital stock, refer to [17]. The formula is as follows:

$$K_{i,k-1} = \frac{I_{ik}}{g_{ik} + \delta_{ik}} \quad (15)$$

g_{ik} Among them, the geometric average growth rate of output over a period of time, that is, the geometric average value of the added value of the service industry in various provinces and cities from 2007 to 2019.

(3) Selection of labor input indicators

Labor input should be considered in various factors, such as the quality of labor, labor quantity and other factors. Considering the availability of data, the number of year employed as the labor input index.

(4) Selection of service industry output indicators

This paper selects the added value of the service industry in various provinces and cities as the output variable, taking 2007 as the base year. Considering the data loss of some provinces and cities, the arithmetic average method complements the missing data.

3.3 Construction of the Measurement Model

3.3.1 Benchmark model setting

This article establishes the following benchmark model:

$$\ln TFP_{ij} = \lambda_0 + \lambda_1 \ln INT_{ij} + \lambda_2 control_{ij} + \delta_{ij} \quad (16)$$

TFP_{ij} Among them, i represents the province, j represents the year, the total factor productivity of the service industry, the indicators of digital economy development, the control variables, and the random error items.$INT_{ij}control_{ij}\delta_{ij}$

3.3.2 Index system construction

(1) Variinterpreted variable

Service total factor productivity (TFP) is selected as

the interpreted variable.

(2) Explain the variable

The core interpretation variable of this paper is the Data Economy Development Level (INT), and the Internet broadband access port in the province and city where the sample is the proxy variable.

(3) Control variable

Control variables include the level of scientific and technological development, fiscal expenditure, urbanization level, and foreign investment. Among them, the development level of science and technology adopts the technology market turnover, recorded as TMT; financial expenditure by the general budget expenditure of the provinces and cities, the GBE; urbanization level as the proportion of urban population at the end of the year, and PUP; foreign investment by the number of foreign invested enterprises in various provinces and cities, recorded as NFIE.

4. Positive Results and Analysis

4.1 Calculation Results of the Level of Digital Economy Development

From the development level of regional digital economy from 2007-2019, see Table 2 and Appendix 1 for specific values.

Table 2. Development level of digital economy in all regions of China

	Average level	Annual growth rate
Beijing	0.685	-1.11%
Tianjin City	0.096	-0.46%
Hebei Province	0.219	0.11%
Shanxi Province	0.125	-0.65%
Inner Mongolia	0.126	-0.81%
Liaoning Province	0.213	-4.46%
Jilin Province	0.112	-0.88%
Heilongjiang Province	0.156	0.00%
Shanghai	0.320	-0.04%
Jiangsu Province	0.436	-0.30%
Zhejiang Province	0.329	1.51%
Anhui Province	0.178	-0.17%
Fujian Province	0.176	-0.66%
Jiangxi Province	0.120	1.67%
Shandong Province	0.354	0.00%
Henan Province	0.265	1.36%
Hubei Province	0.223	-0.86%
Hunan Province	0.205	2.84%
Guangdong Province	0.501	-1.61%
Guangxi Province	0.156	1.61%
Hainan Province	0.024	4.23%
Chongqing	0.106	3.83%
Sichuan Province	0.354	1.65%
Guizhou Province	0.098	2.19%
Yunnan Province	0.154	2.88%
Shaanxi Province	0.232	-1.04%
Gansu Province	0.092	-0.14%
Qinghai Province	0.038	4.44%
Ningxia Province	0.019	5.17%
Xinjiang Province	0.102	1.61%

Data in Table 2 show that the development level of China's digital economy shows an overall upward trend, but the phenomenon of unbalanced and uncoordinated development among regions still cannot be ignored. Among them, the top three levels of digital economy development are Beijing 0.69, Guangdong, 0.50 and Jiangsu 0,0.44; the last three are Ningxia 0.02, Hainan 0.02, and Qinghai 0.04. It can be seen that due to differences in policies, economic level and human resources, the digital economy development level of the three urban clusters is high and strong radiation force, while the development index of the eastern coastal areas is significantly faster than that of the central and western regions; and the development index of Hainan and the five northwest provinces are lower than the average level and the development level is low.

However, in terms of annual growth rate, the top three annual growth rate of digital economy is Ningxia 5.17%, Qinghai 4.44% and 4.23% in Hainan; the latter three are Liaoning-4.46%, Guangdong-1.61% and Beijing-1.11% respectively. With the advancement of the strategy of "western development", the growth rate of digital economy in central and western China is greater than that of relatively developed eastern regions. Since 2013, the northwest region has led Ningxia to promote the building of the western cloud base, actively combining digital technology with government affairs, transportation, parks and other industries, and making its digital economy grow rapidly through the construction of a new smart city. Among them, Qinghai Province thoroughly implemented the "Broadband China" strategy, earnestly implemented the "Broadband Qinghai · Digital Qinghai" strategic plan (2014-2020) ", with the" three network integration "as the starting point, promoted the construction of" Qinghai on the cloud ", making its growth rate firmly in the top three. Based on the strategy of the "One Belt And One Road" digital economy channel, Southwest China strengthens the connectivity of infrastructure and promotes the construction of the digital economy, making its growth

DOI: http://doi.org/10.26549/jfr.v5i2.8595

rate in the top 10. For developed areas along the eastern coast, the economy has entered a new normal, so the growth rate has slowed down and gradually turned into a stage of high-quality development.

4.2 Calculation Results of Total Factor Productivity in the Service Industry

By calculating the total factor productivity of the service industry in 2007-2019, the following results are shown in Table 3.

Table 3. Total factor Production Index of Regional Service Industry in 2007-2019

Province	TFPC.	EC.	TC.	PEC.	SEC.
Beijing	1.073	0.995	1.078	0.997	0.998
Tianjin City	1.084	1.006	1.077	1.007	0.999
Hebei Province	1.040	0.974	1.068	0.981	0.993
Shanxi Province	1.007	0.955	1.054	0.961	0.994
Inner Mongolia	1.068	0.997	1.072	0.992	1.005
Liaoning Province	1.073	0.996	1.077	0.996	1.000
Jilin Province	1.064	0.992	1.073	0.991	1.000
Heilongjiang Province	1.054	0.992	1.062	0.995	0.998
Shanghai	1.070	1.000	1.070	1.000	1.000
Jiangsu Province	1.095	1.019	1.074	1.024	0.996
Zhejiang Province	1.075	0.998	1.077	1.002	0.997
Anhui Province	1.043	0.986	1.058	0.986	1.000
Fujian Province	1.048	0.979	1.070	0.981	0.999
Jiangxi Province	1.049	0.992	1.058	0.994	0.999
Shandong Province	1.059	0.994	1.065	1.009	0.985
Henan Province	1.043	0.983	1.062	0.987	0.995
Hubei Province	1.042	0.983	1.060	0.985	0.998
Hunan Province	1.049	0.990	1.059	0.990	1.000
Guangdong Province	1.057	0.991	1.067	1.000	0.991
Guangxi Province	1.036	0.976	1.061	0.976	1.000
Hainan Province	1.027	0.966	1.063	0.969	0.997
Chongqing	1.093	1.016	1.075	1.014	1.002
Sichuan Province	1.037	0.979	1.058	0.980	0.999
Guizhou Province	1.108	0.957	1.063	0.958	0.999
Yunnan Province	1.033	0.972	1.063	0.971	1.002
Shaanxi Province	1.087	1.023	1.063	1.025	0.998
Gansu Province	1.024	0.966	1.060	0.971	0.994
Qinghai Province	1.015	0.959	1.058	1.000	0.959
Ningxia Province	1.028	0.968	1.062	0.999	0.970
Xinjiang Province	1.014	0.955	1.062	0.957	0.998
Nationwide	1.053	0.985	1.066	0.990	0.996
Eastern Region	1.064	0.993	1.072	0.997	0.996
Central Region	1.047	0.986	1.062	0.987	0.999
Western Region	1.048	0.977	1.063	0.985	0.992

According to the data in Table 3, that the total factor production index of each province and urban region is greater than 1, and the total factor growth rate of service industry in eastern region is 6.37%, central region is 4.66% and 4.75%, which shows that the total factor growth rate of service industry is significantly different in different regions. With its excellent geographical location and reasonable industrial structure, the total factor growth rate of the service industry has been maintained at a high level. Among them, since 2007, the introduction of foreign investment has entered the golden period of rapid development, gradually forming a new situation of "secondary industry and service industry", making the total factor growth rate of service industry to 9.5%. With the total factor productivity of western development. Among them, Guizhou established the first national big data center in 2015, realizing the synchronous data transmission and remote backup of the national and disaster preparedness center in Guizhou, so the total factor growth rate of Guizhou ranked first; the central industrial structure adjustment entered the deep water zone, the service industry development lags behind, and the industrial structure needs to be optimized, resulting in the growth rate behind other regions. Among them, the total factor growth rate of the service industry in Shanxi Province is only 0.7%, due to the proportion of Shanxi Province that is a resource-based industry in higher provinces, investment in the service industry lags behind and the total investment is low, making their growth rate ranked last.

Figures 1, 2 and 3 show that the technology progress index in each region is greater than 1, but the technology efficiency change index, pure technology efficiency change index and scale efficiency index do not exceed 1, which shows that the improvement of total factor efficiency in the eastern region and western regions mainly depends on the improvement of technological progress, and ignores the technical efficiency. If they want to break the bottleneck period and maintain the continuous growth of total factor productivity in the service industry, we must pay attention to improving technology efficiency and scale efficiency. The technical efficiency change index in the central region and the efficiency change index of pure technology efficiency are also less than 1, among which the scale and efficiency change index of 5 provinces is greater than or equal to 1, indicating that a large number of production factors are outflow and the degree of opening up to the outside world is low, making the economic structure unreasonable and the industrial adjustment seriously lags behind. The shortage of funds leads to the lack of market vitality, the weak independent growth of enterprises, and the total factor growth rate

 DOI: http://doi.org/10.26549/jfr.v5i2.8595

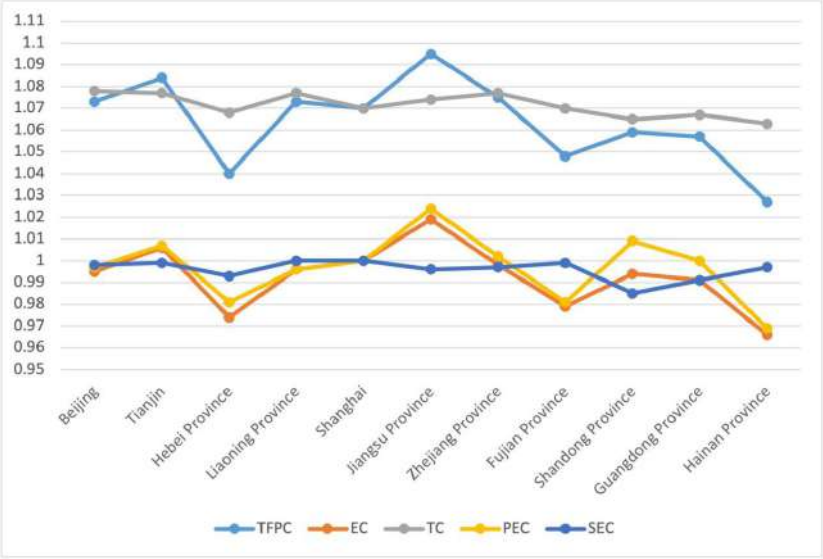

Figure 1. Eastern region TFP and its decomposition index

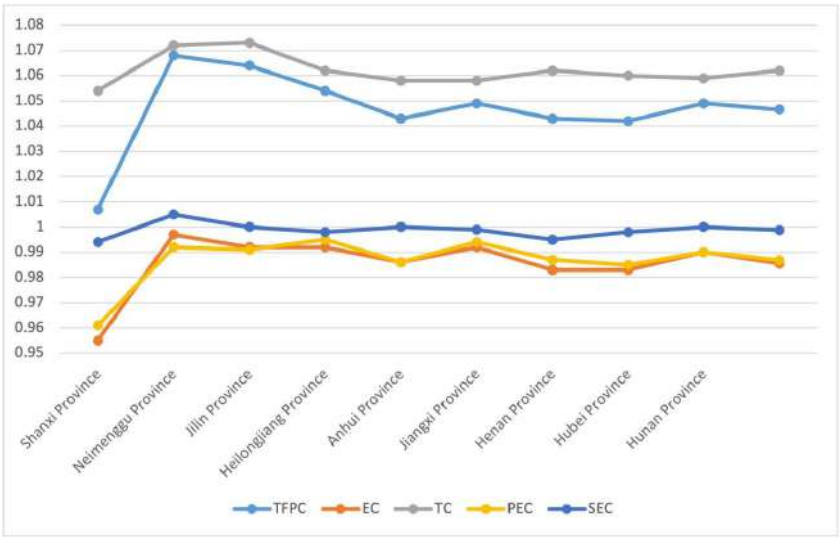

Figure 2. Central region TFP and its decomposition indicators

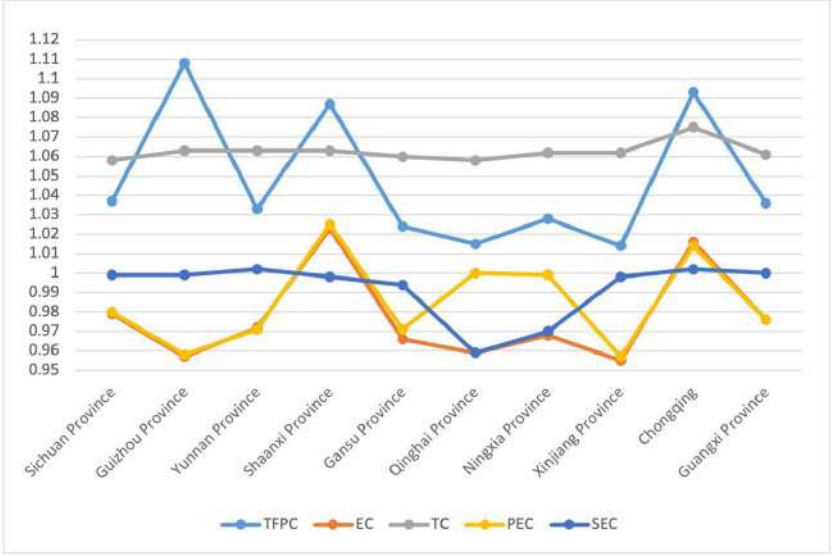

Figure 3. TFP and its decomposition index in the western region

DOI: http://doi.org/10.26549/jfr.v5i2.8595

of the service industry lags behind the east and western regions. Therefore, as the "hollow zone" of high-end producer services, the Central Plains Economic Zone needs to accelerate the spatial agglomeration effect of the service industry, and balance the proportion of high, middle and low-end services, so as to achieve catch-up.

4.3 Inspection of the Impact of the Digital Economy on the Total Factor Productivity of China's Service Industry

First, this paper uses the overall sample data for the impact of the digital economy on the total factor productivity of the service industry

In empirical analysis, through Hausman test, the fixed effect model is selected for regression. Model 1-model 4 is to consider the regression of time fixed effect and provincial fixed effect based on the addition of control variables. See Table 4 for specific results.

Table 4. Base regression results

	（1）	（2）	（3）	（4）
Variables	InTFP.	InTFP.	InTFP.	InTFP.
InINT.	0.609*** (4.87)	0.597*** (4.68)	0.588*** （4.57）	0.576** (4.50)
InTMT.	0.466*** (3.84)	0.457*** (3.79)	0.509*** （4.15）	0.443*** (3.68)
InGBE.	0.444*** (3.70)	0.442*** (3.66)	0.441*** （3.64）	0.440*** (3.62)
InPUP.	-0.278 （0.448）	-0.1408** （0.560）	-0.1374** （0.561）	-0.1416** （0.564）
InNFIE.	0.211*** (1.86)	0.170*** (1.21)	0.184*** （1.57）	0.0814* (0.34)
Constant item	1.903*** （77.53）	2.108*** （66.07）	2.153*** （58.74）	2.134*** （61.45）
Time effect	Not controlled	Not controlled	Control	Control
Provincial effect	Not controlled	Control	Not controlled	Control
N.	390	390	390	390
$R.^2$	0.465	0.474	0.445	0.487

Note: *, * *, * * * tables represent significant at 10%, 5%, 1%, and values in parent heses represent the corresponding t value.

It can be seen from Table 4 that the digital economy promotes the total factor productivity in the service industry. The fixed effect is found that there are time and provincial differences in the influence of digital economy on total factor productivity in the service industry. In addition, other control variables also have some impact on the total factor productivity in the service industry. As can be found from model 4, the coefficient of the technology market turnover (TMT) is positive and significant, indicating that the greater the transaction volume of the technology market, the higher the total factor productivity of the service industry. The greater the turnover increase of the technology market indicates that the higher the transformation efficiency of scientific and technological achievements, so it is easy to improve the total factor productivity of the service industry; the coefficient of the general budget expenditure (GBE) of all provinces and cities is positive and significant, indicating that the more the government general budget expenditure, the higher the total factor productivity of the service industry. The increase in general budget expenditure shows that the increase in government input and basic research factors can improve the infrastructure level of enterprises and promote the vitality of enterprises, thus having a positive impact on the improvement of total factor productivity in the service industry.

The coefficient of urbanization level (PUP) is negative and significant, indicating that the rapid urbanization process is not conducive to the improvement of total factor productivity of the service industry. In recent years, the steady influx of rural labor into cities has led to a sharp expansion of the urban population, causing not only serious unemployment problems, but also increased urban poverty. Therefore, the urbanization process is significantly faster than that of the industrial structure transformation process is not conducive to the improvement of total factor productivity in the service industry; the factor of foreign investment (NFIE) is positive and significant, indicating that the increase of foreign investment is conducive to the improvement of total factor productivity in the service industry. The increase of foreign investment is conducive to enterprises attracting investment and technology and wisdom, and promoting the improvement of total factor productivity of the service industry on the basis of optimizing the business environment and adhering to open development.

4.4 Test of Robustness

The above tests show that the development of digital economy can significantly promote the improvement of total factor productivity. For stability seriously, this paper selects the tool variable method to handle the endogenous problem. Taking the Internet broadband access port of various provinces and cities as the premise, tool variables construct the development level of digital economy, and use the second stage least squares method to return. See Table 5 for specific results.

 DOI: http://doi.org/10.26549/jfr.v5i2.8595

Table 5. Robustness Inspection

	(5)	(6)	(7)
InINT.	0.138*** (2.18)	0.142*** (2.63)	0.144*** (2.85)
InTMT.	0.1085** (0.052)	0.3711*** (0.127)	0.0237 (0.045)
InGBE.	0.427 (0.357)	0.230 (0.610)	0.187 (0.639)
InPUP.	-0.1440** (0.0573)	-0.0883 (0.144)	-0.0813* (0.0453)
InNFIE.	0.113 (1.53)	0.168 (1.72)	0.177 (1.86)
Constant item	0.548*** (0.775)	0.301*** (0.222)	0.312*** (0.324)
Time effect	Control	Control	Control
Provincial effect	Control	Control	Control
N.	390	390	390
$R.^2$	0.0182	0.3206	0.1164

Note: The values in parentheses indicate standard deviations, and the *, * *, * * * scores are significant at 10%, 5%, 1% levels.

According to the results of model 5 - model 7, the overall digital economic indicators are exogenous and are significantly effective in the total factor productivity of the service industry.

5. Conclusions and Policy Suggestions

5.1 Conclusions

Through the construction of digital economy index system, we measure the development level of provinces and cities in 2007-2019. At the same time, the influence of digital economy development on the service industry total factor productivity is analyzed because of the empirical economic linkage between regions, and obtains the following conclusions:

First, the overall development level of digital economy is on the rise, but the regional development is unbalanced. The development index of the eastern coastal regions is significantly higher than that of the central and western regions, and the digital economy growth rate of the central and western regions is greater than that of the relatively developed eastern regions.

Second, the development of digital economy has a positive impact on the total factor productivity of the service industry and helps to improve the total factor productivity in the regional service industry.

Third, the level of scientific and technological development, fiscal expenditure and foreign investment will promote the improvement of total factor productivity of the service industry. However, the level of urbanization has a negative impact on total factor productivity of the service industry. The rapid urbanization process is not conducive to the improvement of total factor productivity of the service industry.

5.2 Policy Suggestions

Through the construction of digital economy index system, we measure the development level of provinces and cities in 2007-2019. At the same time, the influence of digital economy development on the service industry total factor productivity is analyzed because of the empirical economic linkage between regions, and obtains the following conclusions:

Improves the policy system and jointly promotes the development of the digital economy

(1) Increase the industrialization of basic research and development in basic software, high-end chips and core components. We will fully strengthen cooperation with universities and research institutes, and promote the in-depth integration of production, education and research. Use government procurement and financial incentives to solve the problem of core technology "bottleneck": strengthen basic research in cutting-edge industries such as artificial intelligence, big data, cloud computing and quantum computing. We will encourage market participation and balance industrial, innovation and competition policies.

(2) Establish a timely artificial intelligence safety ethics prevention system, attach great importance to the risks brought by the application of artificial intelligence technology, and strive to promote the application of artificial intelligence technology in the field of security. On the other hand, the risk of artificial intelligence products may delay technical research and industrial development in related fields, and AI enterprises in related industries may withdraw from research and development under the pressure of public opinion. According to the ethical risks of AI, the relevant regulatory institutions should formulate the corresponding identification mechanism and tracking mechanism to eliminate the hidden dangers in time [18].

(3) Promote the application of 5G in the industrial field, and clarify the 5G application of requirements and application scenarios. In view of the groups that have significantly reduced employment opportunities and knowledge and skills cannot adapt to the digital service industry due to intelligence, the relevant departments should make plans as early as possible, make predictions and plans, resolve the pressure through skills training, increase the effective supply of public welfare posts, and comprehensively plan the social security system to play the role of social security [19].

DOI: http://doi.org/10.26549/jfr.v5i2.8595

Takes measures according to local conditions to promote coordinated competition in the service industry

(1) With the urban circle and urban agglomeration as the basic carrier, promote the regional integration strategic arrangement of market integration, convenient connectivity, industrial integration, innovation cooperation, governance coordination, and achievement sharing. Free trade zone linkage mechanism as the starting point, in the first three batches in 2018 on the basis of free trade zone collaborative open development initiative, according to the role of 18 free trade zone, and regional urban area and urban agglomeration market unified construction, break the administrative barriers, break the barriers of all factors of production mechanism, to "area" construction "introduction" and "go out", with more inclusive and open attitude, build a free trade zone open network system. Establish related collaborative open new platform and BBS mechanism, improve the level of connectivity, build collaborative mechanism, guide the national development zone, high-tech development zone to participate in the free trade zone reform, establish industry-university combination mechanism, digital as a means, close contact with universities and research institutes, speed up the transformation of high and tech scientific and technological achievements, improve the upstream and downstream industrial chain.

(2) Actively promote the relevant free trade zone, high-tech industrial development zone, city integration demonstration zone, economic and technological development zone, digital transformation, using technical discount, loan discount, industrial guidance, fund equity investment, with finance, tax as leverage, through the government purchase guide small and medium-sized enterprises, small micro enterprises and service platform cooperation, through pilot demonstration, cultivate emerging service Internet platform.

(3) Improve the organization and coordination mechanism, coordinate and coordinate at the various levels, make use of the joint meeting policies of the pilot reform of free trade zones, and give timely guidance. At the same time, the typical practices are promoted and publicized. Use the regional linkage mechanism and collaborative development and collaborative governance mechanism to form industrial agglomeration for exchanges in industrial migration and flow of factors, and form a scale effect.

System is open, deepen industrial integration

(1) Further improve the negative list management system, the negative list and stabilize foreign capital, expand domestic demand, promote structural transformation, classification relax restrictions, guide foreign investment, steadily handle the relationship between industrial attributes, business attributes and ideology, sensitive industries such as the Internet, culture, education, should not only to keep the bottom line, but also to prevent safety generalization. We will improve the dynamic formulation and adjustment mechanism for the negative lists, Enhance the authority and seriousness, Only reduce but not increase, Really make government departments "cannot be done without law", Improve the management system for the negative list of cross-border trade, With a "negative list" as the traction, We will steadily advance the reform of separating licenses and licenses, Optimize the approval services, Using data sharing, Closely promote the construction of a digital government, Innovative service platform, To realize the interaction mechanism of industry and commerce, taxation, and other public security, Special agencies have been set up (such as Chongqing Big Data Application Administration) to manage artificial intelligence, big data, information, social public information management, and promote the reform of "separation of licenses" in an orderly manner.

(2) Improve the ongoing and post-event supervision system matching with the negative list. According to the characteristics of the industry, improve the service dynamic policy system, do "remedy to the case", improve the supervision system construction, put an end to regulation, while detailed administrative discretion adhering to the basic principle of prudent tolerance, will maintain the market order in place, the e-government and wisdom governance as a means and foothold, establish and improve the credit-based enterprise credit system, improve service efficiency.

(3) Based on the reform of telecommunications industry, select businesses not related to national security; gradually relax the restrictions of foreign shareholding ratio to mobilize more international resources for our use, thus improve the underlying conditions of China's network infrastructure and promote the deep integration of digital economy and service industry.

(4) Improve the protection mechanism for foreign investment, clean up the unreasonable mechanism for foreign investment, revise industrial guidance and country guidance in the service industry and personnel entry and exit flow, enhance the supply of effective public services in foreign investment, build an overseas risk monitoring and early warning system, and guide enterprises to prevent and defuse risks.

(5) Establish a mechanism for promoting international

 DOI: http://doi.org/10.26549/jfr.v5i2.8595

exchanges in the service industry and learn from international experience. Close cooperation with relevant international organizations, the benchmarking countries in the international service industry, deep understanding of OECD countries, especially the benchmarking countries promote service opening and reform, use the existing regional free trade zone agreement (such as "area", China, Japan and South Korea free trade zone) to optimize the layout of international resources, promote the service industry realize industrial chain integration. At the same time, we will increase the publicity of China's policy of opening up the service industry, and encourage the international community to timely understand the latest developments in China's service industry.

Improves the development conditions and optimizes the business environment

(1) Promote the construction and application of service data standards, guide industry organizations and enterprises to research and formulate industry data industry standards, group standards, clear public data collection, exclusive, sharing, at the same time clear "rights —— obligations" relationship between government and enterprise, build data sharing mechanism between government and enterprise, guarantee legal compliance of data collection and data, and prevent enterprises to use public data monopoly, for personal gain.

(2) Speed up the combination of digital economy and traditional service industry, establish a special fund for digital service industry, the use of short video platform, electricity platform, with big data insight service demand, communication, Internet of Things, big data, blockchain and other new technologies into the traditional service industry, give full play to the demonstration effect of leading enterprises, promote the enterprise technology iteration. We will promote cooperation with telecom operators, China UnionPay and other large enterprises to optimize the underlying conditions for product innovation and technological innovation. At the same time, the leading enterprises to the industrial chain to improve the collaborative innovation system, improve the industrial policy to encourage small and medium-sized enterprises, establish a unified technology market trading system and supporting scientific and technological achievements transformation incentive policy, to promote industrial structure upgrading: at the same time actively promote foreign advanced management mode, blade inward, stimulate enterprise endogenous power.

(3) We will gradually promote the orderly opening up of government public data, promote the institutional supply-side reform of "big data + public services", and build a national platform for the unified opening up of public data. The government digitalization will be gradually extended to towns, streets and grass-roots level, publicizing the credit information of all market entities in operation timely and accurately, and using the data network to gradually achieve "released by one party and shared by the three parties".

References

[1] Topscott,Don. The digital economy: Promise and peril in the age of networked intelligence [M]. New York: McGraw-Hill,1996..

[2] Xue Weixian, Feng Zongxian, Wang Jianqing. Design of China Network Economy Level Measurement Index System [J]. China Soft Science, 2004 (08): 51-59.

[3] Wang Qingxi, Zhang Xin, Xin rose. Digital Economy and High Quality Development Research of Zhejiang Province —— based on spatial panel data [J]. Journal of Zhejiang University of Technology (Social Sciences Edition), 2021 (01): 42-49.

[4] Zhang He, Bai Qinxian. Does digital inclusive finance reduce the income gap between urban and rural areas? —— panel threshold regression analysis based on Chinese provincial data [J]. Economic problem exploration.2018 (10): 122-129.

[5] Li Yonghong, Huang Rui. Research on digital industrialization and industrial digital mode in China [J]. Science and Technology Management Research, 2019 (16): 129-134.

[6] Xiao Xu, Qi Yudong. Value dimension and theoretical logic of industrial digital transformation [J]. Reform, 2019 (08): 61-70.

[7] Wu Fuxiang. Review of the Development of Digital Economy in Yangtze River Delta. [J] People's Forum. Academic Frontier, 2020 (17): 58-65; 87.

[8] Zhu Youliang, Wang Chunjuan. Industrial digital transformation under the background of "double cycle" new development strategy: Theory and Countermeasures [J]. Economics, 2021 (03): 14-27.

[9] Yuan Yijun, Liu Hao, Bai Nan. China producer factor productivity measure —— based on nonparametric Malmquist index method [J]. China Soft Science, 2009 (01): 159-167.

[10] Zhang Zhibin, Zhang Yingfeng. Analysis of total factor productivity measurement and its interregional differences of China's producer services [J]. Technical economy, 013 (08): 69-74.

[11] Yan Yutong, Wang Haisu. Optimization and evaluation of total factor productivity in China's medical service industry [J]. Statistics and Decision Making, 2021 (07): 63-66.

DOI: http://doi.org/10.26549/jfr.v5i2.8595

[12] Hu Yanhui. Analysis of total factor productivity and influencing factors of the service industry [J]. Statistics and Decision Making, 2013 (05): 103-106.

[13] Ping Xinqiao, Enron, Huang Xin. Total factor productivity decision of China's service industry and its impact on manufacturing [J]. Academic Studies, 2017 (03): 79-88.

[14] Fang Yuanping, Bi Dou, Chen Hongyang, Peng Ting. Space effect of knowledge-intensive service industry agglomeration on tourism innovation in urban agglomeration [J]. The Geographical Journal, 2020-08-04.

[15] Yang Huimei, Jiang Lu. Digital economy, spatial effect and total factor productivity [J]. Statistical studies 03-31.2021.

[16] Zhang Jun, Wu Guiying, Zhang Jipeng. China Interprovincial Material Capital Stock estimate: 1952-2000 [J]. Economic Studies, 2004 (10): 35-44.

[17] Hall R E,Jones C I. Why do some countries produce so much more output per worker than others? [J]. The Quarterly Journal of Economics,1999,114(1):83-116..

[18] Innovation and Development Research Department of the Development Research Center of the State Council. Digital Transformation: Development and Policy [M.] Beijing: China Development Press, December 2019.

[19] Wang Wei, Liu Tao, etc.. Service industry: Institutional opening up to deepen reform [M]. Beijing: China Development Press, 2020.8.

Appendix:

Measurement results of China from 2007-2019

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Beijing	0.6933	0.6725	0.6858	0.6963	0.6817	0.6774	0.7243	0.7121	0.7193	0.6850	0.6811	0.6721	0.6064
Tianjin City	0.0806	0.0958	0.0884	0.0916	0.0949	0.0965	0.0998	0.1001	0.1066	0.1091	0.1110	0.0910	0.0763
Hebei Province	0.1972	0.2127	0.2054	0.2147	0.2081	0.2179	0.2307	0.2228	0.2340	0.2338	0.2514	0.2211	0.1999
Shanxi Province	0.1175	0.1214	0.1216	0.1271	0.1258	0.1244	0.1413	0.1277	0.1437	0.1317	0.1261	0.1131	0.1087
Inner Mongolia	0．1080	0.1191	0.1126	0.1275	0.1354	0.1348	0.1464	0.1427	0.1391	0.1385	0.1261	0.1101	0.0980
Liaoning Province	0.2243	0.2323	0.2160	0.2296	0.2285	0.2354	0.2426	0.2391	0.2614	0.1897	0.1873	0.1527	0.1298
Jilin Province	0.1121	0.1216	0.1175	0.1193	0.1134	0.1151	0.1189	0.1073	0.1074	0.1056	0.1072	0.1096	0.1008
Heilongjiang Province	0.1414	0.1556	0.1519	0.1608	0.1531	0.1496	0.1658	0.1609	0.1685	0.1607	0.1632	0.1517	0.1414
Shanghai	0.3268	0.3278	0.3111	0.3036	0.2976	0.3184	0.3102	0.3304	0.3516	0.3146	0.3245	0.3131	0.3252
Jiangsu Province	0.4226	0.4285	0.3971	0.4401	0.4349	0.4428	0.4258	0.4441	0.4624	0.4669	0.4602	0.4319	0.4074
Zhejiang Province	0.3193	0.3040	0.2662	0.2813	0.2752	0.2901	0.3096	0.3212	0.3762	0.3668	0.3979	0.3831	0.3821
Anhui Province	0.1702	0.1714	0.1659	0.1749	0.1748	0.1860	0.1814	0.1781	0.1962	0.1827	0.1870	0.1760	0.1667
Fujian Province	0.1786	0.1743	0.1622	0.1795	0.1784	0.1856	0.1889	0.1720	0.1841	0.1801	0.1768	0.1669	0.1649
Jiangxi Province	0.1125	0.1153	0.1089	0.1154	0.1124	0.1187	0.1165	0.1123	0.1284	0.1254	0.1377	0.1188	0.1372
Shandong Province	0.3246	0.3510	0.3411	0.3598	0.3561	0.3538	0.363	0.3592	0.3747	0.3693	0.3745	0.3435	0.3245
Henan Province	0.2304	0.2587	0.2400	0.2663	0.2527	0.2553	0.2855	0.3052	0.2725	0.2629	0.2644	0.2735	0.2709
Hubei Province	0.2257	0.2259	0.2178	0.2209	0.2191	0.2245	0.2363	0.2249	0.2405	0.2316	0.2208	0.2106	0.2034
Hunan Province	0.1728	0.1824	0.1702	0.1783	0.1843	0.1882	0.2062	0.2047	0.2233	0.2202	0.2487	0.2457	0.2417
Guangdong Province	0.5401	0.5346	0.5095	0.5069	0.5171	0.5215	0.4846	0.4612	0.4914	0.4994	0.5005	0.4977	0.4446
Guangxi Province	0.1357	0.1368	0.1372	0.1524	0.1504	0.1519	0.1619	0.1490	0.1602	0.1586	0.1814	0.1851	0.1643
Hainan Province	0.0163	0.0178	0.0190	0.0243	0.0239	0.0247	0.0245	0.0218	0.0252	0.0278	0.0265	0.0265	0.0268
Chongqing	0.0885	0.0911	0.0873	0.0951	0.0947	0.1025	0.1082	0.0993	0.1130	0.1129	0.1154	0.1255	0.1389
Sichuan Province	0.3120	0.3226	0.3296	0.3285	0.3219	0.3317	0.3615	0.3639	0.3890	0.3904	0.4004	0.3670	0.3798
Guizhou Province	0.0844	0.0835	0.0753	0.0862	0.0970	0.1014	0.1107	0.1061	0.1043	0.0991	0.1063	0.1092	0.1095
Yunnan Province	0.1346	0.1315	0.1222	0.1366	0.1412	0.1432	0.151	0.1466	0.1689	0.1735	0.1826	0.1849	0.1892
Shaanxi Province	0.2384	0.2398	0.2299	0.2328	0.2300	0.2330	0.2514	0.2320	0.2387	0.2342	0.2261	0.0261	0.0279
Gansu Province	0.0826	0.0863	0.819	0.0929	0.0944	0.0945	0.1071	0.0931	0.1005	0.0957	0.0949	0.2215	0.2102
Qinghai Province	0.0219	0.0255	0.0223	0.0343	0.0342	0.0398	0.0449	0.0444	0.0473	0.0486	0.0504	0.0869	0.0812
Ningxia Province	0.0125	0.0141	0.0138	0.0174	0.0175	0.0178	0.0202	0.0197	0.0213	0.0199	0.0208	0.0418	0.0369
Xinjiang Province	0.0912	0.0964	0.0821	0.0974	0.0978	0.1032	0.117	0.1124	0.1033	0.1009	0.1044	0.0223	0.0229

 DOI: http://doi.org/10.26549/jfr.v5i2.8595

SYNERGY PUBLISHING PTE. LTD

Journal of Finance Research

https://ojs.s-p.sg/index.php/jfr

The Research on Total Factor Productivity of Soybean in China

Yuanchun Chen*

Business School, Zhengzhou University of Industrial Technology, Zhengzhou, Henan, 451100, China

ARTICLE INFO

Article history
Received: 1 June 2021
Revised: 15 July 2021
Accepted: 20 October 2021
Published Online: 30 October 2021

Keywords:
Soybean
Productivity
China

ABSTRACT

This paper uses the panel stochastic frontier model to study the total factor productivity of Chinese soybean. The research shows that the impact of direct cost and labor cost on yield is positive and significant, the impact of indirect cost on yield is not significant, and the impact of cash cost on yield improvement is negative.

1. Literature Review

In terms of agricultural total factor productivity, the main methods to study the growth rate of total factor productivity are so low residual method, envelope analysis and stochastic frontier method. There are many literature applying these three methods to agriculture. Fu Xiao-xia and Wu Li-xue [1] reviewed the development of stochastic frontier production function model and its application in China's productivity analysis; Zhang Yong-xia [2] used the index method to calculate the growth rate of China's agricultural total factor productivity and the growth rate of provincial agricultural total factor productivity, and analyzed the growth factors of agricultural total factor productivity by using panel data model and production function method; Zhang Le, Cao Jing [3] introduced the change of allocation efficiency into the stochastic frontier production function as a variable to measure China's agricultural total factor productivity from 1991 to 2010; Zhu Xuehong, Zeng Yi, Feng Chao [4] analyzed China's total factor productivity (TFP) from the national,regional and provincial levels by using the framework of "environmental technology" in combination with the directional distance function and the three-level production frontier function. The research shows that China's TFP is at a low level, and the gap between regions and industries is obvious; Hao Xiao-yan, Zhang Yi, Han Yi-jun [5] used time-varying decay SFA model and double threshold model to test the impact of China's import and export trade of agricultural products on agricultural total factor productivity; Gong Bin-lei [6] integrated five productivity analysis models by using the knife cutting model average method to obtain a more comprehensive and accurate productivity estimation method, and analyzed the internal structure of China's agricultural growth from 1990 to 2015; Yang Qian, Wang Yu, Li Chao and Liu Xinpeng [7] believed that the progress of China's agriculture can't be completely measured only by agricultural total factor productivity, and the impact on the environment should also be considered. Through the research on agricultural green total factor productivity,

**Corresponding Author:*
Yuanchun Chen,
Business School, Zhengzhou University of Industrial Technology, Zhengzhou, Henan, 451100, China;
Email: yuancc20180211@outlook.com

DOI: http://doi.org/10.26549/jfr.v5i2.8696

this paper empirically analyzed the driving factors of lawyer TFP differentiation. In this paper, the stochastic frontier method is used for analysis.

2. Theoretical Models and Data Sources

(1) Theoretical model

The panel stochastic frontier model is used to study the total factor productivity of soybean:

$$lny_i = \beta_0 + \sum_{k=1}^{k} \beta_k lnx_{ki} + v_i - u_i \qquad u_i \geq 0 \tag{1}$$

Where, $u_i \geq 0$ is the invalid rate item, v_i refers to the specific error.According to whether the invalidity item u_i changes over time, the panel random frontier model is divided into the following two categories:

(2) Technical efficiency don't change with time

Then equation (1.1) can be transformed into:

$$lny_{it} = \beta_0 + \sum_{k=1}^{k} \beta_k lnx_{kit} + v_{it} - u_i \qquad u_i \geq 0 \tag{2}$$

If u_i is related to x_i, it is a fixed effect model, and the equation is as follows:

$$lny_{it} = \beta_{0i} + \sum_{k=1}^{k} \beta_k lnx_{kit} + v_{it} \tag{3}$$

Here, $\beta_{oi} \equiv \beta_0 - u_i$ is the unique intercept item of enterprise i.

If u_i is not related to x_i, it is a random effect model, which can be estimated according to Equation (2).

(3) Technical efficiency changes over time

Due to the rapid development of science and technology in recent years and the obvious progress of science and technology in soybean production, the invalid rate terms in different regions and at different times are constantly changing. The formula is as follows:

$$u_{it} = e^{-\eta(t-T_i)} u_i$$

Where, T_i is the time dimension of enterprise i, η is the parameter to be estimated, and $u_i \sim N^+(\mu, \sigma_u^2)$. Equation (4) becomes a time-varying attenuation model. The above three cases basically cover all cases of SFA, and stata14 is used for estimation below. The data comes from *the cost-benefit statistical yearbook of China's agricultural products*(2005-2018).

3. Empirical Research

Since the input factors in the actual soybean production include manpower, chemical fertilizer, pesticide, machinery, technology, etc., for convenience of explanation and limited to the availability of statistical data, the data used in this paper comes from the cost-benefit statistical yearbook of China's agricultural products over the years, and the relevant input items are also subject to the statistical data, The items of these statistics may be omitted or can't be obtained, but the items that have been obtained have covered the main influencing factors of soybean production. Therefore Equation (2) can be rewritten as:

$$lny_{it} = \beta_0 + \sum_{k=1}^{k} \beta_k lnx_{kit} + v_{it} - u_i$$

Here t refers to the time span from 2005 to 2018; i refers to various provinces, including 1 Hebei, 2 Shanxi, 3 Inner Mongolia, 4 Liaoning, 5 Jilin, 6 Heilongjiang, 7 Anhui, 8 Shandong, 9 Henan, 10 Chongqing and 11 Sanxi. K refers to each sub cost breakdown item. This refers to the gross output value. The impact of inflation isn't taken into account here.

$$lny_{it} = \beta_0 + \beta_1 lnx_{1it} + \beta_2 lnx_{2it} + \beta_3 lnx_{3it} + \beta_4 lnx_{4it} + \beta_5 lnx_{5it} + v_{it} + u_i \tag{4}$$

Here k represents the input cost, where 1 represents direct cost, 2 represents indirect cost, 3 represents labor cost, 4 represents land cost and 5 represents cash cost. The unit here is 50 kg, not mu, that is, the relationship between soybean output per 50kg and relevant input cost is studied here, and the corresponding data is obtained by conversion.

Table 1. Statistics of Regression Results by Different Methods

	Fixed effect model	Random effect model	Time varying attenuation model of random effects
β1	0.7361 (0.2184)	0.6176 (0.1333)	0.2617 (0.0866)
β2	-0.0266 (0.085)	0.002979 (0.01797)	0.0292 (0.01014)
β3	0.06204 (0.03274)	0.1303 (0.02322)	0.0699 (0.01623)
β4	0.1793 (0.05124)	0.1951 (0.03721)	0.0456 (0.029)
β5	-0.5782 0.1829	-0.6457 (0.12669)	-0.4026 (0.08562)
β0	3.8751 (0.2777)	4.3787 (0.2241)	5.5544 (0.17494)
η	/	/	0.5535

As can be seen from the above Table 1, the coefficients estimated by various methods are partially significant. And the time span is 14 years, and η is 0.5535, indicating that the technical efficiency changes with time. From the above estimate, we can see the coefficient of direct cost β1, the impact on yield is positive and significant. Direct costs mainly include seed costs, the use of various fertilizers and the use of machinery. Obviously, the increase of these direct costs has a positive effect on the improvement of yield, which is in line with basic common sense. Coefficient of overhead β2,the estimates are not significant and the symbols are different. Indirect costs mainly include depreciation and financial costs. These

 DOI: http://doi.org/10.26549/jfr.v5i2.8696

costs basically change little every year. The continuous increase of indirect costs will not have a great impact on the output. Coefficient of labor cost β3 is significant. It is obvious that the strength is not so large, because the improvement of technology has replaced labor to a certain extent. Coefficient of cash cost β5, the impact on the increase of output is negative, and the greater capital cost does not result in the increase of output. Through the above analysis, we can know that the technical efficiency of soybean in China has been improved in recent years, but the speed of improvement is different due to different regions. Because the northeast is a plain area, which is suitable for the development of large-scale machinery, the technical efficiency is a little higher, while Chongqing is in mountainous areas, which is not suitable for large-scale mechanization, so the technical efficiency is not easy to improve.

References

[1] Fu Xiaoxia, Wu Lixue, "development of Frontier methods of stochastic production and its application in China", Nankai Economic Studies, 2006 (02): pp130-141.

[2] Zhang Yongxia: Measurement and empirical research on China's agricultural productivity, Doctoral Dissertation of the Graduate School of the Chinese Academy of Agricultural Sciences, 2006.

[3] Zhang Le, Cao Jing: China's agricultural total factor productivity growth: introduction of changes in allocation efficiency -- An Empirical Study Based on stochastic frontier production function method, China's Rural Economy, 2013 (3), pp. 4-15.

[4] Du Jiang: China's agricultural total factor productivity growth and its temporal and spatial differentiation, Scientific Research Management, 2015. 36 (05), pp. 87-98.

[5] Zhu Xuehong, Zeng Yi, Feng Chao: "industrial heterogeneity, regional differences and spatial layout optimization of China's total factor productivity", Business Research, 2016 (05), pp. 1-8.

[6] Gong binlei: Research on the contribution of input factors and productivity to China's agricultural growth, Agricultural Technology and Economy, 2018 (06), pp. 4-18.

[7] Yang Qian, Wang Yu, Li Chao, Liu Xinpeng: spatial differentiation and driving factors of China's agricultural green total factor productivity, Research on Quantitative and Technical Economy, 2019.36 (10), pp. 21-37.

DOI: http://doi.org/10.26549/jfr.v5i2.8696

About the Publisher

Synergy Publishing Pte. Ltd. (SP) is an international publisher of online, open access and scholarly peer-reviewed journals covering a wide range of academic disciplines including science, technology, medicine, engineering, education and social science. Reflecting the latest research from a broad sweep of subjects, our content is accessible worldwide – both in print and online.

SP aims to provide an analytics as well as platform for information exchange and discussion that help organizations and professionals in advancing society for the betterment of mankind. SP hopes to be indexed by well-known databases in order to expand its reach to the science community, and eventually grow to be a reputable publisher recognized by scholars and researchers around the world.

SP adopts the Open Journal Systems, see on http://ojs.s-p.sg

Database Inclusion

Asia & Pacific Science Citation Index

Creative Commons

China National Knowledge Infrastructure

Google Scholar

Crossref

MyScienceWork

SYNERGY
PUBLISHING PTE. LTD.
Tel: +65 65881289
E-mail: contact@s-p.sg
Website: ojs.s-p.sg

ISSN 2591-7137
02
9 772591 713218