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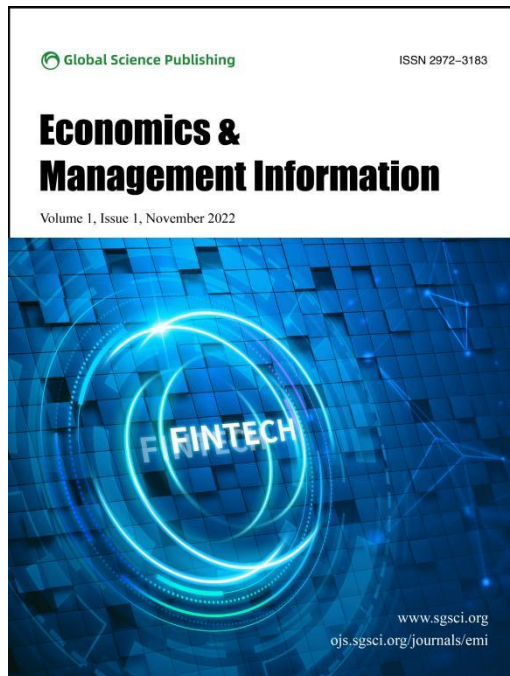
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Aims & Scope

Economic & Management Information (EMI), founded in 2022, is an internationally distributed business journal that publishes original, peer-reviewed business research. Publishing theory and practice research of international significance in all business disciplines, we strive to bring together business experts and scholars in business to share their work as quickly and widely as possible to promote business development and benefit society as a whole, and to make business scholars, policymakers, and teachers can gain local area influential research.

EMI offers broad manuscript coverage and will publish all the economic and management of the enterprise management, the regional economic, financial and human resources management and so on various aspects of the original research, including the following: original research papers, review articles (both narrative and

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Editorial

Fear Not the Strong Pass Iron-Clad on All Sides, The Summit's Now Surmounted With Big Strides

After intensive preparation and joint efforts of the Singapore team and the Chinese team, the first phase of *Economics & Management Information* was launched. What kind of journal should *Economics & Management Information* be? I hope its first feature is inclusiveness. The core of inclusiveness lies in advocating diversified development and encouraging individual advantages. To make academic achievements in the fields of economy, management, finance, human resources and organizational behavior, journals, reviewers and authors need to jointly choose and practice the inclusive orientation. This magazine regards inclusion as the first key label in its inaugural period, and will innovate the selection criteria from four aspects of the paper's genre, topic selection, methods and results, so as to promote the inclusive development trend of economic and management research.

First of all, we include theoretical articles that are reasonable but lack empirical evidence. Empirical method is the mainstream research method in recent years, but the academic worries caused by excessive "modeling" have attracted the attention of scholars. This magazine values articles that are logical and have made outstanding contributions, these papers put forward important topics, review rich literature, deduce convincing conclusions or put forward feasible suggestions, which are of high value and significance. This is a kind of tolerance of this journal to the paper genre.

Second, we include topics that are novel but somewhat niche. For a long time, the research in the field of economy and management has followed the hot spots in the field of theory and practice, but the hot spots are not necessarily the focus of the research. Some hot spots cannot stand the test of time and disappear. This magazine encourages those hot topics and classic topics that are strictly selected, and also encourages original topics derived from global practical problems, even if they are slightly niche and have unknown prospects.

Third, we include research methods that are scientifically rigorous and slightly flawed. The overemphasis on the scientific nature makes the research methods of the thesis more and more complicated, but this orientation itself is also being questioned. This magazine tries to include various qualitative and quantitative research methods, and comprehensively consider the overall value of articles.

Fourth, we include research results that are true but not perfect. It is not easy for all assumptions in the theoretical model to be supported by data. Young scholars are often trapped in data flaws. The favor of journals for perfect conclusions is also the initiator of some academic misconduct. The insignificant path relationship itself is also a research discovery. Just like Edison had experienced 2500 failures before he discovered tungsten wire, each failure is significant. This magazine advocates the authors to report the true research results.

Like a baby, this magazine is still in its infancy. If we are still confident in pursuing higher standards, I hope that the editor can select articles expressing concern about social realities and research issues full of new ideas and practical values.

The development and promotion of this magazine cannot be separated from the support of all authors, reviewers and readers. It will be the result of collective wisdom and concerted efforts. We are willing to witness the transformation process of this era and the common progress of the global academic community.

Hui Cheng

Written in Guangdong Province, China

September 20, 2022

Seize the Opportunity of a New Round of Kangbo Cycle to Build Guangdong's New Energy Automobile Industry

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Abstract: Based on the theory of Kang Bo cycle, based on the long-term observation of the new energy automotive industry of guangdong province and the survey data, from the aspects of economy, science and technology innovation, double carbon strategy as well as the contribution to the international trade and so on four aspects this paper expounds the construction of the importance of new energy vehicles industry in guangdong, lists the problems and difficulties of industrial development, Some solutions and suggestions for future research are put forward.

Keywords: kangbo period; new energy automobile; transformation and upgrading

1. Forward

With the progress of science and technology, economic development has a certain periodicity. As early as in the Communist Manifesto, Marx pointed out the great role of technological innovation in promoting economic development. From 1922 to 1925, Nikolai D. Kondratiev, an economist of the former Soviet Union, found through the analysis and empirical research on the economic data of Britain, France, the United States, Germany and other European and American countries that there were long-term fluctuations with an average length of 50 years in the economic development process of European and American developed countries. Academics named this cyclical fluctuation "Kondratiev Cycle", or "Kangbo Cycle" for short. Joseph Alois Schumpeter, an Austrian economist, further put forward the "long wave theory of technological innovation" (1939) on the basis of the "Kangbo cycle", revealing the attributes of technological innovation in the long cycle fluctuations of the economy. He believed that technological innovation was the root of the long wave rise, and the diffusion of technology between different regions had an important impact on the long wave synergy between regions.

From the First Industrial Revolution, the four Kangbo cycles experienced by the capitalist era basically coincided with the development process of the four industrial revolutions. The long-term fluctuations of the economy were dominated by technological innovation, and were also deeply affected by the economic cycle: when a large number of technological innovation achievements spilled over and spread to the economic system, the market flourished and capital expanded. When the market was satisfied with capital proliferation and ignored innovation, the foam burst and the economy declined, Circulate until entering the next "Kangbo cycle" (Li Wan [1] 2020). In the previous rounds of "Kangbo cycle", European and American capital host countries seized the historical opportunities and continued to rise. At the critical historical stage of the current fourth "Kangbo cycle" entering the fifth "Kangbo cycle", disruptive technologies and disruptive innovations emerge in endlessly

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(Hu Zhihao, Song Guokai [2], 2019). Although China is facing problems such as insufficient economic growth momentum and huge pressure on social structure adjustment, We will still firmly seize the favorable opportunity of the transition from the industrial age to the information age, and strive to create new opportunities for the development of the new era. As the leading area and front position of China's reform and opening up, Guangdong should play a greater role in the journey of the new era, take the lead in promoting industrial transformation and upgrading with scientific and technological innovation, provide continuous power for sustained and stable economic growth, and strive to draw a picture of Guangdong in the new era of high-quality development.

2. Importance of building new energy automobile industry in Guangdong

Although there is no final conclusion on the field of technological innovation and development trend to promote a new round of "Kangbo cycle", "green and low-carbon" has become the basic consensus of all mankind on building a community with a shared future for mankind in the new era. With the "double carbon" goal solemnly announced by China to the world in September 2020, "green science and technology" and "green economy" have become important hands of governments at all levels from the central to local levels. In the face of important historical opportunities, Guangdong Province should also actively adjust its industrial planning and formulate medium - and long-term development strategies. Among the existing advantageous industries and emerging industries, the new energy automobile industry is expected to play an important role in helping Guangdong continue to maintain its leading position in the scientific, technological and economic fields.

2.1. Economic significance of new energy vehicle industry

The new energy vehicle industry is expected to catch up with real estate and become a new pillar of the national economy (Fang Jianhua [3], 2022). According to statistics, China's vehicle manufacturing industry will account for 7.92% of GDP in 2020, which is 7.34% higher than that of real estate. With the promotion of the "dual carbon" goal, new energy vehicles will become the main part of the automobile manufacturing industry. Due to the longer industrial chain of new energy vehicles and the linkage with photovoltaic, energy storage and other industries, they will create greater market value. In 2021, China will sell 3.521 million new energy vehicles, ranking first in the world for seven consecutive years(Wu zheng, Liu jinzhou & Wu xiqing [4], 2022). It is estimated that by 2025, the number of new energy vehicles in China will reach 39.4 million, and the market size will reach more than 5 trillion. Its supporting industries, such as charging piles and new energy power generation, will all have a market size of trillion (Peng Hua [5], 2019).

The new energy vehicle industry has a huge multiplier effect on economic development. It is estimated that when the government's expenditure on the new energy vehicle industry increases by 1 million yuan (RMB), the national income will increase by 5 million yuan (RMB) (Gao xiuping [6], 2018). A study by the Development Research Center of the State Council shows that one unit of output of the vehicle industry can drive the overall increase of 10 units in all sectors of the national economy. This huge multiplier effect cannot be replaced by any other industry.

The new energy vehicle industry is expected to become a new growth point to increase government revenue. Although the direct contribution of the new energy vehicle industry to government revenue is not significant globally, for example, Tesla's state tax bill in the United States in 2021 will be only \$9 million, and the federal tax bill will be zero. However, in terms of personal income tax, Tesla's "leader" Mask will pay \$11 billion in taxes for the United States federal government. BYD, the leading enterprise of new energy vehicles in Guangdong Province, will pay a total tax of 3.035 billion yuan in 2021, which is far lower than the 5.867 billion yuan of financial subsidies at all levels that it received that year, but its contribution to government finance in other aspects cannot be underestimated. It is believed that after the industry matures in the future, the new energy automobile industry will inevitably become a stable tax source of government revenue.

2.2. Scientific and technological innovation significance of new energy vehicle industry

The new energy vehicle industry is a typical technology intensive and capital intensive industry, which has an extremely important positive effect on scientific and technological innovation in the new era, and can greatly

offset the crowding out effect and negative effect on scientific and technological innovation during the recession of traditional industries such as real estate. The new energy vehicle industry has a distinctive feature of joint development with high-end manufacturing, new materials, big data, artificial intelligence and other emerging technologies, which can inject new momentum into improving the overall efficiency of the innovation chain and strengthening the real economy. The new mode and new business form surrounding the development of new energy vehicle industry will also promote the innovation of business model, and further promote profound changes in vehicle product form, industrial chain ecology, transportation mode, energy consumption structure and other fields.

Guangdong's new energy vehicle industry has begun to take shape, and its scientific and technological innovation ability is among the best. By the end of 2021, there are 42300 new energy vehicle related enterprises in the province (400000 in China), and the number of new energy vehicle patents obtained is nearly 12000, ranking second in the provincial administrative region. As the leading enterprise of domestic new energy vehicles, BYD has ranked first in the innovation list of China's new energy vehicle enterprises with 9426 patents by June 2021, surpassing the sum of the second and third places. BYD's technology transformation capability is even more outstanding. It has realized the commercialization of core technologies in the fields of new energy vehicle architecture platform, blade battery and management module, Internet of Vehicles system, etc. Relevant models continue to sell well, ranking first in the sales volume of domestic new energy vehicles all the year round. The development of the new energy vehicle industry in Guangdong is conducive to fully mobilizing the advantages of the Guangdong-Hong Kong-Macao Greater Bay Area in terms of industrial foundation, financial center, human resources, scientific and technological research and development, becoming an important force to promote innovation in other industries, and making great strides towards the goal of building an industrial scientific and technological innovation center with global influence, an advanced manufacturing base with international competitiveness, and a two-way open hub with world cohesion.

2.3. The new energy vehicle industry is an important hand to realize the "double carbon" strategy

In the process of historical development, the automobile revolution has always been accompanied by the energy revolution. At present, China and even the world are facing the third energy revolution in the transition from fossil energy to renewable energy. The global energy structure is making great strides towards green and low-carbon. The electrification of the automobile industry is complementary to the development of clean energy technologies such as wind, light, tidal power generation, nuclear energy comprehensive utilization and hydrogen energy development. It is predicted that with the increase of renewable energy power generation, the carbon emissions per unit mileage of pure electric passenger vehicles will be reduced to 20g/km in 2035, more than 70% lower than that in 2021. In 2035, new energy vehicles will reduce carbon emissions in road traffic by about 200 million tons, with significant carbon reduction benefits. The development of new energy vehicles will help to achieve the goal of carbon peak and carbon neutral as soon as possible.

2.4. Contribution of new energy vehicle industry to international trade

The automobile industry occupies an important position in international trade. According to McKinsey's calculation, the total market size of the global automobile industry is expected to increase to about 6700 trillion US dollars by 2030 (Mc Kinsey [7], 2021). China's new energy automobile industry has obvious advantages of backwardness and huge export potential. From the perspective of the rise and fall cycles of major countries in the world in history, the automobile industry is the most critical factor determining whether a country or region can have core competitiveness in traditional manufacturing. As a major foreign trade province, Guangdong Province can continue to maintain its leading position in reform and opening up only by creating more internationally competitive commodities.

At present, China has become the world's largest consumer market for electric vehicles. The cumulative sales of electric passenger vehicles account for 45% of the global total, and the sales of electric buses and electric trucks account for more than 90% of the global total; China has built more public charging piles than the United States, Europe and Japan combined; With leading mass production power battery technology, China is the most

active region in the innovation of electric travel business model worldwide. In the process of global automobile electrification, China took the lead in taking an important step, occupying the first mover advantage, and greatly enhancing the confidence of enterprises and the nation.

To sum up, the scientific and technological innovation of the current new energy automobile industry is more significant than its economic significance, but it has obvious supporting effect on economic development and huge potential. Vigorously cultivating and developing the new energy automobile industry can make it a new growth point of Guangdong's economy and drive the development and upgrading of its related industries.

3. Importance of building new energy automobile industry in Guangdong

3.1. Industrial guidelines need to keep pace with the times

Although as early as June 2018, the People's Government of Guangdong Province released the Opinions on Accelerating the Innovative Development of the New Energy Vehicle Industry [8], which laid out the new energy vehicle industry earlier, the main target set at that time was 2018–2020, which could not adapt to the new situation. Especially in November 2020, the General Office of the State Council issued the New Energy Vehicle Industry Development Plan (2021–2035) [9], outlining a new blueprint for the development of the next generation of new energy vehicle industry. In order to further seize the commanding heights of a new round of industrial reform and cultivate new driving forces for economic development, local governments are accelerating the layout, strengthening the guidance and support of corresponding policies, and actively promoting the promotion and application of the next generation of new energy vehicles and the construction of an industrial ecosystem. In February 2021, the Shanghai Municipal Government issued the Implementation Plan of Shanghai to Accelerate the Development of the New Energy Vehicle Industry (2021–2025) [10]. In November 2021, the Jiangsu Provincial Government issued the "Fourteenth Five Year Plan" for the Development of the New Energy Vehicle Industry in Jiangsu Province [11]. The latest in Guangdong Province is only December 2021. The Guangzhou Municipal Development and Reform Commission issued the "Fourteenth Five Year Plan" for the Innovative Development of Intelligent and New Energy Vehicles in Guangzhou [12], lacking top-level design, it will directly restrict the future development of the new energy vehicle industry in Guangdong Province. Guangdong urgently needs to formulate the new energy vehicle industry plan according to the new national industrial plan and the actual situation of the province.

3.2. The industry is large but not strong, and the development encounters bottlenecks

The new energy vehicle industry in Guangdong Province is large in scale and growing rapidly. In 2021, the new energy vehicle production will reach 535400 units, the sales volume will reach 414000 units, and the production and sales volume will reach a new record high. However, from a nationwide perspective, the advantages are not obvious. After entering 2020, the new energy vehicle industry in the Guangdong Hong Kong Macao Bay Area will encounter bottlenecks in terms of technical level and promotion and application, and the growth rate will slow down. In that year, it was surpassed by Shanghai for the first time, in the same year, the output of new energy vehicles in neighboring Guangxi achieved nearly twice the year-on-year growth rate, and the output is close to that of Guangdong. In 2021, the output of new energy vehicles in Liuzhou, Guangxi alone will reach 482000, approaching the output of new energy vehicles in Guangdong Province.

In addition, the new energy vehicle industry in Guangdong Province mainly focuses on the production of hybrid and pure electric vehicles, lacking in energy types, and the field of hydrogen fuel cell vehicles is basically blank. In November 2020, the Guangdong Provincial Government issued the "Implementation Plan for Accelerating the Development of the Hydrogen Fuel Cell Vehicle Industry in Guangdong Province", and began to actively explore the development of hydrogen energy. However, on the whole, policies and practices have lagged behind other provinces. The lagging development of Guangdong in the field of hydrogen fuel cell vehicles is inconsistent with its position as a strong province of new energy vehicles. In recent years, Guangdong has vigorously promoted hydrogen fuel cell vehicles. By the end of 2020, 2450 hydrogen fuel cell vehicles had been connected, ranking first in the provincial administrative region, but all of them were purchased outside the province, with obvious disadvantages in the field of hydrogen fuel cell vehicles. As a major energy consumption province,

Guangdong's fossil energy is completely dependent on imports. The energy required for electric vehicle charging is still unable to meet the "double carbon" goal. The hydrogen energy industry will be an important breakthrough to improve the energy structure.

Guangdong's new energy vehicle industry products lack international competitiveness, and even lack competitive advantages in Hong Kong and Macao, which belong to the Greater Bay Area. From January to July 2022, Tesla Motors sold 4125 vehicles in Hong Kong, accounting for more than 80% of the sales volume of pure electric vehicles in Hong Kong in the same period. It is the highest selling passenger car brand in Hong Kong.

3.3. Insufficient power supply under the target of "double carbon"

At present, new energy vehicles mainly use electric energy as the power source, and a few of them use clean energy such as solar energy. Compared with the gasoline, diesel and natural gas used by traditional vehicles, new energy vehicles do not consume any fossil energy and produce any harmful exhaust gas in the use process. They can completely achieve zero carbon dioxide emissions, which is an important way to achieve the goal of carbon neutrality. However, new energy vehicles, especially pure electric vehicles, need sufficient power supply to achieve the corresponding functions. In contrast, the power supply structure of Guangdong is relatively stable. From the perspective of energy structure, the proportion of coal power in Guangdong is about 45%, the proportion of power transmission from the west to the east is about 30%, and the proportion of gas and electricity is about 20%, followed by nuclear power, wind and other new energy. Coal and natural gas power generation accounts for about 65% in total, and traditional fossil energy power generation is still the main power source in Guangdong (Liu qian [13], 2021). Guangdong's power supply is excessively dependent on fossil energy, and it is precisely lack of such energy. For users, mileage anxiety and charging anxiety are one of the important factors affecting the purchase and use of new energy vehicles. In August 2022, new energy vehicles in Sichuan will face problems such as difficulty in charging due to the temporary shortage of power supply, which has flooded the front pages of various media. Guangdong also experienced power rationing in 2021. The problem of power supply will become a bottleneck in the development of Guangdong's new energy industry in the future.

4. Guided by new energy vehicles, build an innovative ecological Guangdong paradigm

4.1. Do a good job in top-level design and formulate medium and long-term industrial planning

Guangdong should follow the national development strategy in the new energy automobile industry, actively play its own advantages, aim at the domestic first-class and international leading development goals, do a good job in top-level design, and formulate medium and long-term industrial planning as soon as possible. We should follow the law of the development of emerging industries, handle the relationship between the government and the market, accelerate the transformation of government functions, and focus on setting strategic guidelines, creating a good policy environment, and improving service quality. Give full play to the guiding role of industrial policies, give full play to the incentive effect of fiscal policies, adhere to multi sectoral cooperation, properly handle the coordination problems in the process of industrial development, promote the integrated allocation of projects, bases, talents and funds, innovate the management mechanism of horizontal coordination and vertical integration, and all departments work together to promote the formulation of macro strategies and top-level design at multiple levels of industry, science and technology, finance and taxation, infrastructure, transportation, energy, etc. Solve major problems and bottlenecks in the development process through inter-ministerial joint meetings and other systems, coordinate relevant departments, formulate departmental plans and supporting policies and measures according to the division of functions, pay attention to the goal of coordination with related departments, urge grass-roots governments to actively implement, and form a strong support at the specific implementation level.

4.2. Make up for weaknesses and improve industrial structure

To develop the new energy automobile industry in Guangdong, it is necessary to face the major strategic needs, implement the policy of "unveiling the list and taking the lead", comprehensively promote the innovation and upgrading of upstream and downstream industries, and promote the reconstruction of industrial ecology

through the transformation of the new energy automobile industry chain and supply chain into a network system covering automobile, transportation, energy, communication, Internet and travel.

In terms of energy, we will vigorously promote structural adjustment, strengthen the construction of clean energy and power infrastructure, continue to increase the construction of nuclear, solar, wind, tidal and other clean energy power stations, and strive to constantly improve the energy structure of Guangdong Province while developing the new energy automobile industry.

It is necessary to strengthen the construction of the technological innovation system of the hydrogen energy industry. Guided by the National Medium and Long term Plan for the Development of the Hydrogen Energy Industry (2021–2035), we should actively play the key role of hydrogen energy in hydrogen fuel cell vehicles and electricity peak shaving, encourage and support relevant enterprises to carry out research and development of hydrogen fuel cell vehicles, wind and solar power + hydrogen energy storage technology innovation, hydrogen power generation and construction of hydrogen energy storage power stations, and form a hydrogen electric vehicle industry chain.

4.3. Science and technology lead innovation

Actively implement the strategic deployment of the national "three vertical and three horizontal" technology system to support the scientific and technological innovation of new energy vehicles, and further increase support for the scientific and technological innovation of new energy vehicles along the development direction of electrification, intelligence and networking.

Actively cultivate and introduce high-tech talents, support provincial colleges and universities to strengthen the construction of relevant disciplines in the field of new energy vehicles and key parts, establish a stable and long-term talent training mechanism, attract outstanding scientific and technological talents at home and abroad through policies, and establish a sound human resources guarantee mechanism to retain talents.

Integrate the scientific research advantages of the Greater Bay Area of Guangdong, Hong Kong and Macao, increase support for basic research, promote the transformation and application of basic research achievements in the technical research field of the new energy automobile industry, reduce the marginal cost of enterprise research and development, and increase the enthusiasm of enterprise research and development investment. Give full play to the government's guiding and coordinating role in the R&D process of the new energy vehicle industry, and promote the transformation of research achievements of universities and research institutes into the production field.

The government will make overall plans to support enterprises to tackle key common technologies such as batteries, chips, the Internet of Things, and control systems through integration of production and education, international exchanges, etc., and actively build scientific and technological innovation platforms such as new energy vehicle technology innovation centers to provide support for the research and development of common key technologies in the industry, and establish an independent and controllable intelligent supply chain system.

4.4. Give full play to the financial advantages of Guangdong Hong Kong Macao Greater Bay Area and build a new energy vehicle supply chain financial system

Guangdong should give full play to the regional advantages of Hong Kong Shenzhen financial center. On the one hand, it should take multiple measures to introduce foreign capital and tap its own financial potential to expand the financing channels and scale of the new energy automobile industry. On the other hand, it should guide and encourage angel funds, venture capital, incubation funds, etc. to extend to the early stage of technology research and development, and improve the efficiency and income of scientific and technological innovation resource allocation.

We should start with the establishment of a new energy vehicle financial security system, guide banks and non-bank financial institutions to provide financing security for each stage of the new energy vehicle supply chain through the construction of the supply chain financial system, and improve the overall efficiency of the entire new energy vehicle industry.

4.5. Cultivate a leading enterprise of world-class new energy vehicles

Encourage and support ecological leading enterprises to become bigger and stronger. In key areas such as vehicle manufacturing, power batteries, core chips, operating systems, and charging facilities, support leading backbone enterprises to gather high-end production and innovation elements, take the lead in building a sound industrial ecology covering applications, standards, testing, safety, services, etc., form an industrial cluster network led by core enterprises, and gradually build a leading enterprise with global competitive advantages.

Focusing on the supporting industry of new energy vehicles, we will cultivate a number of specialized, special and new "unicorn" enterprises with strong innovation ability and excellent quality and efficiency, vigorously promote the improvement of core basic parts and components, basic software, advanced basic processes, key basic materials, and industrial technology fields, and form a number of specialized, special and new enterprises with "unique skills".

Innovate the market environment, actively play the guiding role of policies and finance, create a strong atmosphere of technological innovation competition, force new energy automobile enterprises to obtain and consolidate their market competitive advantage by continuous innovation, accelerate the technological progress of the whole industry, and lay a material and technological foundation for the sustainable and leading development of the new energy industry.

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Wrote the literature review and checked the article, M.S.; collected data, processed empirical data, presented empirical results, wrote the main part of the paper and proposed research conclusions, H.C. All of the authors read and agreed to the published the final manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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Evaluation of the Effect of Regional Integration on Economic Growth—— Empirical Study on Beijing Tianjin Hebei Economic Circle Based on Synthetic Control Method

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Abstract: Under the dual background of the new normal of China's economic growth slowdown and the high attention paid to the coordinated development of regional economy, whether the regional integrated development policy can promote the common growth of regional economy is worth in-depth discussion. This paper collects the panel data of 27 provinces (autonomous regions) and 19 sub provincial cities in China from 2010 to 2018, and uses the synthetic control method to conduct an empirical study on the economic effect of Beijing Tianjin Hebei integrated coordinated development plan. The results show that: the impact effect of Beijing Tianjin Hebei integration coordinated development planning has obvious heterogeneity: It has a positive effect on the economic growth of Beijing; It has a negative effect on the economic growth of Hebei Province. The economic growth of Tianjin is positive in the short term and negative in the long term. The research conclusion of this paper can provide reference for compiling regional integration development plans and promoting coordinated development of regional economy.

Keywords: regional integration; Beijing Tianjin Hebei Economic Circle; economic growth; synthetic control method

1. Introduction

Regional integration is conducive to breaking administrative barriers and promoting the reallocation and integration of resource elements. However, in the process of regional integration, the failure of government competition and coordination mechanism often leads to problems such as urban positioning error, improper industrial division, repeated construction, inefficient operation, etc. Regional development planning is an important means to solve the above problems and effectively promote regional economic development. Efficient development planning can promote regional policy interaction, resource sharing, industrial layout rationalization, market integration, and achieve coordinated and balanced development of regional economy.

At present, many scholars have studied whether the regional integration development policy can promote regional economic growth through empirical methods, but no consensus has been reached. Liu Ruiming et al. (2015), based on the research method of PSM-DID, found that the western development policy has a significant negative effect on regional economic growth [1]; Li Guoping (2019) conducted an empirical study on the western region using the synthetic control method, and found that the economic zone planning has promoted the eco-

conomic growth of the western region as a whole [2]. Scholars represented by Liu Naiquan believe that the regional integration expansion policy has promoted the economic growth of the Yangtze River Delta [3]; However, Wu Jun and others have reached the opposite conclusion [4].

The two cities and one province in Beijing Tianjin Hebei region are geographically connected, economically integrated, and have the basic conditions for coordinated development. To this end, the Central Committee of the Communist Party of China and the State Council issued the Outline of the Beijing Tianjin Hebei Coordinated Development Plan in April 2015, which requires to promote the optimization of regional economic structure, promote the economic development of underdeveloped areas in Hebei Province, narrow the gap between the economic development level of Beijing and Tianjin, and become a new engine of national innovation driven economic growth. An Jingwen (2019) pointed out that the quality of economic growth in the Beijing Tianjin Hebei metropolitan area is generally on the rise, but there are some regional differences [5]. Then, under the dual background of the new normal of China's slowing economic growth and the highly concerned coordinated development of regional economy, does the Beijing Tianjin Hebei Coordinated Development Planning Outline, as a programmatic document, promote the coordinated development within the region to achieve common economic growth? Is there any heterogeneity in the impact on regional economy? These issues deserve further discussion.

For this reason, this study selected the Beijing Tianjin Hebei Economic Circle as the research object, took the Beijing Tianjin Hebei Coordinated Development Planning Outline released in April 2015 as a quasi natural experiment, collected panel data from 27 provinces (regions) and 19 cities above the sub provincial level in China from 2010 to 2018, and used the synthetic control method to build a model to conduct empirical research on the economic effects of policies. The marginal contribution of this study is as follows: (1) This study uses the synthetic control method to build a model for the first time to evaluate the policy effect of the development planning of the Beijing Tianjin Hebei economic circle, which can scientifically reflect the net effect of the policy impact on the Beijing Tianjin Hebei region. (2) In this study, 26 provinces (districts) across the country are taken as the control group of policy impact effects in Hebei Province, and 17 cities at or above the sub provincial level are taken as the control groups of policy impact effects in Beijing and Tianjin, reflecting regional differences, which can more accurately estimate the composite unit forecast value of unit economic growth in the experimental group.

2. Research Method and Variable Description

There are mainly two methods to estimate the net effect of policy in academia: synthetic control method and double difference method. Among them, the synthetic control method (Abadie and Gardeazabal, 2003) can avoid the problem of subjectively selecting control group samples and solve the endogenous problem to a certain extent. This method selects areas similar to the research object but not affected by the policy as the control group [6], selects specific evaluation variables and main factors affecting evaluation variables, constructs a prediction model, and gives different weights to control group units, Fit the counterfactual units similar to the research object before the policy implementation, and further compare the actual value of the evaluation variables of the research object after the policy implementation with the predicted value of the evaluation variables of the counterfactual unit to evaluate the policy effect [7]. The synthetic control method and variable selection are described below.

2.1. research method

If the economic growth value of $J+1$ regions in the $t \in [1, T]$ period is observed, the first region is the region (processing unit) impacted by the regional development planning policy at T_0 ($1 \leq T_0 \leq T$), and the other J regions are the regions not impacted by the policy (control unit). Define $Y_{j,t}^H$ as the actual value of economic growth in region j impacted by the policy, and $Y_{j,t}^I$ as the predicted value of economic growth in region j not impacted by the policy. The treatment effect of Beijing Tianjin Hebei development planning policy on the impacted region β_j , $t = Y_{j,t}^H - Y_{j,t}^I$. When $t \in [1, T_0]$, the synthetic control unit will fit the synthetic unit prediction value of region j according to the actual value of region j and its influencing factors $\beta_j, t=0$. When $t \in [T_0, T]$, if $\beta_j, t > 0$ indicates that the Beijing Tianjin Hebei development planning policy has a positive effect on the economic growth of the

processing unit; If $\beta_{j,t} < 0$ indicates that the Beijing Tianjin Hebei development planning policy has a negative effect on the economic growth of the processing unit; If $\beta_{j,t} = 0$, it means that the Beijing Tianjin Hebei development planning policy has no impact on the economic growth of the target region. The research objective of synthetic control engine is to estimate $\beta_{j,t}$, for the processing unit affected by the Beijing Tianjin Hebei development planning policy at time point T_0 , its actual economic growth value $Y_{j,t}^H$ can be directly observed, but its composite unit's economic growth prediction value $Y_{j,t}^I$ after time point T_0 cannot be observed. The synthetic control method can estimate the composite unit's economic growth prediction value $Y_{j,t}^I$ according to the model proposed by Abadie et al. (2010) [8].

$$Y_{j,t}^I = \alpha_t + \theta_j Z_j + \lambda_j \mu_j + \varepsilon_{jt} \tag{1}$$

In formula (1), α_t is the time fixed effect that affects regional economic growth; Z_j is $(r \times 1)$ Dimension vector, representing the observable control variable of city j that is not impacted by Beijing Tianjin Hebei development planning policy; μ_j is $(F \times 1)$ Dimension vector, representing unobservable regional fixed effects; ε_{jt} is the temporary impact that cannot be observed in each region, with the mean value of 0; coefficient θ is a $(1 \times r)$ Dimension vector, which is the estimated parameter of control variable Z_j ; coefficient λ is a $(1 \times F)$ dimension vector, which is the common factor of fixed effect μ_j in the unobservable area.

The synthetic control method weights the control unit groups to fit the characteristics of the predicted values of the processing units. Therefore, we need to get a $(J \times 1)$ The weight vector of dimension $W (w_2, \dots, w_{j+1})$ 'satisfies $w_2 + \dots + w_{j+1} = 1$, and $W_j \geq 0$. The vector W represents the composite control combination of the processing unit area under the impact of the Beijing Tianjin Hebei development planning policy; While w_j is used to measure the composite contribution rate of the control unit group area to the processing unit, the predictive variables of composite control are:

$$\sum_{j=2}^{J+1} w_j Y_{j,t}^I = \alpha_t + \theta_j \sum_{j=2}^{J+1} w_j Z_j + \lambda_j \sum_{j=2}^{J+1} w_j \mu_j + \sum_{j=2}^{J+1} w_j \varepsilon_{jt} \tag{2}$$

If there is a vector group $(w_2^* \dots w_{j+1}^*)'$, make the processing unit $j=1$ impacted by the Beijing Tianjin Hebei development planning policy meet the following requirements:

$$\sum_{j=2}^{J+1} w_j^* Y_{j,1} = Y_{1,1}, \quad \sum_{j=2}^{J+1} w_j^* Y_{j,2} = Y_{1,2}, \quad \dots, \quad \sum_{j=2}^{J+1} w_j^* Y_{j,T_0} = Y_{1,T_0}, \quad \sum_{j=2}^{J+1} w_j^* Z_j = Z \tag{3}$$

If $\sum_{s=1}^{T_0} \lambda_s' \lambda_s$ is nonsingular, then there are:

$$Y_{j,t}^I - \sum_{j=2}^{J+1} w_j^* Y_{j,1} = \sum_{j=2}^{J+1} w_j^* \sum_{s=1}^{T_0} \lambda_s (\sum_{j=1}^{J+1} \lambda_j' \lambda_j)^{-1} \lambda_s' (\varepsilon_{j,s} - \varepsilon_{1,s}) - \sum_{j=2}^{J+1} w_j^* (\varepsilon_{j,t} - \varepsilon_{1,t}) \tag{4}$$

Abadie's proof formula (4) shows that the mean value on the right side tends to 0, so $\sum_{j=2}^{J+1} w_j^* Y_{j,1}$ can be taken as an unbiased estimate of $Y_{j,t}^I$, and the estimated value of the impact of the economic growth of the processing unit impacted by the Beijing Tianjin Hebei development planning policy is:

$$\hat{\beta}_{1,t} = Y_{1,t} - \sum_{j=2}^{j+1} w_j^* Y_{j,1}, \quad t \in [T_0, T] \tag{5}$$

The key to obtaining the unbiased estimate of $\hat{\beta}_{1,t}$ is the existence of a vector group $(w_2^* \dots w_{j+1}^*)'$ that makes formula (3) hold. Abadie determines W^* by minimizing the distance $\|X_1 - X_0 W\|$ between X_1 and $X_0 W$, where X_1 is the eigenvector before the implementation of the Beijing Tianjin Hebei development planning policy, and X_0 is the $(K \times J)$ matrix. In general, the distance function is:

$$\|X_1 - X_0 W\|_V = \sqrt{(X_1 - X_0 W)' V (X_1 - X_0 W)} \tag{6}$$

In equation (6), V is a $(K \times K)$ symmetric positive semidefinite matrix. The optimal choice of V is to give reasonable weights to X_1 and X_0 variables, so as to ensure that before the implementation of the Beijing Tianjin Hebei development planning policy ($t \in [1, T_0]$), the weighted economic growth forecast value of the processing unit ($j=1$) matches the actual economic growth value of the unit in the corresponding year as much as possible.

2.2. Variable selection and data description

This study assesses the policy effect of the 2015 Beijing Tianjin Hebei Development Plan on economic growth, draws on the research results of Ye Xiuqun (2018) [9], takes GDP per capita as a variable to evaluate economic growth, and selects the following forecast variables that affect the evaluation variables: the level of fiscal expenditure (gov), measured by the proportion of government expenditure in total output; Capital investment (far), represented by the proportion of regional fixed asset investment in GDP; The industrialization level (sind) is measured by the proportion of the output value of the secondary industry in the total output; The development level of the tertiary industry (tind) is measured by the proportion of the output value of the tertiary industry in the total output; The degree of opening to the outside world (open) is measured by the proportion of total imports and exports in total output. If it is expressed in dollars, it is first converted according to the middle exchange rate of the year; Consumption level (com) is represented by the ratio of total retail sales of consumer goods to GDP. This study uses panel data from 27 provinces (autonomous regions) and 19 cities above sub provincial level in China from 2010 to 2018 to evaluate the effect of Beijing Tianjin Hebei development planning policies on promoting economic growth. The original data mainly comes from the China Statistical Yearbook and the Statistical Yearbooks of each province.

3. Empirical Analysis Results

The study evaluates the impact of Beijing Tianjin Hebei development planning policies on the economic growth of Beijing, Tianjin and Hebei in turn, and conducts a robustness test.

3.1. Evaluation of economic growth effect

The program package GDP per capita in stata15 is used as the evaluation variable of economic growth to estimate the synthetic control method. With Shanghai, Chongqing and 15 sub provincial cities as the control unit group, different weights are given to the control unit through the model and the composite Beijing and Tianjin are fitted; Using the same method, take 26 provinces (regions) outside Hebei Province as the control unit group to fit a composite Hebei Province, and the results are shown in Figure 1. The vertical dotted line represents the year 2015 when the Beijing Tianjin Hebei Development Plan was issued. The solid line represents the actual value path of real unit economic growth, and the dotted line represents the forecast path of synthetic unit economic growth. Figure 1a shows that before 2015, when the Beijing Tianjin Hebei Development Plan was issued, the actual economic growth path coincided with the composite Beijing growth path very high, indicating that the composite Beijing accurately fitted the actual economic growth value of Beijing before 2015. After 2015, the real value path of Beijing's economic growth has been on the path of synthesizing the predicted value of Beijing, which indicates that the policy has promoted the acceleration of Beijing's economic growth; Figure 1b shows that before 2015, the economic growth paths of actual and synthetic Tianjin had a high coincidence, indicating that synthetic Tianjin accurately fitted the actual economic growth values of Tianjin before 2015. After 2015, the difference between the two is: in 2016, the actual value of Tianjin's economic growth was higher than the synthetic forecast value of Tianjin's economic growth, after 2017, the actual value of Tianjin's economic growth began to decline, and by 2018, it was significantly lower than the synthetic forecast value of Tianjin's economic growth; Figure 1c shows that before 2015, the actual and synthetic economic growth paths of Hebei Province have a high degree of coincidence, indicating that synthetic Hebei Province can more accurately fit the actual economic growth value of Hebei Province before the implementation of the policy. The difference between the two after 2015 is that the actual and synthetic economic growth paths of Hebei Province in 2015-2016 are still highly coincident, and the trend of widening the difference only appears after 2017. By 2018, the actual economic growth value of Hebei Province is significantly lower than the synthetic economic growth forecast value of Hebei Province.

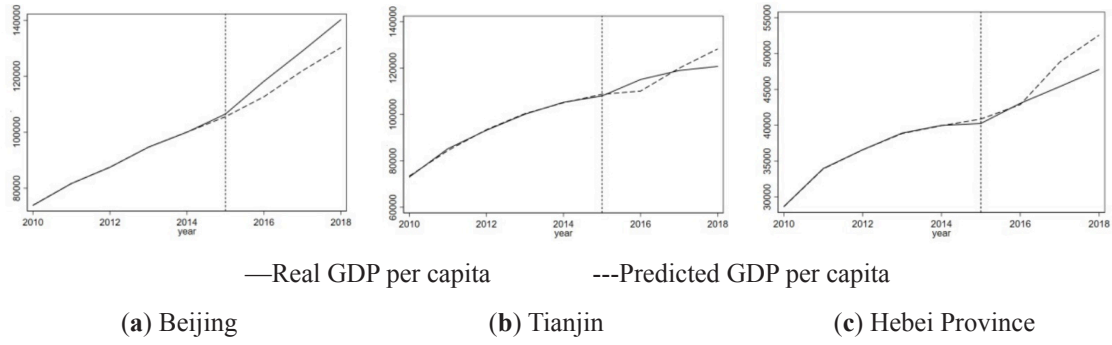


Figure 1. Policy Impact Effect of Beijing Tianjin Hebei Development Plan.

3.2. Robustness test

In order to ensure that the empirical analysis results are significant, this study uses the placebo test proposed by Abadie et al. The basic idea of this method is to assume that each control group unit is affected by the policy at the time point of policy implementation, and use the synthetic control method to test all units of the control group one by one. If the comparative test results show that the policy effect of the impacted processing unit is greater than the policy effect of the random unit, it indicates that the impact of the policy on the processing unit is significant.

Assuming that the control group of 17 cities in Beijing and Tianjin and the control group of 26 provinces in Hebei Province were impacted by policies consistent with the treatment group unit in 2015, the program package in STATA was used to conduct a placebo test, and the gap between the actual per capita GDP of each unit and the predicted per capita GDP of the corresponding synthesis unit was obtained. Referring to the practice of Abadie et al (2010) [8], the units whose RMSPE value is greater than 5 times of the synthetic RMSPE value in Tianjin are eliminated, and the predicted value of the synthetic unit is taken as the reference level (dotted line). The results are drawn with stata15 as shown in Figure 2.

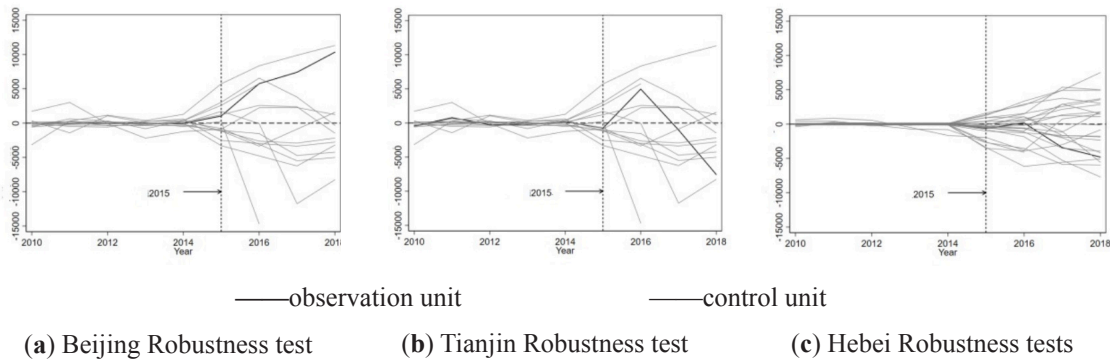


Figure 2. Robustness test of Impact Effect of Beijing Tianjin Hebei Development Plan.

Figure 2-a shows that the thick black solid line representing Beijing is basically above the thin solid line representing the control group unit, indicating that Beijing Tianjin Hebei has a significant positive impact on Beijing's economic growth; Figure 2-b shows that the thick black solid line representing Tianjin was above the thin solid line representing most control group units in 2016, but turned downward in 2017, but was below most of the thin solid lines in 2018, indicating that the policy had a significant positive impact effect on Tianjin in the early period, but had a significant negative impact effect in the later period; Figure 2-c shows that the thick black line representing Hebei Province in 2015–2016 was among the thin and solid lines representing most control group units. In 2017, the trend of economic growth began to decline, and in 2018, it was below the most thin and solid lines, indicating that the negative effects of policy shocks in Hebei Province in the later period were significant.

3.3. Further discussion

This study found that the impact of the Beijing Tianjin Hebei integration policy on the economic growth of Beijing, Tianjin and Hebei Province is significantly different, which has a positive impact on the most developed Beijing City, while a negative impact on Hebei Province, which has the lowest economic level. This conclusion is similar to the conclusion that Yang Rong et al. (2019) found that the difference in economic development levels among provinces (cities) in the Beijing Tianjin Hebei region is on the rise [10]. So why does the Beijing Tianjin Hebei integration policy have a negative impact on Hebei Province and Tianjin? Clarification of this issue can provide empirical support for regional integration to promote common economic growth. For this reason, the following will be analyzed in combination with existing literature.

The regional economic synergy of Beijing Tianjin Hebei is low, and the effect of promoting common economic growth through industrial division and collaboration is not obvious. Ma Xiao (2019) believed that the economic synergy effect of the whole Beijing Tianjin Hebei region was not obvious because of the weak economic synergy development ability of Tianjin and Hebei Province [11]. Shang Yongzhen and Chen Yao (2019) believed that Beijing, Tianjin and other cities in Hebei Province are at different stages of economic development. Beijing's service industry is developing rapidly, and most of its surrounding cities are still resource-based industries leading the development model; Due to the large difference in industrial gradient within the region, the first mover advantage of Beijing has absorbed more advantageous resources, thus further widening the regional economic development gap [12].

The main reasons why the economic growth of Tianjin after 2017 is not as expected are the unbalanced industrial structure, the reduction of fixed asset investment, the weak consumption growth and the insufficient financial support. The existing literature believes that the main reason for restraining the economic development of Tianjin is the unbalanced industrial structure [13–14]. Further from the consumption level, investment level and openness level, although the total import and export volume of Tianjin increased significantly in 2017 and 2018, its fixed asset investment decreased by 11.7% and 5.6% respectively in 2017 and 2018, and its total retail sales of social consumer goods increased by only 1.7% in 2017, but decreased by 3.4% in 2018. From the perspective of financial expenditure level, Tianjin's financial expenditure in 2017 and 2018 decreased by 11.3% and 5.5% respectively.

The main reasons for the negative impact of economic growth in Hebei Province are the unreasonable structure of human capital and the lagging effect of fixed asset investment. The agglomeration of Beijing Tianjin Hebei central cities has formed a negative spatial spillover effect on the surrounding cities, attracting the inflow of their human capital; The outflow of human capital from most cities in Hebei Province has hindered their economic growth [15]. Although the fiscal expenditure and fixed asset investment in Hebei Province have been steadily increasing year by year, due to the lagging effect of fixed asset investment in Hebei Province, its fixed asset investment has a short-term inhibitory effect on economic growth [16].

4. Conclusions and Suggestions

In order to further study whether the regional integration development policy has promoted the common economic growth and whether there is regional heterogeneity, this study takes the Beijing Tianjin Hebei Coordinated Development Planning Outline as a quasi natural experiment, collects panel data from 2010 to 2018, and uses the model constructed by the synthetic control method to evaluate the economic growth effects of Beijing, Tianjin and Hebei respectively. The empirical analysis shows that the regional integration development policy has obvious heterogeneity on regional economic growth, and the Beijing Tianjin Hebei development plan has a significant positive impact on Beijing's economic growth; It had a significant positive impact on the economic growth of Tianjin at first, but a significant negative impact later; It has a significant negative impact on the economic growth of Hebei Province.

Based on the research conclusions, the following suggestions are put forward: ① Improve the planning of industrial division and layout in Beijing Tianjin Hebei region. Formulate corresponding policies to encourage the transfer of labor-intensive industries to Hebei Province, and the transfer of high-tech industries with high dependence on foreign trade to Tianjin. ② Strengthen the talent and intellectual support for Hebei Province and

Tianjin. We will increase investment in and introduction of talent training in Hebei Province and Tianjin, give full play to the advantages of Beijing as the capital of talent gathering, provide more think tanks for Hebei Province and Tianjin, and promote industrial transformation and upgrading to high-end development. ③ Increase capital investment in Hebei Province and Tianjin. Avoid the siphon effect of Beijing on resources and factors, which leads to the lagging development of Hebei Province and Tianjin City; It is suggested to appropriately increase the financial transfer payment funds to Hebei Province and Tianjin City for infrastructure construction. ④ Accelerate the construction of Xiong'an New Area. In 2017, the central government proposed to build Xiong'an New Area in Baoding City, which is close to Beijing and Tianjin in Hebei Province, and issued the Outline of Hebei Xiong'an New Area Plan the following year, aiming to adjust and optimize the urban layout and spatial structure of Beijing, Tianjin and Hebei; It is suggested to accelerate the construction of the new area to accelerate the economic growth of Hebei Province and Tianjin.

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Author Contributions

Collected data, processed empirical data, presented empirical results, wrote the main part of the paper and proposed research conclusions, Y.Z.; presearch design, wrote the literature review and checked the article, W.D. All of the authors read and agreed to the published the final manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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A Review: The Safety Risk Perception of the Workplace

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Abstract: Security is still an important issue in the workplace, and many scholars' security models contain variables such as security risk and security risk perception. Different levels of awareness and perception of security risks will lead to different safety behaviors of employees. This paper combs the research of global scholars on employees' safety risk perception over the past half century, mainly summarizes the concept, antecedent variables and outcome variables of safety risk perception. Based on JD-R (work resource demand) theory and risk aversion theory, it straightens out the logical relationship between safety risk perception and safety behavior, and builds a basic platform for future research.

Keywords: safety risk; safety risk perception; work safety

Poor hazard identification ability and underestimation of safety risks will lead to disastrous safety accidents. However, previous studies have shown that a large number of potential safety hazards are still not recognized in the workplace [1–4]. Similarly, there is evidence that underestimation of security risks is a common problem in the workplace [5,6]. Therefore, in order to improve safety performance, it is essential to correctly understand the workplace factors that affect hazard identification and safety risk perception. When safety risks are underestimated, risk behaviors and safety operation behaviors deviating from the routine are becoming more common. In view of the poor ability of hazard identification and the underestimate of safety risks that may aggravate workplace injuries and accidents, it is very important to study and establish workplace factors that have a positive impact on the level of hazard identification and safety risk perception [4].

1. Connotation of safety risk perception

In the early days, people did not distinguish between risk and risk perception. Beck (1992, P55) believes that risk is a risk of knowledge, and there is no difference between risk perception and risk itself. Obviously [7], this view equates risk with people's reaction to it. This is the same as Rosa's (1998) definition of risk: according to cultural theory and constructivism, risk is risk perception. Similarly [8], Beck (1992, P21) defined risk as a traditional way to deal with the risks and insecurity brought by modernization itself [7]. Now we know that this statement is inaccurate, because risk is not only a product of modernization, it has existed long before the industrial society [9].

With the development of psychology, especially cognitive learning theory, scholars have realized the limitations of confusing risk and risk perception. Aven and Renn (2009) called for distinguishing between risk itself and how risk is perceived, because they are two completely different concepts [10]. Risk means the severity of uncertainty and risk consequences, and risk perception is an individual's awareness and perception of risk matters. Wang (2019) also agreed with this method of distinction. He believed that the risk in the workplace could be

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defined as the degree of personal exposure to hazardous environments [11]. researchers believed that perceived risk refers to an individual's perception of the uncertainty and possible negative consequences of specific events or behaviors [12], and the size of perceived risk depends on the probability of risk occurrence and the degree of potential loss. Aven and Renn (2009) believed that workplace safety risk perception refers to the risk of individual subjective judgment [10].

As for the meaning of security risk perception, in addition to various qualitative explanations, some people try to explain it in a quantitative way. For example, Cox (2008) believes that for a given scenario, security risk is usually calculated as a function of two variables: (a) the expected frequency of security events (such as injuries) and (b) the expected severity of security events, The formula can be expressed as follows: Safety Risk=Frequency of safety incidents X Severity of safety incidents [13]. Later researchers developed a new variable based on this formula, believing that risk perception includes (a) probability of risk occurrence, (b) severity of risk impact, and (c) expected utility of risk [10,12,13]. Based on the above research on risk, Xia et al. (2017) identified four ways of risk perception: (a) perceived probability, (b) perceived severity, (c) perceived negative utility, (d) direct risk perception; They have proved that the first three types of rational risk perception have an impact on direct emotional risk perception, and these four different forms of risk perception have affected the performance of employees' safety compliance and safety participation [5].

Most of the work carried out by researchers in the field of occupational health and safety focuses on the assessment of objective risks, and the workplace risk analysis methods used are basically quantitative. Xia et al. (2017) called this way of perceiving risk rational risk perception [5], that is, employees tend to perceive risk through three rational risk formulas (perceived probability, perceived severity, perceived negative utility). However, rational risk perception may have some problems [6]. For example, sociologists and psychologists have proved that only experts in specific fields can have the ability to deal with risks rationally. Outsiders often perceive risks based on emotions, that is, ordinary employees perceive and judge risks mainly through "feeling", a direct and direct way [14]. This risk perception may be irrational and vulnerable to many factors, such as risk characteristics [15], personal variables [16,17], and cultural and socio-economic background [18]. Although it is complex, emotional perception of risk can be assessed by asking individuals about their direct perception of risk; This is his or her direct and intuitive feelings about specific risks [19]. Decision makers' perceptual and intuitive judgments of risk (such as Slovic et al., 2016) will significantly affect the actual actions under risk conditions [14]. As far as possible dangerous behaviors of workers are concerned, personal risk awareness and subjective evaluation of occupational environment may also be important, which may affect objective risks and safety. Therefore, it is crucial to understand how employees perceive the risks or risk factors they face, especially those that are not obvious or visible. This is an important risk management that relies on individual insight. Deviations in risk perception may lead to misunderstanding of potential risk sources and ultimately have a negative impact on workers' safety [20]. To sum up, in terms of risk management, ordinary employees (not risk management experts) tend to perceive risks in a direct and emotional way, which will affect their safety performance.

In addition to the above interpretation of traditional risks, in recent years, scholars have begun to notice that the performance of emerging risks is different from traditional risks. Emerging risks have their own characteristics, such as strong uncertainty [21]. These types represent a new stage of risk growth. At present, there are few researches on emerging risks and their definitions are inconsistent. The focus of this paper is on the traditional risks commonly existing in all kinds of enterprises, but not on emerging risks.

2. Antecedents of security risk perception

Pandit et al. (2019) pointed out that security risk is an important near end factor in the comprehensive security model [4]. Exploring and verifying more and more factors that predict safety risks will help reduce safety accidents and incidents in production. The factors influencing risk perception in the existing literature mainly include: safety atmosphere, hazard identification ability, leader factors, etc., as well as multi factor analysis integrating their own characteristics, work tasks and environment.

Some studies have evaluated the impact of safety atmosphere on hazard identification and safety risk perception [22]. A study shows that the most vulnerable people are also those who have experienced the greatest

physical stress and feel the greatest risk associated with their work situation [21]. Flin and Mearns (1994) advanced this work to the British part of the North Sea (the northeastern marginal sea of the Atlantic Ocean) [23]. They identified three important aspects that may lead to accidents and close escape: (a) personal characteristics (including experience, knowledge, safety attitude, etc.); (b) Work characteristics (work task, environment, work pressure, etc.); (c) Platform characteristics (safety culture, social support, safety management system). The research of Flin and Mearns (1994) also shows that managers' commitment to safety, job satisfaction, attitude to safety, attitude to production and work environment have the greatest impact, which is closely related to workers' risk perception and satisfaction with safety measures, which is consistent with the joint survey results of Cox & Cheyne (2000) on many British industries, The above factors belong to the category of organizational security atmosphere [22,24–27]. Pandit et al. (2019) pointed out that safety atmosphere is an important predictor of hazard identification and safety risk perception, and both are the basis of injury prevention [4].

The research of Pandit et al. (2019) also found that employees who are willing to cultivate a positive safety atmosphere can benefit from higher risk identification ability and more sensitive safety risk perception. Employers who value the safety atmosphere can expect fewer human errors, unsafe performance and accidents in their workplaces. Secondly, their research also clarified the mechanism of the impact of security atmosphere on security risk perception. Specifically, a more positive security atmosphere can bring better risk identification ability, which can then be transformed into a higher level of security risk perception. Therefore, in addition to establishing a positive security atmosphere, efforts to improve the ability to identify hazards can also produce a higher level of security risk perception and related effectiveness [4].

In addition to security atmosphere and hazard identification, researchers also found the role of leaders in security risk perception [26]. Hofmann (2017) proposed that when employees have a good relationship with their supervisors and managers, they tend to commit themselves to safety and keep open communication on safety issues, and vice versa [27]. Zohar (2012) suggested that attention to employee safety is mainly expressed and implemented through the attitude and behavior of supervisors or leaders [28]. The consistent safety attitude, supervision behavior and reaction performance between supervisors and employees effectively promote the common recognition of safety priorities among employees. Wu (2005) defined safety leadership as the interaction process between leaders and followers. In the case of organizational and personal factors, leaders can achieve the organization's safety goals through their influence on members [29]. Some studies have shown that safety leadership can be an important factor in reducing employees' perceived risk level. Nielsen and Clel (2011) reported the negative correlation between real leadership and risk perception [30]. Oah et al. (2018) found that the important role of safety leadership in the field of occupational health and safety is increasingly recognized by people [3]. They pointed out that if supervisors implement active safety leadership, as an organizational or team factor, the risk level of workers may be reduced.

Generally speaking, many events are not caused by a single factor, but the result of a series of factors interacting at different levels of the system. Similarly, perception of injury or accident risk is also affected by multi-level factors, including individual characteristics, work tasks, work environment, leaders in charge, organizational atmosphere, government participation, culture, etc [27]. Man, Chan and Wong (2017) investigated more than 400 workers at construction sites in Hong Kong, and found that work pressure has a significant negative impact on safety risk perception [31]. The greater the work pressure, the lower the risk perception ability of workers. Mohamed et al. (2016) believed that workers' attitudes towards work safety could affect their risk perception level, in addition to safety management models, processes and rules [32]. Oah et al. (2018) tested a comprehensive antecedent model including safety atmosphere, safety leadership, workload and accident experience [3]. The results showed that workload and accident experience had a positive impact on cognitive risk perception, while safety leadership and safety atmosphere had a negative impact on cognitive risk perception and emotional risk perception. In the field of safety research, the transition from psychological interpretation to sociology and organizational framework will help us better understand risk perception and risk behavior. Rundmo (2010) pointed out that testing the risk perception model in the case of uncertain security atmosphere and working environment does not seem to be an appropriate strategy [33]. In the occupational environment,

employees' risk judgment must be related to the safety environment and other organizational and social factors, which are necessary for safe work. However, as pointed out by Oah et al. (2018), few studies have systematically examined many plausible multi-layer antecedents of perceived risk [3], such as a person's workload, accident experience, leadership in charge of safety and organizational safety atmosphere. To sum up, identifying the relative impacts and interrelationships of various factors affecting risk perception is helpful to determine which factors should be given priority when implementing security management policies.

Some studies have deeply discussed the specific effect process of safety risk perception on safety performance. Xia et al. JD-R theory was put forward in 2001 and is often used to explain work stress [34]. According to the work demand resource theory, all types of work characteristics can be divided into two categories: work demand and work resources. Job demand is defined as the physical, psychological, social or organizational aspects of work that requires sustained physical and/or psychological effort and is therefore related to certain physical and/or psychological costs. They are specific pressures associated with the work environment [35]. In a high-risk environment, examples of job demands include exposure to risks and hazards, physical demands, and complexity of work [36]. Work demands as work pressure will consume personal resources or energy to express the expected behavior of the organization, thereby reducing personal work performance (such as safety performance). Oah et al. This review of the study is in response to the suggestion of Oah et al. (2018) and is committed to analyzing the importance of security risk perception [3].

3. Result variables of security risk perception

Through the analysis of relevant literature on safety risk perception, it can be seen that the outcome variables of safety risk perception are mainly reflected in safety performance, risk taking behavior and protective behavior. There are many literatures on the impact of risk perception on safety performance in the field of safety. A meta analysis study by Christian et al. (2009) shows that risk perception is negatively related to unsafe performance [25]. Arezes and Miguel (2008) also believed that risk perception was crucial to promoting safety performance [20]. Pandit et al. (2019) found that the safety atmosphere can affect the safety performance of miners by affecting the level of hazard identification and safety risk perception [4], and found that employees who can perceive a higher level of safety risk may be more reluctant to take risk behaviors. This phenomenon can explain why some workers may choose to take dangerous behaviors, while others may be more inclined to avoid risks under similar circumstances, even if the relevant safety hazards have been identified. In view of these different findings and conclusions, it is necessary to further clarify the relationship between risk perception and safety performance.

Repeated exposure to various hazards in the work environment will lead to risk adaptation, which may lead to unsafe performance and violations through slow perception; In addition, the perception of the risk of an accident or injury can also lead to psychological stress (i.e. anxiety, pain or tension), reducing positive physical and mental resources. Specifically, frequent exposure to dangerous work environments will lead to physical fatigue, cognitive processing ability limitations and negative emotions, thus encouraging employees to complete work quickly [37]. In this process, the possibility of risky behavior increases the possibility of accidents and injuries [38].

A large number of observations and studies have confirmed the relationship between risk perception and protective behavior. In a study, 118 commercial pilots of China Southern Airlines were investigated, and it was found that risk perception and risk tolerance significantly affected their safety performance [39]. The study observed that risk perception directly affected the safety performance of pilots. Pilots with high risk perception are more likely to adopt safer behaviors than their peers with low risk perception. This study also found that the impact of safety risk on prevention behavior was regulated by risk perception: high risk perception reduced the negative impact of safety risk on safe operation behavior, while medium and low risk perception increased the negative impact. Gyekye (2006) found in a study of 320 Ghanaian workers that people who are often victims of accidents have quite negative views on workplace safety [16], safety matters and their supervisors [40]. Brewer et al (2007) shows that the perception of risk possibility, vulnerability and risk severity are variables that significantly predict safety performance [41].

According to the risk aversion theory, when there are gains (high risk perception), decision-makers are more concerned about asset losses (risk aversion) [42]. The relationship between risk aversion and risk perception shows that if a person thinks something is high-risk, he or she may take protective actions [39,40]. A laboratory study on 80 subjects showed that people who believed that the risk around them was very high would actively increase the behavior of wearing gloves to prevent hand injuries during painting, while subjects with low risk perception only chose to wear goggles according to the test requirements. Similarly, Kouabenan et al. (2015) [40] found that if front-line managers realized that their employees might face a high level of risk in the workplace, they would actively participate in safety management. It can be seen from the above that the level of risk perception affects people's behavior choices.

However, few studies focus on the impact of risk perception on safety compliance and safety participation, although these are two important and distinct employee safety performance [42]. In order to comprehensively test the impact of risk perception on safety performance, someone divides safety performance into two dimensions: safety compliance and safety participation. As a form of expression of specified safety performance, safety compliance is defined as a core activity that individuals need to carry out to maintain workplace safety [43]. Security participation refers to those behaviors that do not directly contribute to personal security, but help to form a security environment. In hazardous industries, front-line workers are directly exposed to workplace hazards and accidents. It can be speculated that if workers perceive high risks, they may take safety compliance measures to avoid or mitigate risks. Safety compliance aims to ensure that employees comply with the company's internal safety procedures and rules and regulations, including complying with standard work procedures, working in a safe manner, etc. Obviously, these actions can be a direct and effective way to prevent workers from falling into accidents or dying themselves. In addition to complying with safety regulations, safety participation is also an effective and proactive way to reduce risks due to the increasing complexity and uncertainty in the workplace [43]. Safety participation includes voluntary participation in safety activities, promotion of safety plans, helping colleagues solve safety related problems, participation in safety meetings and other activities [24,43]. To sum up, in the workplace, employees who perceive high risks may choose safety compliance and safety participation as effective preventive measures to reduce risks or hazards. Table 1 shows the research on safety risk perception outcome variables.

Table 1. Study on representativeness of safety risk outcome variables.

Researcher	Research design	Research results
Pandit et al. (2019)	Data was collected from convenient samples of 57 construction projects in the United States, and SAS 9.3 statistical software was used to test the proposed assumptions.	Safety atmosphere is an important predictor of hazard identification and safety risk perception, and both are the basis of injury prevention; Employees who can perceive a higher level of security risk may be more averse to taking risks.
Oah, Na, & Moon (2018)	The valid data provided by 376 employees from different manufacturing enterprises were analyzed. The hypothesis was tested by correlation analysis and hierarchical regression analysis, and the IBM SPSS software (version 23) was used for statistical analysis.	Workload and accident experience have a positive impact on cognitive risk perception, while safety leadership and safety atmosphere have a negative impact on cognitive risk perception and emotional risk perception.
Ji et al. (2011)	The data of 118 commercial pilots of China Southern Airlines were investigated.	It was found that risk perception and risk tolerance significantly affected the safety performance of employees, and risk perception directly affected the safety performance of pilots.
Gyekye (2006)	320 Ghanaian workers were investigated.	People who are often victims of accidents have quite negative views on workplace safety, safety matters and their supervisors, and have a high level of risk perception, thus improving protective behavior.
Huang et al. (2007)		Exposure to dangerous work environments can lead to physical fatigue, cognitive processing limitations and negative emotions, thus encouraging employees to complete their work quickly.
Kouabenan, Ngueutsa, & Mbaye (2015)	The participants were 63 first-line managers from two nuclear plants of French Nuclear Corporation, who were investigated through a questionnaire composed of several measurement scales related to different variables.	The higher the risk perception, the higher the participation in security management. Similarly, employees who think the safety atmosphere is good are more willing to participate in the safety management than employees who think their safety partners are not good.
Taylor & Snyder (2017) [44]	The data were collected from the end of 2012 to the beginning of 2013 for undergraduates majoring in psychology in a large university in southwest China. Laboratory research based on a study published by Probst (2002).	Performing tasks without safety procedures is more risky than performing tasks with safety procedures. Risk perception under the compliance framework will be positively related to compliance with security procedures.
Rubin et al. (2020) [45]	The data were collected from workers recruited from open-pit and underground mines in New South Wales and Queensland, Australia. A series of potential predictors of the risk frequency of Australian coal miners were tested using exploratory longitudinal research methods.	There is a negative vertical correlation between the age of workers and their risk-taking behavior in the mining industry, indicating that younger miners are more likely to take greater risks. Therefore, in the organizational safety performance model, the impact of age on employees is more important.
Brocal et al. (2021) [46]	The manifestations of new risks are determined through three cases: exoskeleton, nanomaterials and industrial automation.	The characteristic of determining emerging risks is strong uncertainty, causing serious physical and mental harm to workers. In this paper, the meta-learning strategy is proposed through qualitative methods.

Data source: collated from literature

4. Conclusion and future research

It can be seen from the above literature that the research and application of the concept of risk perception in the security field are very extensive [4,27]. We find that previous researchers have done a lot of research on the antecedents of risk perception in terms of individuals, work tasks and organizational climate. However, research on how employee organization relationship affects risk perception is still lacking, especially on the relationship between employee organization economic exchange relationship and risk perception. In addition, various studies on risk perception outcome variables in the existing literature have shown their impact on safety performance, but there is a lack of discussion on the impact of safety risk perception on safety performance in the two different

dimensions of safety participation and safety compliance.

It is suggested that future research should explore the impact on safety risk perception from the perspective of social exchange theory and work stress, and examine the impact process of safety risk perception on compliance and participation of safety performance, which not only responds to Pandit et al, It also responded to the suggestion of Xia et al. (2017) that the relationship between the two dimensions of safety risk and safety performance should be specifically examined [5]. In recent years, the focus of research on security risk perception has changed. Some scholars have shifted from individual perception to group perception [43], which will be an interesting change. In addition, the global prevalence of COVID-19 has forced enterprise management to make changes. Research on risk perception should take covid-19 as an important factor [47].

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The authors declare no conflict of interest.

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A Review of Organizational Identification Research

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Abstract: Organizational identification is a mature research field in the field of organizational behavior. Firstly, this paper systematically introduces the concept of organizational identification. In addition, the empirical research results of organizational identification are summarized, including the research on antecedents, outcome variables and intermediary variables of organizational identification. In the process of summary, the variables are divided into organizational level and individual level. Finally, the future research of organizational identification is prospected.

Keywords: organizational identification; leadership style

1. Concept of organizational identification

Organizational identification is a cross concept developed from the social identification of social psychology (social identification refers to the individual's recognition of the organization's membership, values and emotional maintenance, social identification) and cultural identification (cultural identification refers to the individual's sense of belonging and organizational commitment to the organizational culture and organizational values). It was first proposed and constructed by March of Stanford University and Simon of Carnegie Mellon University in 1958. However, in the 20 years since organizational identification was proposed, researchers have paid little attention to it. In the 1970s, some scholars even once regarded organizational identification as an integral part of attitudinal organizational commitment (AOC) [1]. Since then, some researchers have often confused the two concepts, greatly hindering the understanding of organizational identification. Until Ashforth and Mael (1989) explained organizational identification by summarizing the correlation between social psychology theory and organizational behavior research, and introduced social identification theory into the field of organizational behavior research to explain organizational identification, the concept of organizational identification began to receive renewed attention as an independent variable, and gradually became an important research topic in the field of organizational behavior and social psychology [2].

However, although the research on organizational identification has been more and more extensive in the theoretical circle since the 1980s, due to different research concepts and perspectives, scholars often summarize and define organizational identification from different research perspectives based on their own research problems. Some scholars emphasized the cognitive characteristics of organizational identification. For example, Ashforth and Mael, from a cognitive perspective in 1992 respectively, believed that organizational identification was a special form of social identification, and that individual employees defined themselves according to their membership in a specific organization. Some scholars also emphasized the understanding of organizational identification from the perspective of emotional characteristics. For example, O'Reilly and Chatman (1986) pointed out that organizational identification is a self-definition based on the expectation of individuals to the

organization and maintaining emotional satisfaction with the organization. In addition [3], Patchen defined the concept of organizational identification by integrating cognitive characteristics and emotional characteristics. Based on the theory of social identification, he proposed that organizational identification is composed of three mutually independent and closely related phenomena: "organizational cohesion, organizational support, and perception of shared characteristics with other organizational members" [4]. To sum up, so far, there has not been a broad consensus on the concept of organizational identification in the academic community. In order to better understand organizational identification, this study combed and summarized the definitions of organizational identification proposed by scholars in different periods, as shown in Table 1.

Table 1. Summary of Organizational Identification Definitions.

Scholar	Year	Definition
Brown [5]	1969	Organizational identification is the reaction of individuals to self-concept in the specific relationship between themselves and the organization. Organizational identification consists of the attraction of the organization, the consistency between the organization and individual goals, loyalty, and the relationship between individuals and organizational membership.
Lee [6]	1969 1971	Organizational identification contains the common characteristics of individuals' belonging, loyalty and existence to the organization, which vividly shows whether individuals identify with the organization and the degree of identification.
Patchen	1970	Organizational identification is composed of three mutually independent and closely related phenomena: organizational cohesion, organizational support and perception of shared characteristics with other organizational members.
Hall, Schnider, & Nygren [7]	1970	Organizational identification refers to the process and extent to which individuals gradually realize their individual goals and values and organically integrate with organizational goals and values, and this integration process and extent will lead to a strong emotional relationship between individuals and organizations.
Tajfel [8]	1978	The theoretical basis of organizational identification is social identification theory, which believes that the group to which an individual belongs is one of the important sources of self-concept. Applying the social identification theory to the organizational environment, organizational identification is an individual's recognition of his/her identification as a member of a specific organization, and this organizational membership enables individuals to have consistency in values and a sense of emotional belonging to their organizations.
Cheney [9]	1983	From the perspective of the dynamic process of the establishment of organizational identification, organizational identification is the process in which individuals connect and interact with the organizational context factors they belong to, and identify with the organization and a series of things related to the organization.
O'Reilly & Chatman	1986	Organizational identification is based on individuals' expectations of the organization, and maintains self-defined contact with the organization to achieve emotional satisfaction.
Ashforth & Mael	1989 1995	Organizational identification is a specific form of social identification, which is a psychological state in which individuals define themselves according to their membership in a specific organization.
Dutton, Dukerich, & Harquail [10]	1994	Organizational identification is a psychological process in which individuals integrate their feelings as members of a specific organization into their self-definition, that is, individuals define their own psychological process according to the common characteristics of themselves and their organizations.
Pratt [11]	1998	Organizational identification refers to the recognition of the consistency between individuals and the organizational values they join.
Riketta	2005	Summarizes the concept of organizational identification from three different perspectives: cognition, emotion and sociology, and believes that organizational identification refers to the relationship between self-concept and organization. That is to say, the perception and view of individual organization members on their own treatment in the organization affect their understanding of "who they are".
Wang [12]	2006	Organizational identification emphasizes the psychological feelings that individuals, as members of an organization, have on the organization after they are connected and interact with many factors in their organization.
Bao & Xu [13]	2006	First of all, from the perspective of static relationship, organizational identification is a reflection of the relationship between the self-concept of individual members and the organization; Secondly, from the perspective of dynamic process, organizational identification is a specific process in which organizational members obtain self-identification from the organization.
Wei et al., [14]	2007	Organizational identification is a process in which individuals choose, acquire and maintain the identification of organizational members in a specific organization, and obtain self-definition from the organization. Organizational identification has two main characteristics: persistence and multiplicity.
Xi [15]	2008	The degree of acceptance and internalization of the values, business philosophy, business style and characteristics of other members of the organization pursued by the organization based on the perception of self-identification in the organization.
Wan [16]	2013	Organizational identification is a state in which people define themselves as members of an organization, and it is characterized by dynamics and multiplicity.
Su & Lin [17]	2019	Organizational identification is a process in which individuals redefine themselves based on the work situation of their organizations. It is a special form of social identification.

Source: The author arranges by herself.

By reviewing and sorting out the definitions of organizational identification by the above scholars, we can have a more systematic understanding of organizational identification. Although these concepts are heterogeneous, we can find that these different definitions are trying to answer the following core questions: first, they clarify the subject of organizational identification, that is, they answer the question about "who identifies"; Second, it clarifies the object of organizational identification, that is, it answers "What do you identify with?" The problem of; The third is to answer the question of "degree of identification" between the members of the organization and the organization; The fourth is to clarify the formation mechanism of organizational identification. Most definitions of organizational identification imply that organizational members have linked their organizational membership with his or her self-concept [4]. In other words, the formation of organizational identification is a process and degree that individuals seek to be consistent with themselves through the comparison process of "who am I" and "who are we" in the organization.

The relationship between these concepts is shown in Figure 1.

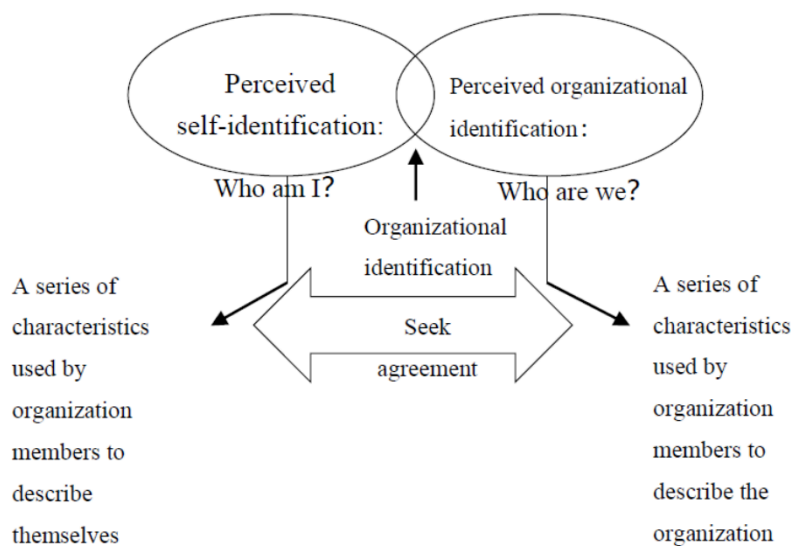


Figure 1. Formation process of organizational identification (Source: Xi (2008) [15]).

2. Research on organizational identification

At present, the research on the antecedents of organizational identification in the theoretical circle has achieved very rich research results. This study systematically combs the existing literature on organizational identification, and summarizes many factors that affect organizational identification into individual level factors and organizational level factors.

2.1. Antecedents of organizational identification at the individual level

In order to reveal the different effects of individual differences on organizational identification, scholars began to explore whether individual factors such as organizational members' personality traits, gender, length of service, education level, whether they have a job mentor, job satisfaction, and individual needs will have an impact on organizational identification as early as the 1980s and 1990s, and what is the mechanism of the impact [18]. As far as the existing literature is concerned, many studies have confirmed that the personality traits of organizational members can have an impact on organizational identification, among which the extraversion and agreeableness of the Big Five personality traits can positively predict organizational identification [19], on the contrary, Neuroticism dimension is negatively correlated with organizational identification [20]. Other studies have pointed out that employees' sentimental personality helps to enhance their recognition of their organization, that is, the higher their sentimentality, the stronger their organizational recognition [21]. In terms of gender, studies have pointed out that female employees generally have higher organizational identification than male employees [22]. There are three different voices about the influence of employees' working years on organizational identification. One view is that employees' working years are positively correlated with their organizational identification. Many studies at home and abroad have consistently shown that employees' sense of

identification with the organization will continue to increase with their working years in the organization [21,23]. At the same time, some scholars have pointed out that although the working years of organizational members have a positive impact on organizational identification, with the continuous passage of working hours, the growth rate of employees' organizational identification has a diminishing marginal utility [24].

The other view is just the opposite of the first one. It believes that employees' working years will reduce their sense of identification with the organization. This is because with the continuous growth of employees' working hours in the enterprise, employees gradually find significant differences between their own values and the organization in the process of interaction with the organization, which will affect employees' identification with the organization. The third view is that working years have no significant impact on organizational identification. In terms of education level, many scholars have confirmed through research that the education level of employees has a positive impact on organizational identification [25]. and some studies have particularly emphasized that education level is only related to organizational identification, but it does not mean that the higher the education level of employees, the stronger their sense of organizational identification will be [26]. Although the above studies have illustrated the different effects of individual characteristics of demographic information on organizational identification, it should be noted that these variables are often difficult for organizations to control in practice, so their enlightenment on practical management is quite limited. Therefore, it is necessary for many scholars to explore the impact of other individual differences on organizational identification. Some studies believe that whether employees have a mentor close to them in the organization has a profound impact on employees' cognition and feelings. The care, help and professional support brought by the mentor will increase employees' sense of identification with the organization [27]. In addition, scholars also found that the higher employee's job satisfaction, the higher his/her recognition of the organization [28]. In the research on the antecedents of organizational identification, other researchers believe that the degree to which employees' personal needs are met by the organization affects employees' internal identification with the organization [20]. But this does not mean that the more satisfied employees' needs are, the higher their organizational identification will be. For example, Zhang pointed out in his analysis of state-owned enterprises in the transition period that the satisfaction of employees' economic interest needs is an important factor to stimulate employees to identify with their organizations [22], but at the same time, there is a marginal diminishing effect of this influence. In other words, the more employees' needs for economic benefits, the better, but when this demand is met to a certain value, its role in employees' organizational identification will be weakened. Coincidentally, Yu et al. based on Maslow's hierarchy of demand theory, explored the impact of employee needs on organizational identification from four aspects: basic needs, emotional needs, independent needs and development needs [29]. The study found that for basic needs such as material welfare, when demand equals supply, its impact on organizational identification is optimal, because when employees' basic needs reach a certain absolute value, The additional investment and supply of the organization will not encourage employees to make more emotional investment in the organization, that is, the growth rate of this role is slowing down. The satisfaction of emotional needs and growth needs is positively correlated with organizational identification. Some researchers have pointed out through empirical research that the matching degree of employees' individual values and organizational values has a positive effect on motivating employees' sense of identification with the organization. This is because when employees' values and organizational values are more consistent, employees will think that they have a lot in common with the organization and are an indispensable part of the organization, and then identify with the organization [22]. In addition, some studies based on their own research have also found some factors affecting organizational identification at the individual level. For example, reade pointed out that when employees judge that they are more likely to succeed in the organization, they will have a strong sense of identification with the organization. A schooler pointed out that intellectuals are different from other ordinary employees. Therefore, in the face of knowledge workers, organizations can promote employees' positive evaluation of the organization and form organizational identification by improving their subjective well-being and positive emotional experience. Wu and Zhang examined the impact of psychological resilience, a positive work behavior, on organizational identification from the perspective of matching, and found that psychological resilience has a significant positive impact on organizational identification [30]. At the same time,

employees' performance of the psychological contract can shorten the psychological distance between employees and the organization, thus enhancing employees' sense of identification with the organization [31]. In addition, there are also studies from the perspective of psychological simulation, which have verified that the contact between employees' positive imagination and organizational leaders will increase the organizational identification of individual employees [32].

2.2. Organizational identification: antecedents at the organizational level

The exploration of the antecedents of organizational identification at the organizational level is a topic that scholars pay more attention to. They mainly study and confirm it from different perspectives, such as leadership style, leadership behavior, internal and external competition, organizational change, organizational reputation, organizational culture, communication level, management practice, and organizational support.

First, some researchers regard leadership style as a antecedent variable affecting organizational identification, and a large number of studies have confirmed service-oriented leadership style [19,29]. Transformational leadership style [26,12]. Moral leadership [14], inclusive leadership, democratic leadership style [19] and transactional leadership style [33], can positively affect organizational identification, while authoritarian leadership style negatively affects organizational identification [27]. At the same time, Lei et al. pointed out that modest and prudent leadership behavior can actively and positively promote employees' sense of identification with their organizations, while leaders' non contingency punishment behavior will lead to the depletion of employees' psychological resources, seriously affect subordinates' satisfaction with leaders and organizations, and thus weaken employees' sense of belonging and identification with the organization [34]. Huang et al. based on their empirical analysis of the four major commercial banks in China, found that in addition to positive reinforcement incentive behavior, negative reinforcement incentive behavior constructs a healthy, orderly and positive corporate culture by timely stopping and punishing employees' negative behaviors and bad thoughts, thus positively promoting employees' identification with the organization [35]. In addition, among the antecedents involved in organizational identification, organizational competition is a factor that researchers generally pay attention to. As early as the last century, some scholars pointed out that the fierce competition within the organization will lead to split behavior, leading to greater chances of friction and conflict between members of the organization. Employees are more inclined to safeguard the interests of individuals or small groups, and the cooperation and cohesion within the organization will decline, which will have a very negative impact on organizational identification [21]. Unlike internal competition, external competition can enhance employees' organizational identification by constantly strengthening their own values and understanding the boundaries of rules. This is because the above cognition is conducive to helping employees understand the difference between "us" and "them", strengthen their connection and emotion with the organization, and thus play a positive role in organizational identification [5,21]. Li broke the previous view of famous scholars Mael and Ashforth that internal competition will have a negative impact on organizational identification. By introducing the perception of organizational identification and organizational reputation [36], they discussed in detail the specific path and mechanism of internal and external competition affecting employees' organizational identification, Although the final results show that the path and mechanism of internal competition and external competition on employees are different, both internal competition and external competition are positively correlated with employees' organizational identification. At the same time, the research of Zhou et al. also supports the view of Li et al., that is, internal and external competition in the organization will produce factors conducive to employees' identification with the organization, and enhance employees' organizational identification [37]. In addition, researchers found that the speed and degree of employees' perception of organizational change is an important factor affecting their sense of identification with the organization through empirical research on Korean enterprises. At the same time, the study also clearly pointed out that employees' perception of the uncertainty brought about by organizational change can promote them to identify with the organization more [38]. In the same view as Kim et al., Chinese scholars Zhou believed that the higher the employees' awareness of organizational change, the stronger their recognition of the organization [39]. This is because when employees fully understand and master the objectives, procedures and other information of organizational change, they will face organizational change and understand the change

measures taken by the organization with a more positive attitude, this is conducive to enhancing their sense of identification with the organization. Some studies also found that the higher the organizational reputation perceived by organizational members, the easier it is for them to deepen their recognition of the organization, and thus improve organizational recognition [28]. Su et al. investigated 200 employees of two major companies in Taiwan region through online questionnaires, and confirmed that there was a significant positive correlation between perceived corporate social responsibility, external reputation perception, organizational trust and organizational identification [40]. Huang explored the three different types of organizational culture, including innovative culture, support culture and bureaucratic culture, will have different role in the identification of organizations, and find that innovative culture and supporting culture can be promoted to promote employee organization recognition, while bureaucratic culture may cause employees' negative emotions and evaluations of the organization [35]. Therefore, the study believes that bureaucratic culture has a negative impact on organization recognition, but it is not significant. Li studied the influence of various factors of organizational culture on organizational identification [41], and pointed out that the major influencing factors were benefit orientation and professional dedication orientation. Schuh et al. believed that organizational culture was significantly related to organizational identification [42]. Researchers also pointed out that a positive organizational culture atmosphere is conducive to enhancing employees' sense of identification with the organization. In addition, studies have pointed out that the collectivistic organizational cultural atmosphere will have a positive impact on employees' organizational identification [26]. Yildiz conducted path analysis on the relationship between teachers' organizational identification and organizational communication level, and found that when members of an organization get more abundant, complete and in-depth information from their own organization [43], they are more likely to communicate and communicate with the organization and its members, so that employees can have centripetal force and cohesion, and also more likely to stimulate employees' sense of belonging and identification to the organization. In addition, human resource practice will also affect organizational identification to some extent. Li analyzed whether the practice of high-performance human resources can have an impact on employee organization's identification and specific mechanism [41]. It shows that the contents of the internal flow and incentive salary of high-performance human resources have a positive impact on the occurrence of the organizational identification of the organization, and the contents of personnel screening and extensive training play a negative role on the identification of the organization. There is a significant positive correlation between the selection of the salary plan and the organization identification of the salary plan. Many scholars also began to pay attention to the impact of organizational support on organizational identification. Their research shows that the stronger the sense of organizational support, the higher the degree of organizational identification [22]. Wang et al. took the staff as the research object to test the performance evaluation system, organizational learning and organizational identification, and found that the performance evaluation system and organizational learning have a positive impact on the organization's identification. In addition, there are some domestic and foreign scholars from the intensity of work boundaries and advertising factors to discuss the organization's identification [12]. Related conclusions have continuously enriched and expanded the results of the organization's identification.

2.3. Organizational identification: outcome variables at the individual level

Based on the existing literature, organizational identification has a very far-reaching impact on the organization itself and individual organizational members. Therefore, when reviewing the research on the outcome variables of organizational identification, we can roughly summarize them into individual level and organizational level.

First of all, a large number of theoretical and empirical studies at home and abroad have shown that the results of the organizational identification at the individual level are mainly concentrated in the attitude and behavior of employees. These attitudes and behaviors are mainly reflected in the work satisfaction of individual employees and organizational citizen behavior, innovative behavior, work performance, and departure intention. Dick et al. According to the dimension composition of the organization identification, the organization identification is divided into four dimensions, namely the cognitive dimension, emotional dimension, evaluation

dimension and behavioral dimension [44], and respectively the research results show that the evaluation dimension in personal career identification and team identification has a significant positive impact on employees' work satisfaction. In addition, based on the theory of social identification, Karanika et al. studied how to influence the work satisfaction of employees in organization identification, and found that when employees have a strong sense of organization, employees have high satisfaction with their work, and research pointed out that research pointed out. The impact of the organization's identification on work satisfaction is mainly transmitted through work [45], especially vitality and dedication. In other words, due to a strong sense of organization, employees will ignore negative factors such as poor management, economic recession, or lack of resources, because the organization recognizes and cultivates employees in any case. "The feeling, the more employees agree with the organization, the more satisfied they are [46]. In addition, a large number of studies also found that employees' organizational identification can promote employees to show more organizational citizenship behavior [39]. Demir used multivariate variance to test the differences between public and private school teachers in organizational identification and organizational citizenship behavior [47]. The results showed that whether public or private schools, their teachers' organizational identification has a positive impact on teachers' organizational citizenship behavior, and the organizational identification and organizational citizenship behavior of teachers in private schools are significantly higher than those in public schools. Among many studies on organizational identification, the relationship between organizational identification and employee innovation behavior has always been the focus of researchers' enthusiasm [47]. However, it should be noted that in many studies, the relationship between the two is not completely consistent, and there are disputes. While most researchers believe that organizational identification plays a positive role in promoting employee innovation behavior [48], a small number of researchers point out that organizational identification may not play a role in employee innovation behavior, or even play an inhibitory role [21]. Some other studies explained the relationship from a negative perspective. For example, Lu and Peng also verified the relationship between organizational identification and organizational citizenship behavior of employees in 2018 [49]. Based on social identification theory and social exchange theory, they deeply analyzed the impact of workplace violence, such as workplace exclusion, on various dimensions of organizational citizenship behavior. Among them, the relationship between organizational identification, workplace exclusion and organizational citizenship behavior plays a mediating role, that is, workplace exclusion will consume employees' identification with the organization, thereby reducing employees' organizational citizenship behavior. In addition, there are also some studies that focus on the impact of organizational identification on employees' job performance. For example, Jiang and Liu think that teachers who have a high degree of organizational identification will work harder to improve their personal teaching and research level, which is conducive to the effective improvement of their job performance for teachers [50]. The research conclusions of Yildiz et al. also support the view that organizational identification can positively predict employees' job performance [43]. In addition, the enhancement of organizational identification is also conducive to reducing employees' turnover intention [46]. It is worth noting that most of the studies at home and abroad are committed to finding and verifying the positive effects of organizational identification on individual employees, ignoring that organizational identification may have a "double-edged sword" effect, so there is no obvious negative impact on organizational identification. According to the very limited research available, we can see that organizational identification may lead to some negative attitudes and behaviors of employees, such as pro organizational non ethical behavior [17].

2.4 Organizational identification: organizational level outcome variables

While scholars study the individual level of the organization's identification result variables, some scholars have also conducted some research on the organization level. Among them, Chinese scholars Bao Gongmin and Xu Bixiang pointed out in a study in 2006 that strong organizational identification can start the self-concept of employee group levels, and then cause changes in employees' psychological and behavioral changes, and improve organizational performance [13]. In addition, some studies have pointed out that in addition to the attitudes and behaviors of individual employees, it is also beneficial to the members of the organization to produce a positive psychological feeling that is closely related to the fate of the organization. And then effectively improve

the team cohesion and organizational performance. Stinglhamber et al. clarified the difference between organizational identification and emotional commitments, and whether there is a causal relationship between the two, the conclusion that the employee can increase its emotional commitment to the organization through the employee's identification.

3. Summary

Based on the systematic review of the above literature on organizational identification, we can see that scholars have explained the mechanism and role of organizational identification from different perspectives. It is precisely with the continuous enrichment and deepening of the academic exploration of the antecedents and outcome variables of organizational identification that the relationship between organizational identification and other variables has become increasingly clear. These research results enable scholars to regard organizational identification as a "magic bullet" to improve employees' work attitude and organizational citizenship behavior [39]. At the same time, there are inevitably some limitations and deficiencies in the study of organizational identification, which may become the focus of future research.

First, although most definitions of organizational identification imply that organizational members have linked their organizational membership with his or her self-concept [22]. However, in the existing research, few people pay attention to the research on how employees' organizational identification is produced and what results will be achieved by focusing on employees' self-concept. This seems to be a contradiction.

Secondly, although the current evidence of the beneficial results of organizational identification is extensive and growing [32], there is relatively little attention and research on understanding the specific potential dynamics that link organizational identification with employee behavior [31]. Although we know that organizational identification is usually good for employee behavior, we know little about why, how, or what benefits it has. For example, previous studies did not extensively consider the specific types of positive work behaviors and their potential psychological mechanisms related to organizational identification. On the contrary, most previous studies tended to conceptualize the behavioral consequences and potential mechanisms of organizational identification in relatively general and vague terms, as if the resulting positive work behavior is a unified structure, while the potential mechanism is a simple and single process. This neglect of the potential mechanism of organizational identification, to some extent, leads us to underestimate the practical value and application scope of organizational identification, and also severely limits our understanding of the dynamic process of organizational identification.

Thirdly, although a large number of studies generally believe that employees' identification with the organization is a key process for leaders to influence their employees' behavior [42]. However, few people have noticed such a problem: how do leaders affect the specific path of employees' organizational identification through different aspects of employees' self-concept, and thus affect employees' interpersonal relationships and behaviors? These problems need us to seriously consider and further explore.

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An Analysis of the Employment Status and Countermeasures of the "Post 00s" College Students in the Post Epidemic Period

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Abstract: Due to the continuous impact of the COVID-19, the employment situation of college graduates is complex and grim. At the same time, according to the statistics of the Ministry of Education, the number of graduates in 2022 will reach 10.76 million, an increase of 1.67 million over last year, and the number of graduates will exceed 10 million for the first time. The continuous growth of the number of graduates has also led to increased employment competition and pressure. In the face of the impact of the epidemic and the increasing downward pressure on the economy, China has successively launched a policy combination of "reducing, easing, returning and supplementing". However, the keywords such as slow employment, lazy employment and avoiding employment are still popular words in the current employment situation of graduates, and their development trend is increasingly severe. In this paper, the "post-00s" college graduates in the epidemic period are the research objects. Through data analysis of their employment status and causes, we propose targeted countermeasures and suggestions, hoping to contribute to the promotion of college students' employment.

Keywords: post epidemic period; employment of college graduates; career planning; employment awareness

College graduates are valuable human resources. To solve the employment problem of college students is not only conducive to their own work development, career planning and social harmony and stability, but also conducive to promoting economic growth and the development and progress of national undertakings. And the Party Central Committee attaches great importance to the employment of college graduates, and has taken a series of policy measures. Therefore, it is of great significance to carry out research on the employment status of "post - 00s" college students in the post epidemic period, and explore the corresponding solutions and improvement measures.

1. The Influence of COVID-19 Epidemic on College Students' Employment

1.1. Decrease in recruitment of market jobs

Under the continuous impact of the COVID-19, many industries have suffered great fluctuations. With the government effectively coordinating the epidemic prevention and control and economic and social development, increasing the stability of the market economy and introducing a series of enterprise support policies, the domestic economy is developing well in stability. However, the domestic epidemic situation has spread in many places, which has also brought a lot of uncertainty to the economic recovery. The situation of the employment market is slowly "warming up" in a short period of time, and the reduction of employment opportunities has a greater

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impact. In addition, in order to reduce economic costs, enterprises will also pay more attention to post experience and comprehensive ability in the selection of candidates in the context of epidemic economy. Most college graduates have less social work experience and weak competitiveness. And in the face of the increasing number of college graduates, the decreasing employment rate of former graduates and the increasing number of laid-off workers, the employment pressure of graduates can be imagined.

1.2. Complicated recruitment approach

The COVID-19 prevention and control measures have been normalized to ensure the personal safety of individuals and others. Students should adapt to the inconvenience of management and control on employment while adapting to the school epidemic management. The way and process for students to enter and exit schools, cross provinces and cities, and apply for jobs are complicated, and it is inevitable to delay employment efficiency. Moreover, the recruitment time and place of enterprises and units will also change in real time due to the changes of the epidemic situation, which will bring many uncertainties and obstacles to the employment of graduates.

1.3. The anxiety of college graduates is more common

Before the COVID-19, "freedom" was one of the pronouns of college students. A few days ago, a college student's online self-report caused a heated debate. The student said that it was particularly sad because the epidemic happened in the university when he could freely spend his time and money. The super high ratings and comments related to the video can be seen from the high recognition of contemporary college students. Since the outbreak of COVID-19, the closure of cities, districts and schools has been normalized, and health codes, travel cards and nucleic acid testing have become necessary for travel. It is customary to postpone going back to school, home observation, online teaching, etc. Students' emotions have also become the focus of colleges and universities. In particular, in the intersection stage of epidemic control and employment, graduates will inevitably have anxiety and anxiety, which will affect their enthusiasm for finding jobs [1].

2. An Analysis of the Employment Situation and Reasons of the "Post 00s" College Students

2.1. Current situation

2.1.1. The postgraduate entrance examination and civil service examination became the mainstream

In recent years, the number of people taking the postgraduate entrance examination and civil service examination is increasing. According to statistics, the number of students taking the postgraduate entrance examination in 2022 has climbed from 3.77 million in 2021 to 4.57 million, while the number of applicants for the postgraduate entrance examination in 2020 is 3.41 million; In 2022, the number of people who have registered for the written examination of the national examination will exceed 2 million, reaching 2.123 million. In 2022, the number of graduates will be 10.76 million, accounting for about 40% of the graduates. The number of civil service examinees also accounted for about 20%.

On the one hand, with the increase of the average level of education in China, graduate education is becoming more and more popular. In order to improve professional ability, cultural level and employment competitiveness, more and more students are taking the postgraduate entrance examination; On the other hand, with the occurrence of COVID-19, the economic market has been subject to fluctuations. The stability of civil servants' work has become a more important point for graduates. However, the competition pressure of the postgraduate entrance examination and civil service examination is high, and the probability of success is not high. It will also lead to that most of the students have not successfully found a job after preparing for one year, nor have they been admitted to graduate school or civil service.

2.1.2. The phenomenon of "slow employment" is becoming increasingly prominent

There are many reasons for the phenomenon of "slow employment". The main reason is that the market demand is saturated, and students tend to choose fewer jobs. "Slow employment" can be divided into active and passive types. Active slow employment means that some college students do not want to enter the working state

immediately after graduation and do not plan to continue their studies. Instead, they choose to travel temporarily or make an entrepreneurial investigation, and slowly think about their own life direction. Most of these students' families have good economic conditions, so they don't have to worry about living expenses. Passive slow employment refers to that students are unable to apply for the expected unit due to their personal ability, and are unwilling to choose the position they can apply for at a low level, this is the current situation of graduates who are in an awkward position in the middle and forced to enter "slow employment" [2].

"Slow employment" is a double-edged sword. Although some students can adjust their status and clarify their future life direction and goals, it is a manifestation of responsibility for themselves. However, the effect on other students may be opposite, because the society is sustainable development, and slow employment tends to cause disconnection from the society, increasing a sense of fear of employment. In turn, it turns into lazy employment and employment avoidance. This is not conducive to students' personal development, but also to social harmony and stability and the healthy development of the economy.

2.1.3. Increase in flexible employment

At present, the employment direction of graduates is more diversified. With the rapid development of the sharing economy, platform economy and part-time economy, new types of flexible employment are increasing. Flexible employment refers to flexible and diverse employment modes such as self-employed, part-time and new forms of employment. College students have become a new force in flexible employment. The "post-00s" are a generation growing with the Internet. Internet thinking is more active and innovation ability is more prominent. Therefore, unlike the general flexible employment, the "post-00s" college students' association is more inclined to employment and entrepreneurship in the context of the Internet, big data, etc. For example, open online stores, short video bloggers, self-entrepreneurship, and all media operations. In addition, "internship" is also one of the main forms of flexible employment for college students.

The flexible employment of college students is accompanied by certain risks. First, the legal relationship is vague; Second, the risk of occupational injury cannot be guaranteed; Third, the stability of employment is poor. And how to better avoid risks requires more caution when signing the contract, and take the initiative to understand China's various safeguard measures for flexible employment. In recent years, China has clearly increased its support for flexible employment and improved the protection of the rights and interests of flexible employees. In the 2022 Government Work Report, it is also pointed out that social security subsidies will continue to be given to flexible employment personnel, and registered residence restrictions on participating in social insurance in the place of employment will be lifted.

2.2. Cause analysis

2.2.1. Related to the family's economic situation

There are many reasons for the employment situation of "post - 00s" college students, among which the "slow employment" phenomenon is closely related to the students' family economic situation and family concept. According to the relevant survey, more than half of the "waiting for employment" graduate families are middle-income families. With the continuous improvement of the average level of education in China, the educational level of the parents of "post-00s" college students has also improved significantly, and the family's economic situation is better. The good economic situation of the family has weakened the life pressure of students and the driving force of "work upon graduation", and more and more parents are open-minded towards their children, believing that children do not need to find jobs as soon as possible. There are also some parents who do not want their children to work in the society too early, and are worried that their children cannot adapt to the change from school to society. This kind of indulgence to students also increases the degree of "slow employment".

2.2.2. College students' career planning is not clear

In the process of employment, "post-00s" college students are prone to problems such as value deviation, weak employment awareness, poor ability to resist pressure and frustration, and career confusion. Such problems will lead to employment delay, and they are prone to fear of employment after successive setbacks. In order to

find a "way out", some students may choose to take the postgraduate entrance examination, civil service examination and flexible employment to ease their and their families' anxiety. Some students may also choose slow employment, lazy employment or even escape employment.

The reasons for the above situations are mainly due to the unclear career planning of the students themselves. Unclear career will increase career confusion, which also reflects the lack of self-consciousness of students. Many college students have just entered the society, and the transition from students to workers cannot be quickly adapted, which will also produce great psychological pressure. Therefore, it is necessary for college students to make career planning before employment.

3. Countermeasures and Breakthroughs

3.1. Strengthen the publicity of relevant national policies

Since the 18th National Congress of the Communist Party of China, the Party Central Committee with Xi Jinping as the core has attached great importance to employment work, clearly put employment at the head of "six stability" and "six guarantees", introduced relevant policies to help enterprises solve difficulties, expand the number of employment positions, and continue to establish and improve the corresponding guarantee measures for flexible employment. According to "The Report on the Implementation of China's Fiscal Policies in the First Half of 2022" released by the Ministry of Finance, the central government's employment subsidy fund in 2022 has increased to 59.758 billion yuan, which is used to solve the employment and entrepreneurship problems in various regions. In addition, all relevant national policies need to be publicized to create a good social atmosphere. Let students further understand and master the employment policy, which is not only conducive to promoting the smooth employment of students, but also conducive to national economic construction and social stability.

3.2. School level

a. Open employment information channels. Relevant departments and counselors of the school shall transmit all kinds of information in a timely manner. For graduates, we will hold regular employment lectures and promotion meetings to help students seeking jobs connect with applicants. We also need to find out the students' job demands and job recruitment requirements, so as to better provide students with more effective information.

b. Carefully organize and carry out campus job fairs. Enrollment is a very important opportunity for graduates. Because school recruitment is basically formal recruitment, and the recruitment units of school recruitment have higher reliability after screening at the school level. In addition, many posts, such as state-owned enterprises, public institutions or civil servants, are only for new graduates. Enterprises participating in school recruitment will also pay more attention to the plasticity and initiative of graduates. Compared with social recruitment, which pays more attention to work experience and ability, school recruitment has a greater chance of success.

c. We will improve the education system and strengthen employment guidance. Improve the employment guidance course and scientifically guide students to plan their career. In addition, all departments should help students improve their employment awareness in an all-round way. On the one hand, relevant symposiums, experience sharing meetings, and student exchanges were held to solve the problem of employment awareness. On the other hand, arrange government affairs practice, the Communist Youth League to promote the employment of college students and other practical activities to strengthen students' working ability, comprehensive ability and anti-pressure ability. In addition, communication and assistance should be carried out in student practice to help students relieve pressure and guide students to determine their development direction.

d. Pay attention to students' psychological health, and timely investigate and guide students' psychological pressure. Establish and improve relevant account manuals, build a four level linkage mechanism of school college class dormitory, and arrange a psychological counseling hotline and daily heart to heart talks with counselors. Organize psychological symposiums, thematic class meetings, exchange meetings, etc. to guide students to correctly treat employment pressure, and cultivate all-round development contemporary college students with high psychological quality.

3.3. Family guidance

The parents of college graduates should maintain a positive outlook on employment, help guide students to pursue their life ideals, realize their own values and move towards a better future [3]. Enhance college students' morale, backbone and confidence, as well as their self-improvement and perseverance. Improve the ideological realm, integrate the "ego" into the "big ego", and go to the place of serving the society and the people. Live up to the times and glorious youth, and become a qualified builder and reliable successor of the socialist cause.

3.4. Students

As a contemporary college graduate, we should learn to be down-to-earth, enhance our self-awareness, and treat our personal conditions and social needs correctly. Strive to learn professional knowledge, work conscientiously and pursue progress, strengthen self-training, improve their comprehensive ability, and improve their psychological quality and anti-strike ability. We should also aim high, be a dreamer in the new era, create a wonderful life in the struggle, and contribute youth and strength to the motherland and the people.

3.5. Help for key students

We will help key groups, especially students from low-income families, students from monitored families, disabled students from economically disadvantaged families, and graduates who have not been employed for a long time. Implement relevant policies to help students find jobs smoothly. When students are in school, looking for jobs, and entering the workplace, they should take relevant assistance one by one to help students improve their competitiveness, comprehensive ability, psychological quality, etc. Help students complete the transition from school to society, and help students realize their personal values.

4. Conclusion

Employment concerns thousands of households, so we should adhere to the strategy of giving priority to employment. In 2022, the total number of college graduates exceeded 10 million for the first time. At the same time, affected by the COVID-19 and the increasing downward pressure on the economy, employment is facing many difficulties. In the post epidemic period, how to stabilize the employment of graduates and break through the employment pressure is the key issue [4]. Through targeted investigation, this paper analyzes the difficulties in graduates' employment, and puts forward countermeasures and breakthroughs from the aspects of policy implementation and publicity, various work that universities should carry out, families and students themselves, to jointly escort the smooth employment of college students, promote the healthy development of economy, and promote social harmony and stability.

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Innovation and Practice of Employment Guidance Teaching Mode Guided by Improving Employment Ability

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Abstract: The number of college students is increasing every year, so the difficulty of employment is in front of all colleges and universities, so improving the employability of college students is a problem that needs to be solved. Based on the investigation of the current teaching situation of college students' employment guidance course and the analysis of the reasons for the current teaching situation of college students' employment guidance course, this paper puts forward some measures to innovate the teaching mode of college students' employment guidance course, aiming to help and guide the improvement of college students' employment ability.

Keywords: improve employment ability; employment guidance teaching mode; innovation and practice

Recently, China's colleges and universities have expanded their enrollment year by year. College graduates are increasing every year. The employment pressure of college students is gradually increasing every year. Therefore, many colleges and universities have adjusted the employment work mode and increased the strength of employment guidance to improve the employability of college students. Based on the investigation of the current teaching situation of college students' employment guidance course and the analysis of the reasons for the current teaching situation of college students' employment guidance course, this paper puts forward some measures to innovate the teaching mode of college students' employment guidance course, aiming to help and guide the improvement of college students' employment ability [1].

1. An Analysis of the Current Situation of College Students' Employment Guidance Course

1.1. The content system of employment guidance course and the achievement of teaching objectives are not high

The content system of the current employment guidance course cannot achieve the teaching objectives well. We found that students generally believe that the teaching content has some deviation from the knowledge they need to find a job through the survey of teachers. The survey shows that students should keep abreast of the times in terms of personal resume production and interview skills, analyze each student's strengths and weaknesses in the learning process, and carry out personalized teaching targeted, comprehensively improve students' knowledge, ability and accomplishment, point out the direction for the continuous improvement of teaching content, make teaching reform more targeted, and better complete the training objectives of employment guidance.

1.2. The application of teaching methods is not targeted and diversified enough

The former Soviet educator Xiujiina said that teaching methods are the methods for teachers and students to work together to solve teaching tasks. Laska, an American educator, said that teaching methods are the process

of teachers sending out and students receiving learning stimuli. The employment guidance teaching method is not targeted and diversified enough in teaching, which restricts the actual effect of teaching. Therefore, in the employment guidance teaching, it is necessary to apply teaching methods in a targeted way, not only to grasp the common laws of teaching methods, but also to effectively grasp the characteristics of their own teaching of this course. On the basis of mastering the common laws of teaching methods, we should creatively develop and apply various teaching methods according to our own teaching practice [2].

1.3. Inadequate use of school enterprise resources integrated into employment guidance teaching in teaching

In teaching, teachers can generally effectively use the existing teaching resources in the school, but do not make full use of the enterprise resources. In fact, the school enterprise cooperation signed at the school or college level sometimes becomes a mere formality, without real implementation and utilization, resulting in a waste of resources, which is not conducive to students' practical teaching.

2. Analysis of the Current Teaching Situation of College Students' Employment Guidance Course

2.1. Inadequate class hours of employment guidance affect teaching content

The career guidance course has less class hours and requires more learning content. If the whole course content is taught within the specified class hours, the teaching content will be faster, and the students will digest the knowledge and skills taught by the teachers less, which will result in low achievement of the teaching objectives.

2.2. The application of teaching methods is not flexible enough and the teaching effect is not obvious

In the course of employment guidance, the teaching method is mainly used, including discussion method and questioning method. However, if other time-consuming teaching methods are used, such as simulated interview method, it will generally take a long time. This will affect the teaching of other teaching contents, and is not conducive to the content arrangement of practical teaching. Therefore, the application of teaching methods will be less targeted and diverse [3].

2.3. Focus on theoretical knowledge and neglect practical teaching

In the teaching of employment guidance courses, theoretical knowledge is emphasized, but practical teaching is less. Moreover, schools or colleges have actually signed school enterprise cooperation with enterprises and other units, and teachers have not made full use of resources, leading to one-sided or isolated teaching. We should integrate school enterprise resources into on-the-job guidance teaching, make full use of resources, and enrich the practical courses of employment guidance teaching [4].

3. Innovation and Practice of the Teaching Mode of College Students' Employment Guidance Course

3.1. Construct a reasonable teaching content system of employment guidance to meet the needs of students at this stage

The teaching content of college students' employment guidance is quite extensive, such as employment situation and policy analysis, career planning theory, employment information collection and identification, resume production, interview skills and etiquette training, job search psychological adjustment and rights protection, employment and entrepreneurship education, etc. These teaching contents are interrelated and form a complete system [5]. The goal of the college students' employment guidance course is to cultivate talents. In the long run, more attention should be paid to the overall development of students. The integrity principle of the system theory requires that the four years of college should be regarded as a whole. The employment guidance for college students should run through the whole process of college students [6]. At the same time, the hierarchy principle of the system theory requires that the employment guidance work should be carried out according to the different characteristics of students at different stages, with classified implementation, hierarchical guidance, individualized teaching suit the remedy to the case and adapt to the needs of students at this stage.

3.2. Continuously optimize the teaching team for employment guidance inside and outside the school, and gradually improve teachers' teaching ability

Our school can increase the employment of part-time teachers outside the school according to actual needs without changing the personnel and labor relations of talents [7]. Take measures such as setting up special post allowance for talents, introduce technical talents and management talents with rich practical experience in the industry and enterprises, take practical professional teaching tasks in schools, implement flexible introduction, achieve the goal of optimizing the team inside and outside the school, and constantly improve the teaching ability of teachers [8].

3.3. Plan the resources inside and outside the school, and constantly innovate the teaching mode and practice

Make rational use of the existing teaching resources in the school, and in addition to the school enterprise cooperation signed at the school or college level, set up a school enterprise related leading group, invite relevant professionals of the enterprise to participate in the student employment guidance competition as judges, cooperate to build, cultivate talents, start businesses and obtain employment, carry out relevant research, etc., realize resource sharing and complementary advantages, and form a school enterprise integration. It is a new mode of collaborative education of enterprise participation and student to enterprise practice.

4. Conclusion

The employment of college students is related to the peace and stability of the country and society. In recent years, the relevant departments of the country have paid attention to it and adopted a series of policies and measures to promote the employment of college students. As the first guidance course for students' employment, the course of college students' employment guidance takes improving employability as an important evaluation index of the course. Therefore, on the basis of investigation and analysis, taking into account the characteristics of college students and the job requirements of employers, we should increase the reform of the teaching of employment guidance courses, build a practical teaching model that is practical and effective in improving students' job seeking skills, and strive to cultivate comprehensive and applied talents suitable for the development of socialism with Chinese characteristics in the new era.

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Author Contributions

G.W. is responsible for writing the first draft and final draft of the thesis. S.Q. is responsible for theoretical guidance and gives constructive suggestions. All of the authors read and agreed to the published the final manuscript.

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Analysis on the Employment Situation and Countermeasures of Sino-foreign Cooperative College Graduates in Central and Western China - Based on the Analysis of the School Running Projects of C University

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Abstract: Under the background of the new era, how to serve the "the Belt and Road" strategy and how to train and deliver talents for Sino foreign cooperation in running schools in central and western universities has become a matter of social concern. In addition, under the influence of COVID-19, the employment space of graduates from Sino foreign cooperative education projects has been severely compressed, and the contradiction between talent supply and demand has intensified. Based on the data of the School of International Education of University C from 2015 to 2021, the analysis of employment status shows that the employment rate of graduates has fluctuated due to the impact of external environment in the past seven years. The analysis of the four aspects of employment region, employment type, employment market, and employment quality shows that the comprehensive quality of students needs to be improved, employment information service needs to be strengthened, employment assistance and guidance needs to be improved, and the participation of grass-roots employment projects is not high, It is expected to promote the employment of graduates of Sino foreign cooperation projects in colleges and universities in the central and western regions through the establishment of the employability enhancement project, the improvement of employment information service quality, the strengthening of employment assistance and guidance, and the vigorous publicity of grass-roots employment projects.

Keywords: colleges and universities in central and western China; sino-foreign cooperation in running schools; employment work

1. Introduction

In the context of the new era, how to serve the "the Belt and Road" strategy in the central and western regions and do a good job in the training and delivery of talents has become a matter of social concern. In particular, C University, which is located in the central and western regions, has established inter university cooperation with more than 50 universities abroad, Hong Kong, Macao and Taiwan, and has close relations with ASEAN countries. At present, it has been approved 4 Sino foreign cooperation projects, becoming the largest university in Guangxi that has been approved for Sino foreign cooperation projects. The projects are mainly

concentrated in the School of International Education. This paper takes the School of International Education of C University as the research object, and selects the employment data of graduates from the Sino foreign cooperation projects from 2015 to 2021 for analysis, with a view to promoting the employment of graduates from the Sino foreign cooperation in running schools in the central and western regions of China.

2. Overview of Sino foreign cooperation projects of the School of International Education

Since 2006, the School of International Education of University C has been carrying out Sino foreign cooperation in running schools. It has been adhering to the characteristics of internationalization of running schools, focusing on the quality of talent training, and adhering to the concept of cultivating professional talents serving the national and regional economic development. It strives to build four Sino foreign cooperation projects, namely, China Australia Accounting Undergraduate, China US International Business Undergraduate, China France Accounting Undergraduate, and China UK Accounting Undergraduate Five intercollegiate exchange programs, namely, the Sino French Accounting Undergraduate Program, the Sino Thai International Economics and Trade Undergraduate Program and the Sino Malaysian International Economics and Trade Undergraduate Program, and two innovative experimental classes, namely, the Sino Thai International Finance and Accounting Undergraduate Program and the ACCA International Accounting Experimental Program, adhere to the discipline characteristics and constantly improve the comprehensive quality of students.

3. Analysis on the Employment Status of Graduates from School of International Education

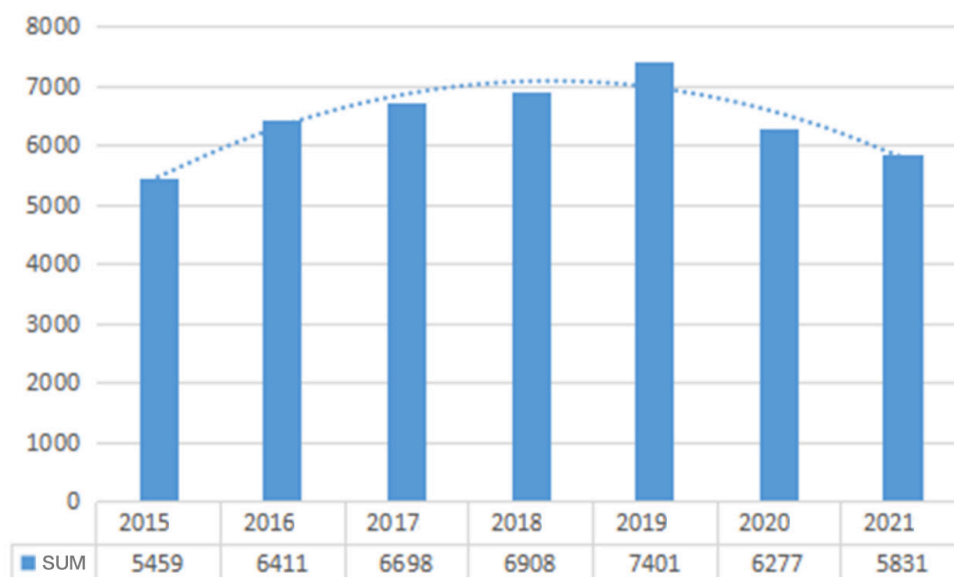


Figure 1. Statistics of the number of graduates of University C from 2015 to 2021.

The Report of the 19th National Congress of the Communist Party of China pointed out that employment is the greatest livelihood. We should improve the quality of employment and promote the employment and entrepreneurship of young groups such as college graduates. The colleges and universities in the central and western regions are facing the disadvantage of employment location, and the employment problem of their graduates is related to the development of the central and western regions of China. As a mid-western university, the number of graduates of University C is on the rise, from 5459 in 2015 to 5831 in 2021, as shown in Figure 1. In addition, the school employment rate fluctuates under the socio-economic impact. The data shows that the employment rate of 2017's graduates is the highest, reaching 96.75%. Affected by the epidemic, the employment rate of graduates will fall back in 2021. In the theory of career choice motivation, "the intensity of individual action motivation depends on the magnitude of valence and expectation". [1] The intensity of motivation is proportional to valence and expectation. The greater the valence, the higher the expectation, and the stronger the individual behavior motivation." [2] It can be seen from this that while colleges and universities in the central

and western regions continue to "produce" talents, high-quality employment guidance for graduates should become the focus of work.

According to American psychologist Veron, "There are different levels of employment needs and different levels of employment guidance." Under the concept of training professional talents to serve the national and regional economic development, the employment guidance work of Sino foreign cooperation projects has formed a set of working methods with international school running characteristics through continuous practice and exploration, laying a solid foundation for improving the quality of employment work.

3.1. Basic employment situation of graduates

3.1.1. The "output" of graduates continues to grow

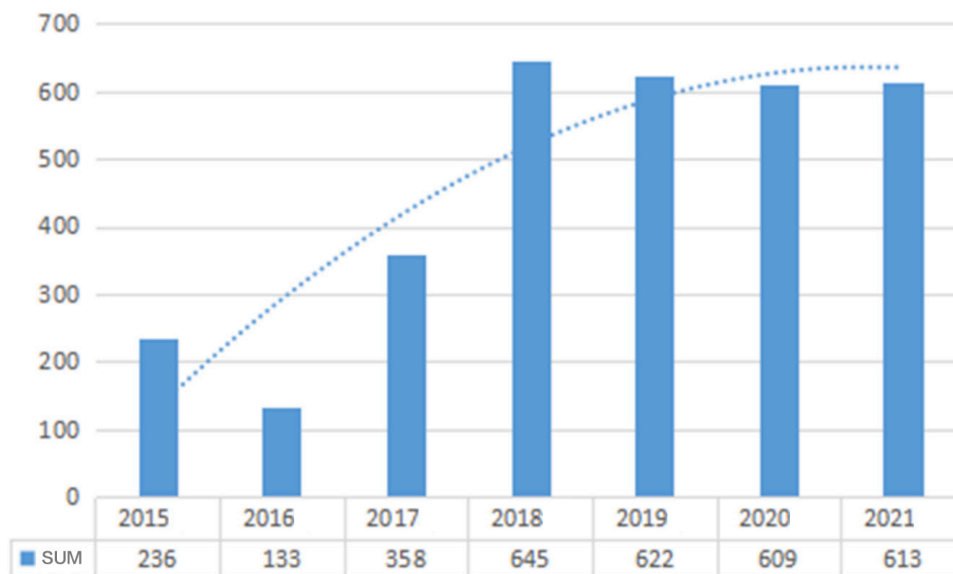


Figure 2. Statistics of the number of graduates of the School of International Education from 2015 to 2021.

The number of graduates of the School of International Education has been on the rise in the past seven years. Figure 2 shows that the number of graduates will increase from 236 in 2015 to 613 in 2021. Over the past seven years, the number of graduates has increased by 377, with an average annual growth rate of about 40%. Among them, in 2017, the college set up 6 majors instead of 3 majors, with the largest increase in the number of graduates, 225 more than the previous year, a growth rate of 169%. This shows that with the development of the talent training model, the specialty setting of the School of International Education is constantly expanding, and the talent supply capacity is constantly enhanced. Under the increasingly fierce market competition, the employment guidance for graduates should keep pace with the times and meet the requirements of the new era.

3.1.2. The employment rate of graduates fluctuates

In 2016, the employment rate of the graduates of the school of international education was 100%, and the employment rate was basically the same from 2017 to 2019. In particular, in 2020, due to the impact of COVID-19, the social economy was stagnant, and the employment rate fluctuated. The employment rate was 70.76%, which recovered to 77.7% in 2021. This shows that under the circumstances of the continuous growth of the number of graduates and the reduction of the demand of employers, broadening employment channels, cultivating the employment market, actively strengthening the exchange and contact of foreign universities in Sino foreign cooperation projects, and opening up the employment market for off campus practice have become the key and difficult points of employment services.

3.2. Analysis of graduates' employment

3.2.1. The employment area is centralized

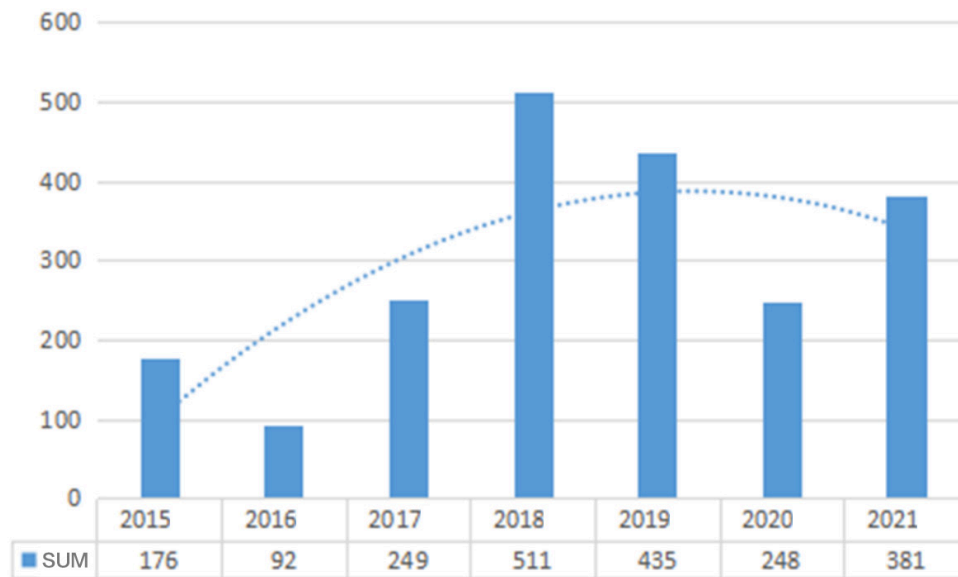


Figure 3. Statistics of the number of employees in the School of International Education from 2015 to 2021.

As shown in Figure 3, according to the statistical data analysis for nearly seven years, the employment of graduates of the School of International Education is concentrated in Guangxi, accounting for 65.05% of the total employment of graduates, indicating that the current talent training of the School mainly serves the economic and social development of Guangxi. According to the employment situation in the district, Nanning and Liuzhou have the largest number of graduates. In recent three years, the number of graduates in Nanning has reached 55.86%, and that in Liuzhou City has reached 5.7%, showing a trend of continuous growth. This shows that the regions with rapid economic development in the region have great attraction for graduates. As Veron believes, "the intensity of individual career choice motivation is affected by the intensity of individual career needs, the nature of motivation and behavioral goals." [2] Therefore, it is of great significance to correctly guide graduates to understand individual professional needs and behavioral goals for talent cultivation in western ethnic regions.

3.2.2. Diversified types of employment

With the development of national and regional economy, the demand for specialized talents continues to expand, and the types of graduates' employment continue to diversify. In 2015, there were two types of employment for graduates of the School of International Education: private enterprises and higher education. Among them, 62.27% of the graduates worked in private enterprises and 25% of the graduates went to higher education. By 2020, the number of graduates entering private enterprises, financial institutions, state-owned enterprises, government agencies and institutions will increase. In addition, 80 people went to higher education, with a rate of 21.05%, an increase of 7% over 2019. Four were recruited into the army, two participated in grassroots employment, and many started their own businesses through the Internet. Judging from the distribution of employment types in the past seven years, the employment types of college graduates in the central and western ethnic regions are constantly diversified. On the one hand, the promotion of national policies has created opportunities for college graduates in the central and western regions, and on the other hand, the college's employment guidance has played a significant role in guiding them.

3.2.3. The employment market is expansive

The School of International Education has carefully cultivated the employment market. Through constant exploration and practice, it has achieved certain results, showing the trend of expanding the employment market, which is mainly reflected in two aspects: first, the expansion of the domestic employment market. Through in-

vestigation and research, the college's employment market has been expanding from inside to outside in the past seven years. Before 2017, the college mainly explored the employment market by visiting and investigating the employers in Guangxi. Since 2018, the college has further broadened the employment channels for students and contacted employers in Wuhan, Guangdong, Kunming and other places to increase graduates' employment competitiveness. Second, the overseas employment market is expanded. The college has visited Thailand, Malaysia, the United Kingdom, Australia and other countries to exchange ideas and constantly build a platform for graduates to study for master's degree. In the past seven years, 280 undergraduate students have successfully applied for overseas postgraduate education. ① (① Data source: Data compilation of the Graduate Employment Quality Report (2015-2021) of School of International Education of University C.)

4. Problems in the employment of graduates of Sino foreign cooperation projects in colleges and universities in the central and western regions

4.1. The comprehensive quality of students needs to be improved

The comprehensive quality of graduates refers to the basic ability and comprehensive quality that graduates can show to complete different roles and tasks under a certain educational environment. The comprehensive quality of graduates needs to be improved mainly in two aspects: first, the quality of practical ability needs to be improved. On the one hand, students have insufficient understanding of practice. Some students only regard participation in social practice as a teaching task, and their attitude is not correct enough. On the other hand, the preparation for social practice is insufficient. Some students do not have strong basic skills in social practice, and their knowledge reserves are not solid, so they are likely to be at a loss when encountering problems. Second, the innovation ability needs to be strengthened. Due to the influence of exam oriented education ideas, graduates lack the "soil" for their innovative ideas and abilities. As the main body of innovation, most of the student groups have the attitude of learning for the purpose of examination, and the innovation ability cannot be fully exerted.

4.2. Employment information services need to be strengthened

From the perspective of the functions of the employment information system, the employment information system is mainly used for the release and information management of graduates' employment information. Its functions are relatively simple, lacking the positive interaction between graduates and the employment department, and its guidance function is relatively weak. The employment information is mostly one-way flow. Some students said that graduates can understand the information of the unit and the school, but their real needs are difficult to meet. From the perspective of the objects of employment information service, the service objects are limited to graduates, ignoring the cultivation of students' employment awareness when they enter the university, and failing to provide students with all-round employment guidance in the whole process.

4.3. Employment assistance and guidance need to be improved

First, the employment guidance for ethnic minority graduates was not paid enough attention. As a place where ethnic minorities live together, Guangxi should give planned guidance to the employment of ethnic minority college students according to the national interests and social needs. At present, the employment departments of some colleges and universities have not included the employment analysis of minority students in the employment quality analysis report, which shows that they have not paid enough attention to the employment assistance of minority students. Second, the employment assistance for poor students lacks linkage. The employment assistance for poor students is a systematic project. To give full play to the effectiveness of assistance, we must play the role of multi participation and work management. Through talking with poor college students, most students think that the linkage between the help subjects is relatively poor, mainly focusing on knowledge education and teaching, without paying attention to the actual needs of the help objects.

4.4. Low participation in grassroots employment projects

From the statistical data, from 2015 to 2016, no one from the School of International Education signed up to participate in the grassroots employment project. In 2017, although "zero breakthrough" was achieved, only

one person was involved in grass-roots undertakings. In 2018 and 2019, 2 and 5 graduates participated in grass-roots employment projects, mainly in the "three supports and one support" grassroots employment projects. As of August 2021, 31 graduates of the School of International Education have obtained the qualification of candidates recommended by the university, and 4 graduates have gone to the grassroots to practice. On the whole, the employment rate of grassroots employment projects is not high. Although the School of International Education encourages students of Sino foreign cooperative education projects to go to grassroots and hard areas to hone their will and become talents, there is still much room for grassroots employment.

5. Countermeasures and Suggestions for Promoting the Employment of Sino foreign Cooperative Education Projects in Colleges and Universities in Central and Western China

"With the change of the labor market and the expansion of higher education, many students are facing more and more problems in the transition from higher education to employment. The unemployment rate of graduates in many countries is very high. As a result, employers, politicians and the media all require to help students improve their employability and provide support for their entry into the labor market." [2] There are four ways to promote the employment of graduates of Sino foreign cooperative education programs in colleges and universities in the central and western regions.

5.1. Establish the project of improving employability

Colleges and universities in the central and western ethnic regions should turn their regional disadvantages into training advantages. "In terms of talent training, we should take the actual economic and social development in the western ethnic regions as the starting point, and adjust the discipline layout and specialty settings, so that the college training project is more scientific, reasonable and targeted." [3] In the establishment of the project of improving employability, the first is to invite experts to participate in employment guidance. Colleges and universities can create employment brand activities, invite heads of professional enterprises and institutions, senior alumni and employment service professionals to enter the school, so that students can understand and master the current employment situation. Second, we will increase investment in employment. "A skillful woman cannot make bricks without straw". To cultivate students' comprehensive ability, we need to increase capital investment. The increased special funds for employment are mainly used for employment research, employment teachers, employment guidance and employment assistance. The third is to build special employment consultation points. It serves the special needs of student recruitment information, resume production, interview skills and legal aid. Fourth, build a diversified system of employment teachers. Adjust the structure of employment teachers to form a comprehensive structure of teachers with rich guidance experience in enterprises, undertakings, entering schools, grass-roots employment, joining the army and so on, so as to teach students in accordance with their aptitude and give targeted guidance to different employment groups.

5.2. Improve the quality of employment information service

Improving the quality of employment information service is the essence of graduates' employment and also the starting point. First, unblock employment information transmission channels. On the one hand, we should improve the development of the employment information system, establish and improve the functions of employment information release, students' employment difficulties, employment needs, students' career exploration, and make full use of the employment information management system to realize the two-way flow of networked employment information services between students and employers. On the other hand, build an online employment platform. Network platform is an effective means to shorten the employment information gap between colleges and universities in the central and Western Ethnic Regions and other regions. We should use QQ, wechat, Weibo, Tiktok and other frequently used network platforms to carry out employment information consulting services, timely answer the problems and difficulties encountered by graduates in the employment process, and realize the networking, informatization and modernization of employment guidance. Second, expand the employment information service objects. The target of employment service is not limited to graduates. It focuses on the cultivation of employment awareness and the provision of employment services when students enter the university, expands

the scope of services to all students, formulates an all-round and whole process employment training plan for students, and improves the employment guidance courses, so as to improve the quality of employment information services for students.

5.3. Strengthen employment assistance and guidance

Minority students have not received enough attention in employment. Poor students belong to vulnerable groups when seeking employment. Therefore, we should strengthen employment assistance and guidance. The first is to "formulate an accurate employment assistance plan for minority students and poor students, so that students can understand the current employment situation, find their own position, and guide them to establish a correct concept of career selection." [4] Secondly, it is necessary to establish the employment information database of minority students and poor students, establish the assistance files of minority students and poor students, classify and summarize them according to the nationality and the source of students, achieve one person, one volume, and provide one-to-one assistance teachers, understand the students' desire to find a job, identify the students' needs for job search, achieve dynamic records in the process of students' job search, and achieve accurate assistance. The third is to establish the employer information database. Summarize the nature, salary and other information of employers by category, build an accurate database of employers, and pay regular return visits to employers to lay the foundation for quickly providing students with jobs that meet their needs.

5.4. Vigorously publicize grass-roots employment projects

Under the influence of COVID-19, the employment space of college graduates has been severely compressed, facing the contradiction of increasing talent supply and shrinking job demand. However, with the implementation of the rural revitalization strategy and the development of the modernization of grass-roots governance, a number of new jobs have been created at the grass-roots level, expanding the current employment space. In the new situation where challenges and opportunities coexist, it is urgent to vigorously promote college graduates' employment at the grassroots level. First, we need to integrate publicity resources through multiple linkage. Relying on the official websites, official account, policy consultation desks, brochures, exhibition boards and other publicity channels of schools and educational institutions, we will widely publicize the policies and measures of grass-roots employment projects, spread the project spirit, and expand the influence of grass-roots employment projects. Second, we should pay attention to the leading role of advanced models. On the one hand, we will establish a mechanism to commend advanced models. A variety of evaluation activities are carried out among students who are employed at the grassroots level, and their spiritual outlook is displayed through online media and other platforms. On the other hand, track the growth process and on duty status of grass-roots personnel, regularly hold the outstanding and advanced typical deeds lectures at all levels and at all posts, and give play to the incentive role of advanced and typical people.

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Author Contributions

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Research on Financial Sharing Construction of J Enterprise Group

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Abstract: In recent years, with the epidemic raging, more and more enterprises are trying to help enterprises reduce costs and increase efficiency through the use of technology to achieve the purpose of helping enterprises to rescue. Especially under the background of China's economic development changing from "high growth" to "high quality", how to make full use of "Internet +", "Internet of things +", "big data" and other digital technologies to shape the digital construction of enterprise group finance has become a major topic for managers. As a sword of financial reform driven by digital technology, financial sharing service is widely concerned by managers and financial personnel. Based on the construction practice of the financial sharing center of Guangxi Communications Investment Group, this paper deeply dissects the internal structure, construction path and transformation effect of the construction of the financial sharing center, and looks forward to the future development direction of the financial sharing center of the enterprise group, with a view to providing reference for similar group companies to build financial sharing centers.

Keywords: digitization; financial sharing; group management

1. Introduction

With the development of economy, from "high growth" to "high quality". As the leader of regional and industrial development, large enterprise groups have a huge asset scale and business volume, and gradually become the market economy subject of cross industry and cross regional diversified development. In this process, the shortcomings of the traditional high and long organizational structure model in group enterprise management have become increasingly prominent. Many branches and subsidiaries bring many sets of financial institutions, resulting in a large number of mid-level personnel. With the expansion of business, the number of multi-level subsidiaries has increased, the management cost has gradually increased, the financial process is lengthy, and layer upon layer transmission leads to distorted information, which is not conducive to the decision-making management of the enterprise group headquarters. How to solve this series of problems has gradually become a topic for managers.

During the exploration of generations of managers and financial personnel, we found that as a relatively flat financial management model, the financial sharing center can effectively solve the problems highlighted by group enterprises. By separating the same, complex, standardized and procedural businesses in the group from each branch and subsidiary, they are managed in the financial shared service center. This new financial model was first proposed by Ford and first built by ZTE among Chinese enterprises in 2005. Since then, it has been sought after by China Telecom, Huawei, Baosteel and other large enterprises [1].

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2. Review of the construction of financial sharing service center

Robert once described shared services as a new management idea for the group company to gain a leading edge from the low level structure and decentralized management model in relevant research [2]. Kris et al. proposed that shared services enable enterprise groups to not only achieve remarkable results in reducing operating costs and improving operating efficiency, but also achieve business process and standardization, help the company gain a leading position in the industry, and continue to create value for the group company [3]; Daniel and Melchior (2009) clarified that shared services are a means to help enterprise groups simplify management processes and help strengthen the modern management of the group; Based on the existing research conclusions, Ulrich summarized the shared services refining as combining repetitive and large business activities into a new organizational department, so as to achieve an extremely standardized unified processing process [4]. It is not difficult to find that the connotation of shared services is a constantly deepening process, that is, from the initial management concept to the adjustment of some functions, to the organizational reconstruction. Shared service is to centralize the repetitive and large amount of work in the enterprise group, establish unified service standards and processes, and achieve cost savings and scale benefits across business units. The research of Schulman et al. shows that shared services can be seen as the goal of reducing operating costs and improving financial function services through the integration and concentration of cross business unit resources within the group company [5]. Denburg hand (2010) believed that the core idea of financial sharing service is to hire fewer financial personnel, meet the expanding scale and business volume needs of the enterprise group, gradually reduce operating costs, maximize the scale benefit of the enterprise, and thus promote the strategic development of enterprise clusters; The International Association for the Management of Financial Shared Services (2010) pointed out that financial shared services are a management model that relies on information technology, processes financial business, and provides specialized services for internal and external customers of enterprises based on marketization. Compared with the definition proposed by Schulman et al., the International Association for Financial Shared Service Management emphasizes the importance of improving service quality and information technology for internal and external customers of enterprises. It can be seen that different scholars have different views on the construction of the financial sharing center, but their views are different on the whole [6]. To sum up, the connotation of financial shared services has been derived and developed on the basis of the connotation of shared services, and the sharing concept has been applied to the financial field to serve the financial management of enterprise groups.

3. Challenges Faced by J Enterprise Group in Implementing Digital Finance

3.1. J Introduction to Enterprise Group

J Enterprise Group Co. Ltd. was established in July 2008. According to the deployment of the Party Committee and the government of Guangxi Zhuang Autonomous Region, J Enterprise Group Co. Ltd. and Guangxi Railway Investment Group Co. Ltd. implemented strategic restructuring in September 2018 to establish a new J Enterprise Group Co. Ltd., which is directly under the People's Government of Guangxi Zhuang Autonomous Region, an important investment and financing entity and state-owned asset management entity in our region, and shoulders the task of promoting the construction of highways and railways in Guangxi. The three orientations of the Party Committee and the government of the autonomous region for the new investment are "the main force of Guangxi's transportation construction, an important force of Guangxi's industrial development, and a model of Guangxi's integration of industry and finance".

On August 30, 2018, the party committee and government of the autonomous region held a conference on the construction of "digital Guangxi" in Nanning, pointing out that the whole region should be mobilized to implement the "big data" strategy, build "digital Guangxi", build a new digital highland and an important portal of the digital Silk Road for ASEAN's opening and cooperation, accelerate the cultivation of new momentum of the digital economy, and provide strong support for high-quality development, It has brought significant historical opportunities for the informatization development of J Enterprise Group.

The "13th Five Year" Development Plan of Transportation Informatization and the "13th Five Year" Development Plan of Highway and Waterway Transportation Informatization in Guangxi Zhuang Autonomous Region

of the Ministry of Transport have been issued successively, which put forward ideas and pointed out the direction for accelerating the construction of transportation informatization in Guangxi.

In recent years, the Group has more than 800 transportation informatization talents, including 220 in software and hardware research and development, 280 in Internet operation, 100 in intelligent equipment manufacturing, and more than 200 in system operation and maintenance, distributed in computing centers, technology companies, Zhitong companies, Jietong companies, machinery research institutes, and operating companies.

3.2. J Enterprise Group's Implementation of Digital Finance

3.2.1. Enterprise group information system is not perfect

Because there are still obstacles in the business connection between systems, enterprise groups cannot fully realize information sharing, which leads to the problem that different businesses do not achieve effective linkage, thus increasing enterprise risks. For example, the performance of contracts such as A/R and A/P in the contract system cannot be obtained from the financial system, which may cause economic losses and also increase the risk of legal disputes. The Group involves many business operations, complicated data related parties, and unclear data ownership, which also increase the risk of business connection between systems and data development and utilization. Taking J Enterprise Group as an example, it has 45 wholly-owned subsidiaries, 18 holding subsidiaries and 581 controlling enterprises (6 of which are listed in Table 1), mainly engaged in the operation and construction of major transportation infrastructure such as highways; Collection, maintenance and maintenance of traffic facilities; Investment, construction and management in logistics, real estate, transportation, finance, resource development, municipal facilities, energy, construction and other industries, as well as international economic and technological cooperation and other businesses have been committed to establishing and optimizing the Group's information system in recent years, but there are still problems with defective and imperfect information system settings.

Table 1. 6 Subsidiaries of J Enterprise Group.

Serial No	subsidiary	Operating business
1	Guangxi Sanqi Investment Co. Ltd	Investment and management in transportation, construction, municipal engineering, transportation, landscaping and commerce Purchase and sales agency of metal materials, building materials, decorative materials, machinery and equipment Real estate development and operation, greening project and traffic safety project construction
2	Guangxi Communications Industry Co. Ltd	Wholesale of finished oil (limited to dangerous chemicals), operation of dangerous chemicals, chemical products (excluding dangerous chemicals), and sales of lubricating oil Wholesale operation of coal Transportation science and technology development, centralized fast charging station, electric vehicle charging infrastructure operation, and solar power generation technology services Lease of communication pipeline, optical cable and mechanical equipment
3	Guangxi Wuzhou Transportation Co., Ltd	Investment and operation in transportation infrastructure such as roads, bridges, stations, ports and wharves Investment in logistics parks, trade, finance and mining Purchase and sales of construction equipment, construction machinery and equipment, hardware and electrical equipment, and general merchandise
4	Guangxi Real Estate Group Co., Ltd	Cooperate with the land reserve institutions of the autonomous region in land collection and storage, land development and consolidation, land financing, land management, participation in some major infrastructure construction and social project construction in the autonomous region, and other matters authorized by the people's government of the autonomous region
5	J Enterprise Group Trading Co., Ltd	Mainly carry out bulk material supply and bulk commodity trade for expressway, railway and other engineering projects Carry out logistics supply chain service business of bulk commodities such as steel and asphalt around core production enterprises and important market customers
6	Liuzhou Expressway Operation Co. Ltd	Traffic facilities installation, management, expressway toll collection, maintenance, rescue and consulting services; Removal of obstacles outside the expressway Sales of agricultural and livestock products (excluding prepackaged food) Catering enterprise management Rental of machinery, equipment and houses

3.2.2. Failure to link data with supply chain management

At this stage, after the establishment of shared services, enterprise groups have not connected the data generated with supply chain management. In fact, this is also an "information island", which fails to achieve "horizontal integration and vertical connectivity" [7]. Sharing is not only a sharing platform, but also a sharing of data. The traditional supply chain is mostly managed independently by each subsidiary. There is a lack of conversion from "chain" to "network" among the subsidiaries. After the establishment of financial sharing, it provides an opportunity for the Group to achieve this transformation. However, in fact, the enterprise group has not really connected sharing with the supply chain, which also makes it more and more difficult for the group to make global optimization decisions, especially with the increasing number of group businesses and subsidiaries.

3.2.3. The ability to integrate and extract information needs to be strengthened

The ultimate purpose of financial sharing services is to help the enterprise group achieve cost reduction and efficiency increase through systematic, procedural and standardized operations, and to link data with decision-making. The big data formed by sharing services can support the decision-making of the management and achieve the strategic objectives of the group. However, at this stage, China's financial sharing center has not really realized the transformation from data to decision-making [8]. At present, most financial sharing service centers in China still stay at the level of centralized accounting, and the root cause of this problem is the lack of information integration and information extraction ability of enterprise groups.

4. J Financial sharing construction of enterprise group

4.1. J Implementation path of enterprise group

Since 2021, J Enterprise Group has applied the middle office strategic thinking to the construction of the financial sharing center by means of "top-level design, overall deployment, step-by-step implementation and gradual improvement" and adhering to the concept of "high starting point construction and high-quality operation", It is committed to building the financial sharing center into the "control center, business center, data center, talent center and service center" of the group company.

4.1.1. J Organizational Structure of Enterprise Group Financial Sharing

Compared with the traditional long financial organizational structure, the financial organizational structure of the financial sharing service center is a flat structure, which is a secondary organization directly managed by the Group Finance Department. This organizational structure with few management levels and wide control range enables the group headquarters to make decisions on the corresponding financial information quickly, reduces the drawbacks caused by layer by layer reporting, and realizes the rapid transmission and communication of information.

The financial sharing service center of J enterprise group adopts an M-type organizational structure, that is, this structure is to integrate the business of each branch and subsidiary, and pass the corresponding business through the consulting service department, business audit department, general ledger statement department, tax management department, operation and maintenance department, fund management departmentThe General Affairs Department and other seven departments handled the problem (Figure 1). This organizational structure is also more conducive to setting posts and staffing according to business efficiency, and is easy to assess. Besides, each post conducts business processing according to standardized processes.

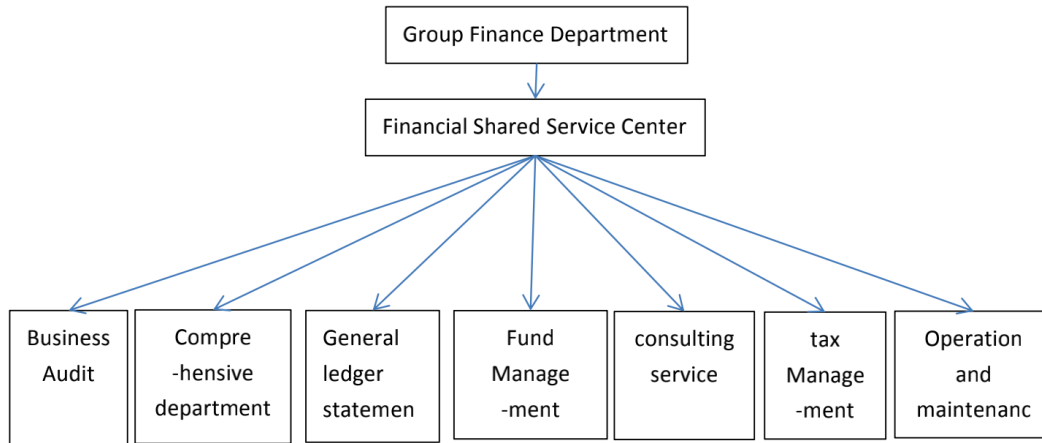


Figure 1. Organization Chart.

4.1.2. J Enterprise Group Financial Sharing Process Construction

The financial shared service center is not only the centralized accounting, but also the business process reengineering. According to the business characteristics of J Enterprise Group, its financial sharing service center adopts a platform architecture of "technology business data". It retains and continues to build the front-end system in the business module. The back-end ensures that the back-end system platform is consistent with the group headquarters, such as a unified accounting system, a unified capital system, a unified cost control system, a unified asset management system and other modules. The optimization of these business processes has achieved the goal of unifying accounting policies, accounting subjects, accounting processes, information systems and standards within the Group, and further improved the Group's efforts in reducing bill transfer, standardizing reimbursement processes, and reducing capital control risks.

4.1.3. J Enterprise Group Financial Sharing Information System

The financial sharing service relies on an efficient information system [9]. Since 2021, J Enterprise Group has started to establish a unified information system, which includes five systems, including image, reimbursement, accounting, archives, and fund management (Figure 2). By sharing the financial data and business data of each subsidiary on the platform, the information can be used efficiently.

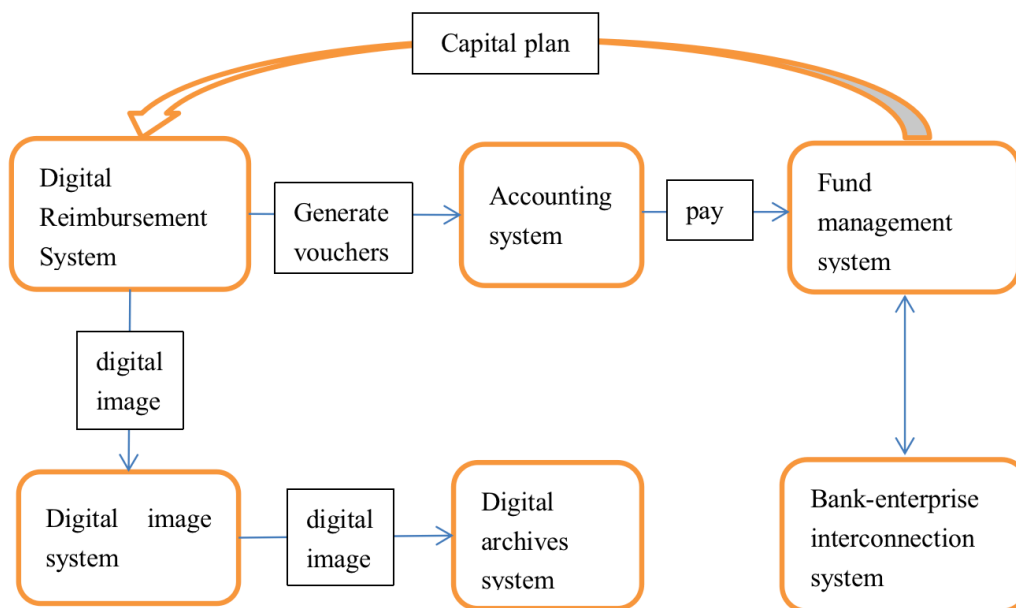


Figure 2. Financial Shared Service Information System Architecture.

First of all, the image system is responsible for the circulation of physical bills and the extraction of original vouchers, including four aspects of collection, transmission, business processing and storage. Secondly, the reimbursement system is the core system integrating document filling, approval, approval and voucher generation. It includes the complete system of business occurrence, information collection, application approval, information transmission, accounting processing, information import and information archiving (Figure 3). Furthermore, the accounting system is divided into four aspects: general ledger, A/R, A/P, and asset; The general ledger integrates the whole process of voucher entry, review, and reversal to financial statements; Accounts receivable integrates the whole process of credit management, invoice processing, A/R records, revenue confirmation, collection management, and loan management; Accounts payable integrates invoice management and payment management; Asset management integrates the whole series of projects under construction, increase, transfer, change, depreciation and retirement. In addition, the archive system mainly implements electronic management of vouchers, statements, archives and warehouses, and uses electronic information for reference management.

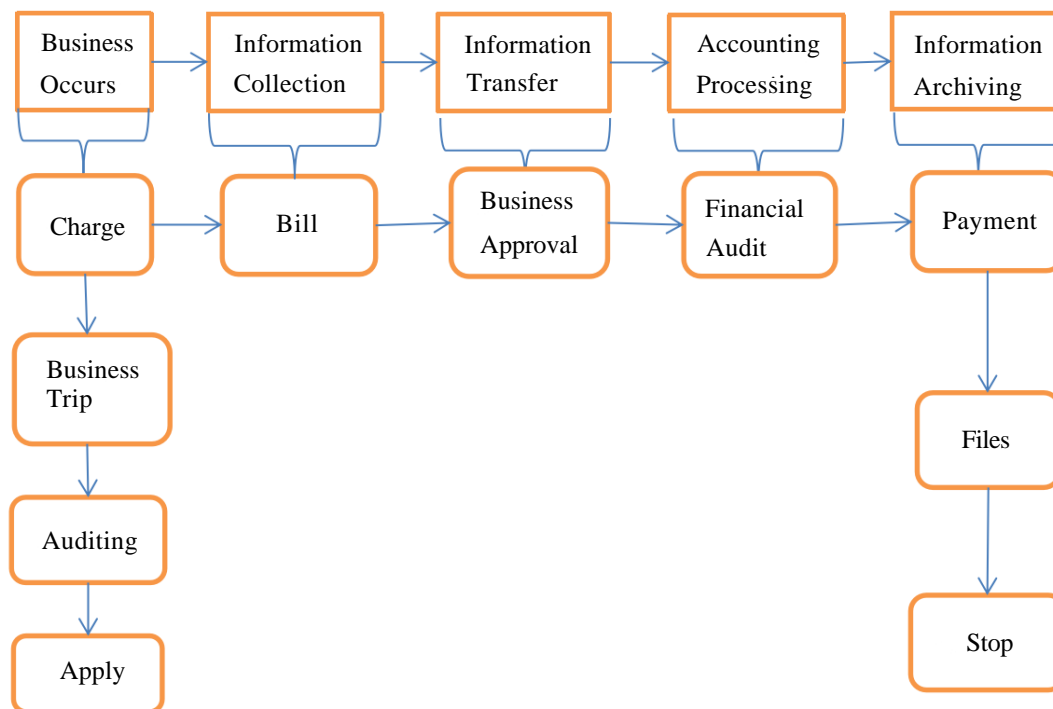


Figure 3. Reimbursement Business System.

4.2. Effect of digital financial sharing construction of J enterprise group

4.2.1. Reduce management cost and create enterprise value

Through the optimization and unification of processes and standards, the reasonable structure of organizations and posts, the construction of information platform, the standardization of post manuals and other management manuals, as well as fair and open employee performance competitions, the shared service center of J Enterprise Group has effectively mobilized the enthusiasm of employees, realized cost reduction and efficiency increase, and won efficiency and cost advantages for the Group [10]. At the same time, the shared service center of J enterprise group implements the unified entry mode for those businesses with high frequency and large total amount, which greatly avoids the accounting failure caused by accounting, and thus improves the accuracy of accounting data for the business performance feedback of the enterprise group.

4.2.2. Financial transformation, standardized accounting level

By building a financial sharing service center, J Enterprise Group has forced relevant employees within the Group to carry out transformation, so as to improve the overall level of practitioners, further improve the accounting level of the enterprise, and lay a more solid foundation for the business decision-making of the enterprise group. Not only that, the accounting related content generated in the whole supply chain link is gathered

in the financial shared service center, and the operation is carried out according to the standardized process and standardized operation, thus realizing the accounting information quality requirements of accuracy, timeliness and integrity. In addition, the internal staff of the financial sharing center can give an early warning of possible accounting errors in each link of the supply chain, and communicate with relevant personnel in a timely manner, thus realizing the financial supervision of the enterprise group headquarters on each subordinate organization or each supply chain link.

4.2.3. Unify caliber and improve efficiency

After J Enterprise Group established the financial sharing service center in 2021, the number of employees engaged in financial accounting within the whole group has decreased from 1700 to 600, and the number of relevant staff has decreased to about 65%, but the sharp decrease in the number of personnel has not affected the efficiency of the financial operation of the group in any way. In fact, after the implementation of financial sharing services, the efficiency of individual financial personnel has increased significantly. For example, for invoicing posts, the per capita invoicing rate has increased by nearly 43% compared with that before the implementation of shared services, and the closing date has decreased from 15 days to 7 days. This allows the Group to save a large number of professional accountants with financial work experience and familiar with the Group's environment, who can engage in financial management work such as budget, internal control, capital and business support.

From the perspective of the overall business performance of the enterprise group, as the group continues to promote the construction of digital finance, in the first half of 2022, J Enterprise Group also handed over a satisfactory answer, in which the development benefits of the business sector achieved a new breakthrough, achieving a year-on-year gross profit growth of 171%; The business structure of the logistics sector continued to optimize, and the operating income of the logistics park increased by 16.87% year on year; New achievements have been made in improving the quality and efficiency of the manganese industry development sector, and the output of self operated manganese ore increased by 9.87% year on year; In the financial sector, the operating efficiency of the combination of industry and finance rose steadily, and the total profit increased by 16.32% year on year; The science and technology information sector continued to promote transformation and upgrading, and the digital construction of science and technology companies achieved remarkable results. In the first half of the year, the revenue and profit increased by 123% and 150% respectively year on year. This series of data shows that the financial sharing services of J Enterprise Group have played a positive role in promoting the group's operation and management.

4.3. *J Development direction of financial sharing of enterprise group*

4.3.1. Service oriented, establish data governance system

J Enterprise Group, as a regional industry leader, wants to build a complete set of enterprise data centers, set up a series of basic support platforms such as enterprise level cloud computing platforms, big data analysis platforms, group backbone communication networks, and security management, control, and operation and maintenance platforms, coordinate the use of enterprise IT resources, and reduce the cost of information construction and operation and maintenance, Improve the efficiency of enterprise operation and management, and provide good support for business and technological innovation. Taking service-oriented application architecture (SOA) as the overall goal, while maintaining compatibility with a variety of mainstream technologies, business function reuse and business process optimization can be achieved through service sorting, opening and calling. Establish a data governance system, build an enterprise level master data model, manage data sources and data caliber, control data quality, and enable enterprise operation management data to be generated once and called everywhere.

4.3.2. Strengthen the fund operation management of the shared service center

In the future, J Enterprise Group will build a "fund cloud" platform based on the data middle office model, use new management methods, combine new technologies with fund operation management, and continuously enhance the fund management strength of the sharing service center and the "fund cloud" platform. At the same time, we will develop a payment based breakthrough and deploy the group's integrated account and payment

clearing and settlement system; This includes collection and payment, account management, financial services, clearing and settlement, risk control and other functions. It will further achieve the personalized goals of security, compliance and internal business integration. So as to improve the financial management and overall operation efficiency as a whole, and realize the information system of unified payment, unified control and unified accounting management in the whole scenario and process. In this way, the financial sharing of J Enterprise Group can achieve the goal of standardizing the fund business process, embedding standardized operations into the fund system, maximizing unmanned operation, and comprehensively improving the fund operation capability and efficiency of the financial sharing service center platform [11].

4.3.3. Optimize the financial sharing service mode of financial business middle office

With the continuous development of financial sharing services of J Enterprise Group, the experience and knowledge related to financial sharing will also continue to lay a solid foundation for the Group to shift from financial sharing services to business middle office. The Group will continue to further develop and optimize the financial sharing service platform based model in the future. Through the feedback of real-time information, we can integrate the high-quality resources of the enterprise to maximize the use of resources and generate income. At the same time, the Group will further shape an efficient and centralized cloud platform for fund management and financing management, better serve its subsidiaries in all regions and sectors, and provide strong support for the Group's strategic development.

5. Enlightenment from J Enterprise Group's Implementation of Financial Sharing

The financial sharing of J Enterprise Group is not only a centralized organizational structure, nor a simple information platform, nor is it a common pipeline based accounting. The sharing center is a platform that can meet the requirements of rapid information conversion; It is a platform to strengthen group control; It is a platform focusing on risk control; It is a comprehensive service platform for efficient utilization and optimal allocation of resources [12].

5.1. Focus on core competence and boost digital transformation

For J Enterprise Group, the implementation of financial sharing services is not only a system and platform, but also a few core capabilities that the Group wants to cultivate. First, end-to-end process management capability; This ability is the carrier of all work promotion, and the key to avoid duplication of approval, complexity of audit, different caliber, and access to high-quality data, because it breaks the traditional barrier that financial sharing only aims at internal processes, and avoids the problem that business and finance are not on the same topic. Second, the ability to summarize and refine rules; The summary and refinement of rules here mainly refers to the establishment of an approval rule base in the shared service center. The rule base is formulated in advance according to various financial systems, which can be quickly extracted from the rule base and used in the process of approval, so as to improve the approval efficiency and accuracy. Third, the ability of digital expression; This is based on a certain amount of data, and helps the group to operate, or even make strategic decisions, through the refined classification and analysis of data. This data expression ability can effectively avoid the drawbacks brought by the traditional report based analysis.

5.2. Embrace change and build a platform for continuous digital transformation

In today's environment of rapid technological progress and continuous innovation and change, both business and demand are changing. As a platform serving business and enterprise strategy, the financial sharing service center needs to keep pace with the times. What Computer Telephony Integration has built is a shared service center that constantly embraces changes and continues to promote digital construction. During the continuous development of the shared service platform, J Enterprise Group will build a high-level management platform with the characteristics of application scenarios, capacity services, data integration, technology components, resource sharing, etc.

5.2.1. Build and improve enterprise information system

The enterprise group should fully integrate the business scope and build a business management system. Based on the financial sharing center, build a digital middle platform architecture. The digital middle platform is a digital innovation platform built on the technical framework of big data cloud computing AI, which supports the standardization and rapid customization of enterprise digital business applications, and solves the problems of enterprise business resilience and responsiveness in the face of industrial interconnection and ecological development [13]. Taking J Enterprise Group as an example, in view of its multiple subsidiaries, wide business scope and incomplete coverage of digital transformation, businesses can be classified first. First, they are core businesses and general businesses respectively. The core businesses such as expressway and other major transportation infrastructure construction and business priority construction management system can ensure the effective implementation of core businesses. The second is to design a unified management system for the same type of business of each subsidiary, describe the business with the same "process" only according to the method of business process management, change the tedious business process into a simple process, and focus on tackling key problems one by one.

5.2.2. Establish a middle office supply chain management platform

Enterprise groups tend to develop in a diversified way, and their business scope often covers all walks of life. At this time, they need supply chain support to maximize the effectiveness of enterprise group resources. This requires middle office thinking to help managers govern enterprise groups. Among them, there is no lack of scholars' research. Zhong Hua (2020) believes that the core point of digital transformation of enterprises is how to optimize business processes through transformation, solve the pain points and difficulties in business, create profits, and realize business value. He also puts forward ten elements of platform thinking in digital transformation and new business construction principles based on the mid platform architecture [14]; Chen Xinyu, Luo Jiaying, Jiang Wei, etc. (2020) pointed out that the middle office is the key support system for the digital transformation of enterprises, and demonstrated how the middle office promotes the digital transformation and achieves the purpose of enterprise economic growth through specific cases [15]; Zhang Qinglong (2020) believes that the data center is the connection point between various intelligent systems, which can promote the construction of intelligent finance and is the basis for enterprises to achieve digital transformation [16]. Because of this, the supply chain will be transformed into a supply network through the establishment of a mid platform supply chain management platform to realize the interconnection between data. In this process, make full use of big data, artificial intelligence and other digital technologies to help enterprises achieve full chain management, so as to achieve the purpose of accurate demand prediction, accurate procurement and intelligent decision-making, so as to reduce procurement costs and achieve the goal of cost reduction and efficiency increase. Moreover, the supply chain management based on the middle office enables the supply chain to have the ability of real-time, visual, perceptible and adjustable, and is more conducive to the whole basin management of enterprise group managers.

5.2.3. Building intelligent decision support

Decision making application is the embodiment of the ultimate value of financial sharing and digital transformation of enterprise groups [17]. In the future, enterprise groups should establish data-driven business decision analysis, let the data "speak", such as establishing ratio analysis models, trend prediction models, etc., convert the data of the sharing platform into visual pages, and directly present the scientific conclusions to managers and decision-makers to support decision-making, so as to help decision-makers reduce the involvement of personal emotions or subjective factors, Achieve fair, objective and reasonable scientific decision-making. Real financial visualization and decision-making standardization.

5.3. Personnel transformation, win in advance

When establishing the shared service center, J Enterprise Group is based on the transformation of financial personnel. For group employees who have the conditions and willingness to transform, they can enter the shared service center through competitive selection; The group employees mentioned here are not only the headquar-

ters, but also the financial staff of more than 300 subsidiaries under the group. The internal financial personnel are forced to transform through competitive selection. Turn traditional basic financial personnel to professional finance and business finance; Turn traditional accounting to management accounting, that is, turn the actual work focus of financial personnel to budget, mergers and acquisitions, help market or production business departments to support decision-making.

6. Conclusion and prospect

China has entered a new era, and the transformation and upgrading of enterprise financial management has become a general trend. The goal of the transformation is to form a complete strategic pattern of financial management [18]. Years of practical experience of domestic and foreign enterprises has proved that building financial sharing service centers, building new functions of management accounting, and using new technologies such as big data and artificial intelligence to accelerate the creation of higher enterprise value have become a clear, reliable and effective model in the process of financial transformation and upgrading of enterprise groups [19]. At the same time, the ultimate orientation of the development of financial sharing services is the terminal processing of data. In the future, enterprise groups need to shift their attention from the processing of financial data to the full process control of big data, and think about how to use new technologies to innovate the financial sharing mechanism, optimize the construction of information systems, so that China's financial sharing services can reach a new height.

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The authors declare no conflict of interest.

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Legitimacy, Entrepreneur Characteristics and Financing Effect of New Ventures - Evidence From Chinese Start-Ups

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Abstract: Research shows that both corporate legitimacy and entrepreneurs' personal characteristics have a significant impact on the financing effect of new ventures. However, there are few studies on the complex causal relationship between corporate legitimacy, entrepreneurs' personal characteristics and corporate financing effect. In this study, the legitimacy of new ventures is regarded as an important node of enterprise development, and the legitimacy of start-ups is regarded as two different situation variables of logical "yes" and "no" and the characteristics of entrepreneurs to complete the construction of the model. And the path to achieve high financing effect is deeply analyzed and discussed under the circumstance that the entrepreneur's personal characteristics are restricted by enterprise legality. Results show: in the enterprise legitimacy for logic "not" scenario, entrepreneurs with high education level and the business failure of personal characteristics is the necessary condition to obtain high financing effect, enterprise legitimacy as the logic of "is" scenario, entrepreneurs with high education level of personality is the necessary condition to obtain high financing effect.

Keywords: entrepreneur trait; investors; the focus; financing effect; legitimacy

Difficulty in financing has become a key problem for the survival and development of entrepreneurial enterprises. Most entrepreneurs overestimate their ability, which leads to unrealistic fantasies about investors. The strong desire for control of investors will trigger a game between entrepreneurs and investors for corporate control. [1] It can be seen that it is not easy for entrepreneurial enterprises to successfully achieve their financing intentions. In order to solve the financing problem under the complex investment and financing environment, the academic community has proposed a path for entrepreneurial enterprises to achieve high financing effects based on the theory of corporate legitimacy and high-ranking echelon theory: on the one hand, from the perspective of the relationship between corporate legitimacy and financing effects, research shows that whether the legitimacy of corporate regulation, normative legitimacy or cognitive legitimacy has a significant positive impact on the financing effects of enterprises, [2–4] on the other hand, from the perspective of entrepreneur characteristics and corporate financing effect, the research shows that the entrepreneur's personal characteristics, such as age, education level, gender, entrepreneurial experience and tenure, have a significant impact on the financing effect of new ventures [5,6].

Although the existing literature has discussed the legitimacy, the personal characteristics and the financing effect of enterprises, the existing literature mostly adopts the research paradigm of simple causality, and discusses the relationship between corporate legitimacy and corporate financing effect, and the relationship between entrepreneurial characteristics and corporate financing effect respectively. Few studies focus on the complex

causality between corporate legitimacy, the personal characteristics of entrepreneurs and corporate financing effect, this leads to the following two problems: First, research shows that corporate legitimacy has a positive impact on corporate financing, but when an enterprise does not have corporate legitimacy, how will investors judge whether to invest based on the personal characteristics of entrepreneurs? What is the financing effect of the enterprise? In particular, how is the financing effect of new enterprises? The existing literature does not provide a clear explanation of this problem. Second, although some scholars have found that the same entrepreneurial characteristics (such as gender) can also lead to completely different corporate financing effects, [7–9] how to explain this difference, especially what are the conditions and mechanisms for the formation of this difference? There is no clear answer in the existing literature.

Based on the high-order echelon theory and the perspective of investors' attention, this research regards the acquisition of corporate legitimacy of newly established enterprises as an important node of enterprise development, breaks through the analysis paradigm of marginal conditions and core conditions of traditional configuration, and uses the analysis function of Subset/superset Analysis in fsQCA software, the legitimacy of enterprises was forced into the configuration model as two different situational variables of logic "yes" and "no", and the model was constructed together with various characteristics of entrepreneurs (as shown in Figure 1). The path to achieve high financing effect for entrepreneurs' personal characteristics under the context of corporate legitimacy constraints was analyzed and discussed in depth. The research results showed that investors in the context of the lack of legitimacy of new enterprises, the main problem faced is the concern about the potential risks of startups and the misunderstanding caused by information asymmetry. At this time, investors focus on the entrepreneurs' personal characteristics that can effectively solve the above two problems; Under the circumstance that the newly established enterprise has enterprise legitimacy, the main problems faced by investors have become the analysis and judgment of the enterprise's development ability and potential. At this time, the focus is on the entrepreneur's personal characteristics that can effectively solve the above problems. This conclusion not only explains the investors' judgment basis and financing effect in the context of the lack of legitimacy of the new venture, but also analyzes and discusses the role of different entrepreneurs' characteristics in different scenarios (differences in corporate legitimacy) on the financing effect, which has both theoretical and practical significance.

1. Literature Review and Theoretical Model

1.1. The Effect of Entrepreneur's Personal Traits on Financing Effect

In the current research on entrepreneurial financing, research results based on the characteristics of entrepreneurs' gender, age, tenure, entrepreneurial experience, education level and other dimensions have been very rich:

First of all, the gender difference of entrepreneurs will bring different advantages in financing ability to entrepreneurs. MARLOW (2005) pointed out that although female entrepreneurs are generally considered to have weaker entrepreneurial ability than male entrepreneurs, [10] from the perspective of female leadership, they have unique advantages in internal information sharing, flat organization construction, decision-making power decentralization and other management aspects, [11] moreover, women are better at coordinating the internal and external interests and relationships of entrepreneurial enterprises, as well as obtaining a higher social circle through establishing a relationship network with men. [8] When entrepreneurial enterprises are embedded in high-quality social networks, weak relationships in social networks can bring heterogeneous information and social resources to entrepreneurs, promote enterprise innovation and improve the financing efficiency of entrepreneurs. [9] It can be seen that female entrepreneurs can achieve high financing efficiency by making use of their comparative advantages in building "social networks".

Secondly, the age and educational background of entrepreneurs will directly affect the judgment of investors. Relatively speaking, older entrepreneurs have the advantages of entrepreneurial experience and life experience, while young entrepreneurs will have more energy and entrepreneurial passion, and the above two characteristics are important basis for investors to judge whether to invest or not. [5] In contrast, the education

level of entrepreneurs has a more direct impact on financing. Since entrepreneurs with high education level have a greater competitive advantage in the labor market, there is a higher opportunity cost for them to choose entrepreneurship. At this time, entrepreneurs will be more cautious in their entrepreneurial decisions. It can be seen that entrepreneurs with high opportunity cost may have a greater chance of owning high-quality entrepreneurial projects and are more likely to be favored by investors [5,12].

Thirdly, entrepreneurial experience brings entrepreneurs a wealth of practical experience and entrepreneurial knowledge. [13] At the same time, entrepreneurs with rich experience can use their business and social relationships to obtain more funds, information and resources. [14] Compared with successful entrepreneurial experience, the experience of entrepreneurial failure will have two impacts on entrepreneurs: on the one hand, entrepreneurs with entrepreneurial failure experience can fully understand the hardships of the entrepreneurial process, and recognize the difficulties of entrepreneurship, thus avoiding risks in the selection of entrepreneurial activities and projects; [15] on the other hand, entrepreneurial failure experience can increase entrepreneurs' entrepreneurial passion and confidence. In the face of entrepreneurial opportunities, they will not shrink back. They have regarded entrepreneurial failure as a ticket to success. [16] The risk of entrepreneurial projects and the entrepreneurial passion and confidence of entrepreneurs are important reference conditions for investors to make investment decisions.

Finally, Michel et al. (1992) pointed out that the entrepreneur's ability to control strategic opportunities will be improved with the increase of the entrepreneur's tenure. [17] This widely accepted recognition and judgment in the academic and practical circles will also affect the investor's judgment and trust in the enterprise's growth ability and the entrepreneur's personal ability because of the entrepreneur's tenure. The knowledge will be more abundant, and the entrepreneurs will have more confidence and ability to deal with business management issues, including financing. Moreover, the tenure of the entrepreneurs, as a signal of the development of the enterprise, not only conveys the confidence of the entrepreneurs themselves to investors, but also conveys the sense of identity of enterprise employees to investors. [6] The above factors will undoubtedly affect investors' judgment on the status of new ventures and thus affect the financing effect of enterprises.

1.2. The Effect of the Legitimacy of the Venture on the Financing Effect

Financing is an unavoidable problem for start-ups. On the one hand, start-ups will face adverse selection caused by information asymmetry between banks and enterprises. [18–19] On the other hand, the high uncertainty of entrepreneurial plans of start-ups will hinder the financing effect of start-ups, then reject the financing demand of enterprises or the high risk premium in the financing process. [20] It can be seen that the newly established enterprises solve the investors' concerns about the uncertainty of the enterprise and the misunderstanding caused by the asymmetric information, which are two issues of great importance to the financing effect of enterprises.

As an important precursor resource for enterprises, organizational legitimacy plays an important role in the survival and development of enterprises. Entrepreneurial enterprises with organizational legitimacy can obtain more and more important resources from social audiences [21].

Previous studies have shown that organizational legitimacy can solve investors' concerns about potential risks of startups and misunderstandings caused by information asymmetry, and significantly promote the effect of entrepreneurial financing: Zhu Zhenduo (2015) pointed out that start-ups can promote the credibility of enterprises and the legitimacy of organizations through the construction of entrepreneurial networks, thus avoiding adverse selection and moral hazard, and alleviating the financing difficulties of start-ups. [22] Gao Hongli et al. (2017) pointed out that under the general environment of China's emerging economy, high-tech enterprises' access to government R&D support will effectively enhance investors' awareness and trust in enterprises and promote the financing effect of enterprises [23].

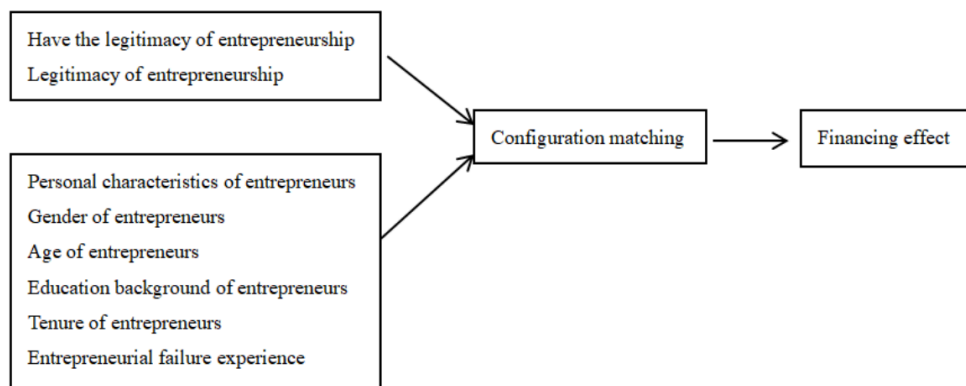
In the process of entrepreneurial practice, whether entrepreneurs can finally be recognized by investors depends not only on their personal abilities and quality characteristics, but also on the investors' judgment on the market attractiveness and project prospects of entrepreneurial projects.[24] Therefore, entrepreneurs must follow the ideas of investors, shape the corporate legitimacy of enterprises, and ensure that all business activities carried

out by enterprises meet the requirements and standards based on investors' cognitive legitimacy. [25–26] It can be seen from this that corporate legitimacy is the key condition for entrepreneurs to win recognition from investors and successfully obtain financing. In contrast, corporate legitimacy is more important for start-ups: most potential resource owners believe that start-ups do not have the resources, capabilities and qualifications to trade, [19] and most start-ups have new entry defects (the growth weakness and disadvantage of start-ups due to their newness), this defect will aggravate the uncertainty of the technology and market environment faced by new enterprises. Under this scenario, the owners of external resources will often refuse to provide resources for new enterprises lacking legitimacy [27].

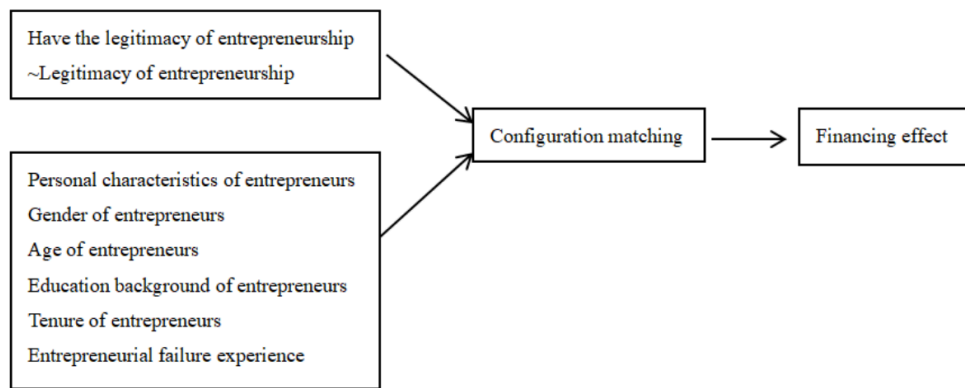
1.3. Investors' concerns

The "irrational investor hypothesis" put forward by Kahneman (1981), the winner of the Nobel Prize in Economics, has been widely accepted by the academic community. Investors often show limited rational behavior in the process of pursuing complete rationality, and most of them do not meet the theoretical standard of "completely rational investors". [28] Investors who pursue rationality are often affected by their external environment in terms of their focus and decision-making judgment. When investors are in a market that can stimulate their risk mentality, they will pay more attention to the profitability of the enterprise, while when investors are in a market that makes them conservative, they will pay more attention to the net assets of the enterprise. [29] When an enterprise has high moral hazard, investors will significantly reduce its optimal equity ratio and investment scale, while high-quality entrepreneurial projects and good personal abilities of entrepreneurs will significantly improve the optimal equity ratio and investment scale of investors [30].

Investors will use all kinds of information available to them to make investment judgments and decisions. Corporate legitimacy is important information reflecting the entrepreneurial status of enterprises. Whether entrepreneurial enterprises have corporate legitimacy will directly affect investors' judgments on corporate risk, profitability and sustainable development, Therefore, from the perspective of corporate legitimacy, exploring the relationship between entrepreneurs' personal characteristics and entrepreneurial financing effects can objectively analyze the changes of investors' focus and the impact of entrepreneurs' personal characteristics on entrepreneurial financing effects. Based on the theory of high echelon team and the theory of organizational legitimacy, this study adopts the fuzzy set qualitative comparative analysis method, The enterprise legitimacy variable is used as a logical "yes" and "no" state to complete the construction of the configuration research model together with the characteristics of entrepreneurs (as shown in Figure 1), and the investor's judgment basis and financing effect of the new venture in the absence of legitimacy, as well as the role of different entrepreneurial characteristics in different scenarios (differences in corporate legitimacy) on financing effect are analyzed and discussed.



(a)



(b)

Figure 1. Configuration model of this study. (a) Configuration analysis in the context of enterprise legitimacy; (b) Configuration analysis in the absence of enterprise legitimacy. Note: "~" in the drawing means "no".

2. Research Design

2.1. Research Methods and Design

The method selection and design in this paper are mainly based on the following two reasons: First, the FsQCA fuzzy set qualitative comparative analysis method solves an important limitation of the csQCA clear set qualitative comparative analysis, that is, the demand for binary variables. Binary variables cannot fully explain the complex situation of natural changes due to the level or degree. The variables involved in this study are suitable for the FsQCA fuzzy set qualitative comparative analysis method to carry out research. [31] Second, FsQCA fuzzy set qualitative comparative analysis, as a method to explore "interaction" and "joint effect", has been accepted and widely used by the academic community. [32] Finally, according to the needs of the theoretical construction and research design of this study, in order to achieve the goal of configuration analysis of the two specific states of "yes" and "no" of the former dependent variable logic of enterprise legitimacy and the characteristics of entrepreneurs, this study selected the Subset/Superset Analysis (Subset/Superset Analysis) analysis function in the fsQCA software. The paper analyzes the different configuration models composed of the two logical "yes" and "no" states of the former dependent variable of enterprise legitimacy and the characteristics of entrepreneurs respectively, and analyzes and discusses the paths for entrepreneurs to achieve high financing effects based on their own characteristics under the context of enterprise legitimacy constraints.

The design and specific implementation steps of this study are as follows: First, according to the characteristics of variables involved in this study and the requirements of the qualitative comparison method of FsQCA fuzzy sets, the data assignment and calibration of variables are completed. Secondly, the analysis function of Subset/Superset Analysis (Subset/Superset Analysis) in the fsQCA software is used to complete the configuration analysis of the two specific states of the logic "yes" and "no" of the antecedent variable of enterprise legitimacy and the characteristics of entrepreneurs; Third, the configuration set is further filtered. The deletion criteria are: consistency between 0.8–0.9 is selected as the judgment criterion for configuration sufficient conditions, and original coverage greater than 13% is selected as the filter condition for further configuration interpretation. [33] Fourth, based on the filtered configuration set, judge the necessary conditions of the result variable. The judgment basis is: the following situations occur in the three antecedent conditions of ABC that may lead to the same result: Path 1: The combination of Condition A and Condition B leads to the result, and Path 2: The combination of Condition A and Condition C leads to the result, so judge A is the necessary condition for the result. [34] The fifth step is to compare and analyze the theoretical assumptions and conclusions of this study, and conduct a dialogue with the literature.

2.2. Samples and data sources

This research mainly uses the questionnaire method to collect the research data. The students of the Young

Entrepreneurs Innovation and Entrepreneurship Class of Sun Yat-sen University are the main research objects. With the snowball sampling method, 600 questionnaires are sent out, and 294 questionnaires are retrieved. The recovery rate is 49%. The sample data collected are deleted according to the following two steps: First, According to the criteria for the classification of newly established enterprises, 51 enterprise samples with a history of more than three years [35] were excluded. Secondly, 25 invalid questionnaires with incomplete filling, tendentious and regular answers were excluded. Finally, 218 valid questionnaires were obtained, with an effective rate of 74.15%. FsQCA fuzzy set qualitative comparison method requires that the sample data volume should cover all antecedent configurations that may lead to specific results. Since this study has six antecedent conditions, such as innovation, it theoretically requires at least 27 sample enterprises. [36] It can be seen that 218 enterprise samples can fully meet the analysis requirements of two different methods, and ensure the internal validity of the results.

2.3. Variable selection and measurement

2.3.1. Characteristics of entrepreneurs

Drawing on the practice of Zhang Huiyu et al. (2015), the characteristics of entrepreneurs based on demographic variables are treated as follows: gender of entrepreneurs: male assigned 1, female assigned 0; Age of entrepreneurs: the natural age of entrepreneurs in the questionnaire; Entrepreneur education level: from low to high, it is divided into four levels: senior high school and below, junior college, undergraduate and graduate students and above, with values of 1 to 4 respectively. [37] Drawing on Chen Xiaohong's (2013) practice, this study takes the natural logarithm of the number of days entrepreneurs hold office as a measurement indicator of their tenure [6].

Refer to the concept of entrepreneurial failure proposed by McGrath (1999): entrepreneurs terminate or withdraw from entrepreneurial activities without achieving their set goals. [38] Referring to the practice of Yang Xueru et al. (2019), we adopted the GEM questionnaire item: "Have you closed or terminated your own business in the past 12 months or more?", respondents answered "Yes" to assign a value of 1, and "No" to assign a value of 0 [39].

2.3.2. Enterprise legitimacy

The corporate legitimacy mentioned in this study refers to the cognitive legitimacy conditions accumulated by new enterprises in the process of entrepreneurship. Cognitive legitimacy is mostly the subjective judgment of stakeholders. For new enterprises, it is flexible and easy to obtain. In contrast, there are certain judgment standards for regulatory legitimacy and regulatory legitimacy, which are not easy for new enterprises to obtain. [40] For the enterprise legitimacy variables based on this study, refer to Zhao Wenhong et al. [41] and Du Yunzhou et al. [42], who adopted "customers highly value your company's products/services", "employees will proudly tell others that they are members of the company", "investors are willing to contact your company", "suppliers want to do business with your company" "Competitors respect your company very much" and "The government highly appraises the business behavior of enterprises" are six items to measure the organizational legitimacy of new enterprises.

2.3.3. Financing effect

This study draws on Xiang Guopeng et al.'s (2019) measurement of financing availability [43]: based on the research objectives and needs of this study, the financing effect is defined from two aspects: first, the Likert 5-point scale is used to measure financing availability from three dimensions: "self-perceived financing satisfaction", "financing satisfaction compared with enterprises and industries" and "self-perceived enterprise financing capability"; second, build a more objective financing satisfaction measurement method for the matching degree of financing results and financing willingness: and design two questions in the questionnaire: "whether to successfully obtain financing" and "whether to have financing willingness". Divide all samples into two situations: 1 for those who have financing willingness and successfully obtain financing, and 0 for those who do not. The specific data calibration and assignment of variables are shown in Table 1.

3 Data analysis

3.1. Data calibration

According to the data form collected by the variable measurement standard, there are three categories of continuous data, (0, 1) category data and grade data. Using the data calibration method and calculation method adopted by Fiss (2011) when using the fsQCA fuzzy set qualitative comparative analysis method, this study constructed the detailed measurement and assignment method and description of each variable (see Table 1) [44].

Table 1. Method and description of detailed measurement and assignment of each variable.

Variable Type	Variable Name	Variable definition	Operational definition of variables	Assignment description	Assignment
Result variable	Financing effect	Availability of financing	Average financing availability plus a standard deviation	Full subordination	4.342
			Average financing availability minus one standard deviation	Not affiliated at all intersection	1.392
		Financing satisfaction	Average financing availability	Yes	2.867
			The case that there is financing intention and financing is successfully obtained	No	1
		Not the case that there is financing intention and financing is successfully obtained		0	
Conditional variable	Gender of entrepreneurs (GEN)		The entrepreneur is male	Male	1
			The entrepreneur is female	Female	0
	Age of entrepreneurs (AGE)		≥55	Full	1
			45~54	Partial	0.67
			35~44	Partial not	0.33
			≤34	Not at all	0
	Personal characteristics of entrepreneurs (EDU)	Education level of entrepreneurs (EDU)	Graduate degree or above	Full	1
			Bachelor Degree	Partial	0.67
			College degree	Partial not	0.33
	Failure experience (EF)		High school education and below	Not at all	0
			Have you closed or terminated your own business in the past 12 months or more?	Yes	1
				No	0
Tenure (TEN)		The average tenure of entrepreneurs plus a standard deviation	Full subordination	4.678	
		The average tenure of entrepreneurs minus one standard deviation	Not affiliated at all	1.442	
		Average tenure of entrepreneurs	intersection	3.060	
		The average value of enterprise legitimacy plus a standard deviation	Full subordination	6.580	
		The average value of enterprise legitimacy minus one standard deviation	Not affiliated at all	4.532	
Scenarios of entrepreneurship (LE)	Enterprise legitimacy (LE)	Average value of enterprise legitimacy	intersection	5.556	

3.2 Analysis of necessary conditions

According to the analysis requirements of the qualitative comparison method of fsQCA fuzzy sets, this study uses the Necessity Conditions function of fsQCA software to complete the consistency and coverage test of QCA, and analyze the relationship between the necessity and sufficiency of conditions and result variables (see Table 2).

Table 2. Univariate consistency and coverage.

Conditional variable	Consistency	Coverage
EDU	0.590652	0.607248
EF	0.469747	0.372435
GEN	0.479567	0.751328
AGE	0.589737	0.606728
LE	0.587089	0.646320
TEN	0.431565	0.192251

Source: original results generated by fsQCA3.0.

The consistency test when the result variable "Outcome=1" shows that all conditional variables are lower than 0.8, in the coverage test, all conditional variables did not exceed 0.8. From the perspective of the necessity and sufficiency of a single variable, the antecedent conditions in the model are not necessary preconditions for the result variable. The financing effect of an enterprise does not depend on a single variable, but on the compre-

hensive effect of various variables. Therefore, it is necessary to analyze the combination effect of each conditional variable.

3.3. Conditional configuration analysis

3.3.1. Superset analysis

In order to achieve the research goal of using enterprise legitimacy variables as logical "yes" and "no" states and entrepreneurial traits to complete configuration analysis, this research uses the Subset/Superset Analysis function in fsQCA software to enter the configuration model as logical "yes" and "no" states respectively.

The analysis results of enterprise legitimacy variables as logical "no" and entrepreneurs' personal characteristics include 64 different configurations, including 32 configurations including ~LE (enterprise legitimacy variables are logical "no"). Table 3 is obtained after the 32 configurations are ranked from high to low according to consistency. Referring to the practice of Wang Yingwei (2020), consistency between 0.8-0.9 and 0.9-1 is taken as the judgment standard of configuration sufficient conditions [33]. It can be seen that the configurations in Table 3 that meet the judgment standard of sufficient conditions are A1 and A2, where the consistency of A1 configuration is 0.829056, and the original coverage rate reaches 0.257323, It shows that the consistency of the configuration meets the criteria and the configuration conditions can explain more than 25% of the cases, with strong explanatory power; The consistency of A2 configuration is 0.818600, and the original coverage rate is 0.268688, which shows that the consistency of this configuration meets the criteria and the configuration conditions can explain more than 26% of the cases, so it is necessary to further analyze and explain A1 and A2 configurations.

Under the scenario that the legitimacy of the enterprise is a logical "no", the paths of the conditional configuration A1 and A2 for the new enterprise to achieve high financing effect are EF * EDU * AGE * ~ LE and EF * EDU * ~ LE respectively. A1 shows that entrepreneurs with entrepreneurial failure experience, high education level and high entrepreneurial age are sufficient conditions for enterprises to obtain high financing effects under the situation where the legitimacy of enterprises is a logical "no". A2 shows that entrepreneurs with entrepreneurial failure experience and high education level are sufficient conditions for enterprises to obtain high financing effects under the situation where the legitimacy of enterprises is a logical "no". It can be seen that the two sufficient condition configurations include EF (entrepreneurial failure experience) and EDU (high education level). Based on the criteria for determining the necessary conditions of the qualitative comparison method of fsQCA fuzzy sets, when the same antecedent condition appears in two different combinations of sufficient conditions, it can be determined that the condition is a necessary condition for the result. [34] Therefore, entrepreneurship failure experience and high education level are the necessary conditions for enterprises to obtain high financing effect when the legitimacy of enterprises is a logical "no" situation.

Research conclusion 1: EF (entrepreneurial failure experience) and EDU (high education level) are the necessary conditions for enterprises to obtain high financing effect when the enterprise legitimacy is a logical "no" scenario.

Table 3. A set of configurations whose enterprise legitimacy is a logical "no".

Conditional Combination	Terms	Consistency	Raw coverage	Combined
A1	EF*EDU*AGE* ~ LE	0.829056	0.257323	0.288412
A2	EF*EDU* ~ LE	0.818600	0.268688	0.296352
A3	EDU* ~ LE	0.783378	0.480974	0.477725
A4	EDU*GEN* ~ LE	0.784770	0.376535	0.416997
A5	EDU*AGE* ~ LE	0.780322	0.381444	0.412791
A6	EDU*AGE*GEN* ~ LE	0.775333	0.288797	0.341918
A7	EF*AGE* ~ LE	0.774457	0.223094	0.302008
A8	EF*EDU*AGE*GEN* ~ LE	0.767500	0.107036	0.204969
A9	EF*EDU*GEN* ~ LE	0.761400	0.127078	0.215193
A10	AGE* ~ LE	0.762580	0.485825	0.419504
			
A32	EF*AGE*GEN* ~ LE*TEN	0.423885	0.025817	0.021069

Note: "*" in the table represents "and", and "~" represents "no".

The analysis results of the configuration of enterprise legitimacy variables as logical "yes" and entrepreneurs' personal characteristics include 64 different configurations, including 32 configurations including LE (enterprise legitimacy variables as logical "yes"). Table 4 is obtained after the 32 configurations are ranked from high to low in accordance with consistency. Referring to the above practice of using consistency between 0.8-0.9 as the judgment standard of configuration sufficient conditions and consistency between 0.9-1 as the judgment standard of configuration necessary conditions, it can be seen that the configurations meeting the judgment standard of sufficient conditions in Table 4 are B1 and B2, of which the consistency of B1 configuration is 0.882346, and the original coverage rate reaches 0.343558, indicating that the consistency of this configuration meets the judgment standard and the configuration conditions can explain more than 34% of cases, strong explanatory power; The consistency of B2 configuration is 0.873169, and the original coverage rate is 0.458067, which shows that the consistency of this configuration meets the criteria and the configuration conditions can explain more than 45% of the cases, with strong explanatory power. Therefore, it is necessary to further analyze and explain B1 and B2 configurations.

In the case that the legitimacy of the enterprise is a logical "yes", the paths of configuration B1 and B2 for new enterprises to achieve high financing effects are EDU * GEN * LE and EDU * LE respectively. B1 shows that in the case that the legitimacy of the enterprise is a logical "yes", high education level and high entrepreneurial age of entrepreneurs are sufficient conditions for enterprises to obtain high financing effects, B2 shows that in the situation where the legitimacy of the enterprise is logical "yes", a high level of education for entrepreneurs is a sufficient condition for enterprises to obtain high financing effects. It can be seen that EDU (high education level) is included in the two sufficient condition configurations. Based on the necessary condition criteria of the fsQCA fuzzy set qualitative comparison method, it can be judged that high education level is a necessary condition for enterprises to obtain high financing results when the legitimacy of enterprises is a logical "yes".

Research conclusion 2: EDU (high education level) is a necessary condition for enterprises to obtain high financing effect under LE (the situation where the legitimacy of enterprises is logical "yes").

Table 4. The configuration set of enterprise legitimacy is a logical "yes".

Conditional Combination	Terms	Consistency	Raw coverage	Combined
B1	EDU*GEN*LE	0.882346	0.343558	0.385777
B2	EDU*LE	0.873169	0.458067	0.421897
B3	EDU*AGE*LE	0.763289	0.361474	0.359336
B4	EDU*AGE*GEN*LE	0.759806	0.262958	0.298607
B5	AGE*LE	0.746397	0.491402	0.384207
B6	EF*EDU*AGE*LE	0.747853	0.150549	0.208697
B7	AGE*GEN*LE	0.737521	0.358373	0.296996
B8	EF*EDU*LE	0.729500	0.166569	0.187681
B9	EF*AGE*LE	0.716786	0.212329	0.207605
B10	EDU*TEN*LE	0.718077	0.113691	0.145409
			
B32	EF*GEN*LE*TEN	0.410550	0.031290	0.020315

Note: "*" in the table represents "and", and "~" represents "no"

3.3.2. Robustness check

This paper uses the method of changing variable measurement to test the robustness of the research results. That is, it will be the case of financing willingness and successful financing, and the value is 1 (including the sample of "financing willingness and successful financing"); It is not the case that there is financing intention and financing is successfully obtained, and the value is 0 (including the samples of "no financing intention and financing is not obtained", "no financing intention but financing is successfully obtained" and "financing intention but financing is not obtained"), and the robustness of the research results is judged by referring to the two standards of different configuration fitting parameters and different configuration set relationship states proposed by Schneider (2012), [45] the conclusion is that the research results in this paper are robust and reliable.

4. Research conclusion and management enlightenment

4.1. Conclusion and discussion of the study

This research has studied and discussed the configuration and path for entrepreneurs to achieve high financing effects based on their own characteristics under the context of corporate legitimacy constraints. From the perspective of cognitive legitimacy theory, this research uses the Subset/Superset Analysis (subset/superset analysis) analysis function of fsQCA software to complete the analysis of the configuration research model by taking corporate legitimacy variables as logical "yes" and "no" states and entrepreneurial characteristics, referring to the criteria of sufficient conditions and necessary conditions adopted in relevant literature, [33,34] determined the analysis process of configuration (as shown in Figure 2), and finally obtained two conclusions.

It can be seen from conclusion 1 that: EF (entrepreneurial failure experience) and EDU (high education level) are \sim LE (under the situation that the legitimacy of the enterprise is a logical "no"), which are necessary conditions for enterprises to obtain high financing effects. Under the situation of lack of corporate legitimacy, investors will face relatively greater risks. However, start-ups cannot alleviate investors' concerns about the potential risks of start-ups and misunderstandings caused by information asymmetry through corporate legitimacy. At this time, investors focus on the potential risks of start-ups and misunderstandings caused by information asymmetry. Therefore, the entrepreneurial failure experience and high education level of entrepreneurs have become the necessary conditions for new enterprises to obtain high financing effects.

First, the role and effect of information transmission of entrepreneurs' failed entrepreneurial experience. On the one hand, the failed entrepreneurial experience can enable entrepreneurs to fully understand the hardships of the entrepreneurial process, and recognize the difficulties of entrepreneurship, so as to avoid risks in the selection of entrepreneurial activities and projects. [15] This trait objectively strengthens the entrepreneurs' coping ability and handling experience after various risks encountered in the entrepreneurial process, and effectively avoids entrepreneurial risks, to some extent, this can effectively alleviate investors' concerns about the potential risks of entrepreneurial enterprises and promote the financing effect of enterprises. On the other hand, people who have experienced entrepreneurial failure choose entrepreneurship again, which shows that they are more passionate and confident about entrepreneurship and will not shrink back when faced with entrepreneurial opportunities. [5] The passion and confidence of entrepreneurs can effectively drive enterprises to better identify entrepreneurial opportunities and help enterprises grow rapidly. [46] Ho et al. (2011) further pointed out that entrepreneurial passion will directly lead to high performance of enterprises. [47] From this perspective, entrepreneurs who have experienced entrepreneurial failure are relatively more passionate and confident about entrepreneurship, which plays a role in improving entrepreneurial performance to a certain extent, and the entrepreneurial effect of entrepreneurs' entrepreneurial failure experience is exactly what investors pay attention to and expect, which can alleviate the misunderstanding caused by information asymmetry. It has played an important role in helping investors comprehensively and objectively evaluate the venture financing projects, thus promoting investors' investment decisions and improving the financing effect of venture enterprises.

Second, the role and effect of information transmission played by the high education level of entrepreneurs. Workers with higher education level who have greater competitive advantage in the labor market will have a relatively higher opportunity cost when choosing to start their own businesses. At this time, entrepreneurs will be more careful in their entrepreneurial decisions. Once they decide to start their own businesses, they will have a higher probability of having high-quality entrepreneurial projects. [12] It can be seen that entrepreneurs' high education level actually conveys to investors the information that entrepreneurial financing projects are probably high-quality entrepreneurial financing projects, the transmission of this information can further alleviate the misunderstanding caused by information asymmetry, help investors better understand entrepreneurs and venture financing projects, and improve the financing effect of enterprises.

To sum up, in the absence of corporate legitimacy, the entrepreneurial failure experience and high education level of entrepreneurs can help investors observe and judge the situation of entrepreneurial financing projects from different perspectives: the entrepreneurial failure experience of entrepreneurs will help investors judge their ability to deal with risks and manage enterprises from the perspective of their personal capabilities, and thus play a role in influencing investors' decisions. The high education level of entrepreneurs will help investors to judge

the investment value of enterprises from the perspective of the quality of entrepreneurial projects, and thus play a role in influencing investors' decisions. It can be seen that the high education level and entrepreneurial failure experience form complementary information, which conveys the key information about the entrepreneur's ability and the quality of entrepreneurial projects to investors, solves the investors' concerns about the potential risks of entrepreneurial enterprises and misunderstandings caused by information asymmetry, thus promoting the improvement of financing effects.

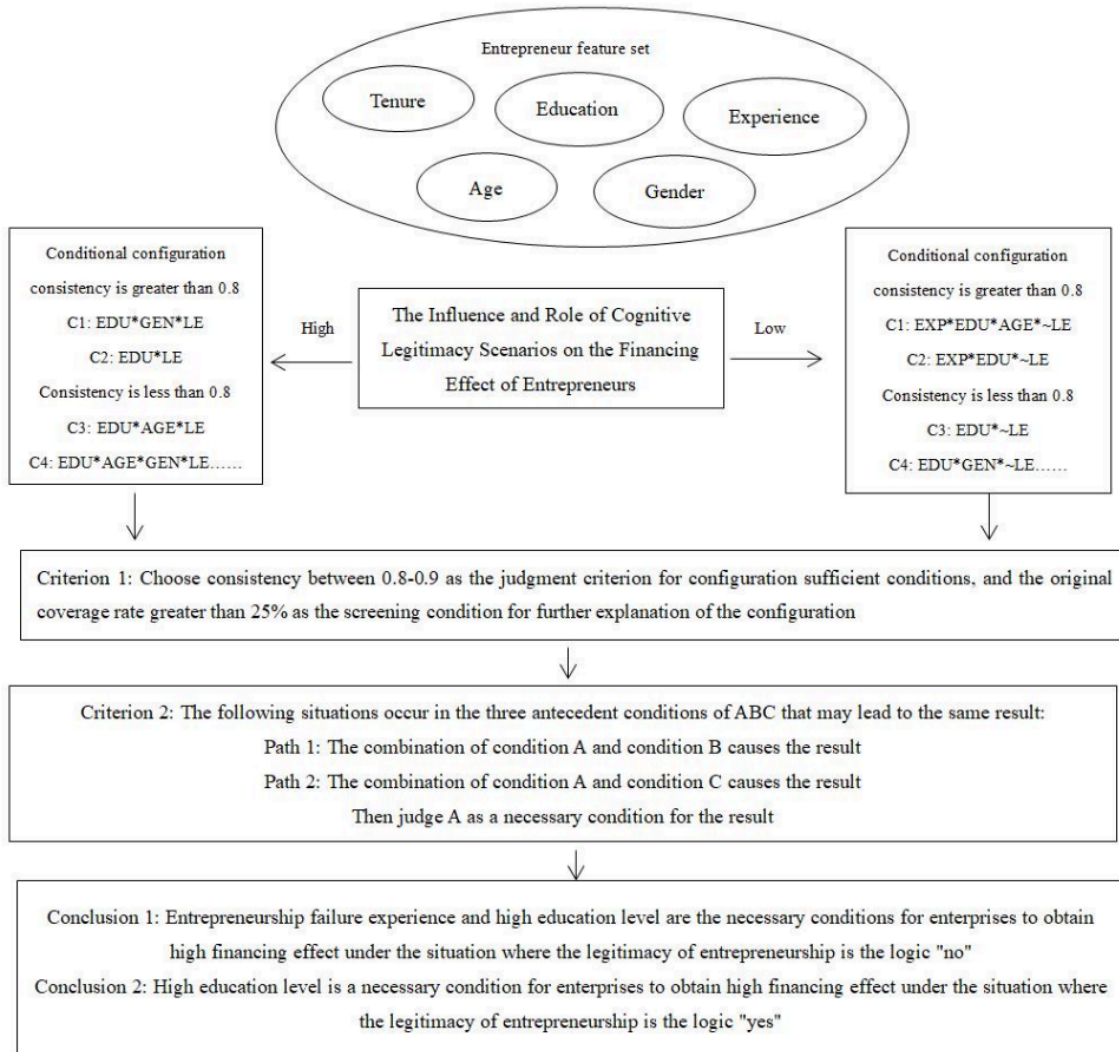


Figure 2. Analysis process diagram of configuration. Note: Judgment standard 1 in the figure is from reference [33], and judgment standard 2 in the figure is from reference [34].

It can be seen from conclusion 2 that: EDU (high education level) is a necessary condition for enterprises to obtain high financing effect under LE (the situation where the legitimacy of enterprises is logical "yes"). Under the circumstance that a newly established enterprise has enterprise legitimacy, investors will face relatively small investment risks. The start-up enterprise has successfully completed the requirements and standards of investor based cognitive legitimacy, shaped the legitimacy of the enterprise, and solved the misunderstanding caused by investors' concerns about the potential risks of the start-up enterprise and information asymmetry, at this time, investors focus on the future development potential and growth ability of the enterprise. Therefore, the high education level of entrepreneurs has become a necessary condition for new enterprises to obtain high financing effects.

On the one hand, high education level is an important factor for achieving high growth performance, and previous studies have shown that the education level of entrepreneurs will significantly and positively affect the

growth performance of enterprises, especially in regions with high marketization and high-tech industries. [48] On the other hand, education level is often regarded as a measurement indicator of entrepreneurs' information processing ability. Entrepreneurs with high education level are more capable of finding, interpreting and analyzing new opportunities, [49] and then their innovation ability will be stronger. As the research result of Van der Sluis (2003) shows, when entrepreneurs have higher education level, their ability to identify entrepreneurial opportunities and grasp innovation will be stronger. [50] It can be seen that under the situation of corporate legitimacy, the newly established enterprises no longer bear the responsibility of transmitting to investors the information that entrepreneurial financing projects are probably high-quality entrepreneurial financing projects (organizational legitimacy has already transmitted this information). At this time, the high education level has transmitted to investors the information that enterprises have strong ability to create growth performance, identify opportunities and grasp innovation, this information has become an important basis for investors to judge the growth potential and innovation ability of enterprises, and objectively plays a role in helping investors to have a more comprehensive understanding of entrepreneurs and entrepreneurial financing projects, and improving the financing effect of enterprises.

To sum up, the focus of investors when making investment decisions will change according to the changes in the legitimacy of the enterprise. In the case of the lack of legitimacy of a new venture, the focus of investors is on the potential risks and information asymmetry of the venture. At this time, entrepreneurial failure experience and high education level are the necessary conditions for enterprises to obtain high financing effects in the case of the logical "no" legitimacy of enterprises; Under the circumstance that the newly established enterprise has the legitimacy of the enterprise, the focus of investors has become the development ability and potential of the enterprise. High education level is a necessary condition for the enterprise to obtain high financing effect under the circumstance that the legitimacy of the enterprise is "yes".

4.2. Enlightenment of management

The conclusion of this study proves that whether a new venture has corporate legitimacy or not, it can obtain high financing effect through the combination of entrepreneurs' personal characteristics. Investors also pay attention to different focuses in the context of different corporate legitimacy, and the mechanism of the same entrepreneur's characteristics in different scenarios is also different: First, Since the focus of investors' attention when making investment decisions will change according to the legitimacy of the enterprise, new enterprises must adapt to the focus of investors' attention according to their own development status if they want to win the favor of investors and successfully obtain financing. Under the situation of lack of legitimacy, new enterprises should focus on solving investors' concerns about the potential risks of startups and misunderstandings caused by information asymmetry; In the context of the legitimacy of new enterprises, efforts should be made to solve the confusion of investors in the analysis and judgment of the development ability and potential of enterprises. Secondly, entrepreneurs' failed entrepreneurial experience and high education level can effectively solve investors' concerns about the potential risks of startups and misunderstandings caused by information asymmetry in the context of the lack of legitimacy of startups, so they can achieve high financing results. The high level of education can effectively solve the investors' confusion about the analysis and judgment of the enterprise's development ability and potential under the situation that the new enterprise has the enterprise legitimacy, so it can achieve high financing effect. Finally, although entrepreneurs have the same characteristics, there are differences in the information they transmit to investors in different situations, education level, a conditional variable, will be regarded by investors as an important indicator to judge the growth potential and innovation ability of enterprises. It can be seen that there are differences in the functional mechanism of the same entrepreneurial characteristics under different scenarios (differences in corporate legitimacy).

4.3. Future expansion direction

Although this paper has studied the path to achieve high financing effect under the situation of corporate legitimacy constraints, and analyzed and discussed the role of different entrepreneurial characteristics in different situations (corporate legitimacy differences) on financing effect, which has certain theoretical and practical

significance, this paper still has certain limitations and shortcomings: First, in addition to cognitive legitimacy, the organizational legitimacy of entrepreneurial enterprises also includes normative legitimacy and regulatory legitimacy. Although cognitive legitimacy is easier to obtain for start-ups, the existence of the other two legitimacy cannot be ruled out. Therefore, the impact of normative and regulatory legitimacy on the financing effect of start-ups needs further research; Secondly, this study selects demographic variables in general sense as measurement variables of entrepreneurs' personal characteristics, but entrepreneurs may also have some special personal characteristics, such as entrepreneurs' personal experiences of "Great Famine", [51] entrepreneurs' early "poverty" experience, etc. [52] Whether these special experiences have an impact on the financing effect of new enterprises needs further analysis and discussion. Finally, the sample of this study is the newly established enterprises whose establishment time is less than three years. For other types of enterprises, whether the conclusions of this study are still valid needs further testing and discussion.

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A.S. is mainly responsible for writing and revising papers. X.T. is mainly responsible for the design and revision of the theoretical framework of the thesis. R.X. is mainly responsible for data collection and data analysis. All of the authors read and agreed to the published the final manuscript.

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Data is available upon request from the corresponding authors.

Conflicts of Interest

The authors declare no conflict of interest.

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Research on Online Shopping Addiction Based on Flow Theory

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Abstract: From the perspective of consumer experience, this study constructs the influence model of flow experience on online shopping addiction, analyzes and discusses the influencing factors and mechanism of irrational purchasing of domestic consumers in the context of online shopping. Through the empirical test of the model, it is confirmed that in the process of online shopping, creating or improving the sense of immersive presence, enhancing consumers' focus and time distortion can positively affect impulsive buying. The exploratory behavior of consumers promotes their learning and rational thinking, but inhibits their impulse to buy. Impulsive buying fully mediates the relationship between presence, concentration and time distortion, while behavioral repetition moderates the relationship between impulse buying and online shopping addiction. This study confirmed the importance of extreme shopping experience on irrational purchase decision, clarified the mechanism of the influence of each dimension of flow experience on irrational purchase decision, and provided a new idea for the study of consumers' irrational purchase.

Keywords: online shopping addiction; impulsive buying; flow theory

1. Introduction

The outbreak of COVID-19 has given consumers more time to browse and shop online. The e-commerce platform has been upgraded from graphic and text to short video and live e-commerce. Combined with endless marketing methods, the e-commerce platform has created an extremely more immersive shopping experience, which has greatly ignited consumers' buying enthusiasm and impulse to place orders. In 2021, the country's online retail sales reached 13.1 trillion Yuan, up 14.1 percent year on year, 3.2 percentage points faster than the previous year, data showed. Studies have shown that more than 50% of online purchases can be classified as impulsive purchases [1]. Not only impulsive buying is a huge market, but addictive buying also constitutes a large market [2] and is constantly growing [3].

Previous studies believe that addicts are affected by anxiety and stress, low self-esteem, external environmental stimuli and other factors [4] In order to improve self-esteem, reduce tension and escape negative emotions, they choose to engage in addictive consumption [5]. Some scholars have studied the influence of consumer shopping sentiment [6], materialism, hedonism and other perspectives on irrational purchasing behavior. However, in the context of online shopping, irrational purchasing behavior, especially online shopping addiction, is obviously insufficient. The characteristics of shopping addiction are described more, and empirical research on the determinants and formation mechanism of online shopping addiction is obviously insufficient. In view of that the flow experience theory has strong explanatory power and important significance in explaining the

emotional and cognitive factors that affect online consumer behavior, this paper studies the formation mechanism and influence of online shopping addiction from the perspective of flow experience of consumer experience.

2. Literature review and research hypotheses

2.1. Literature review

2.1.1. Flow theory

Flow experience describes the overall feeling when people are fully engaged in an action. That is, when people are in a state of flow experience, they will enter a common experience mode, completely immersed in their own activities. Psychological states such as narrowing of the focus of self-awareness, loss of self-awareness, clear goal, clear feedback, and sense of control over the environment are displayed [7]. As an important theory of positive psychology, it has been widely used in education, information system, marketing and other fields since it was put forward. In 1996, Hoffman & Novak applied the flow theory to the field of marketing, believing that the flow experience of consumers is generated in the process of purchasing goods, determined by high-level skills and challenges, and focused attention, and enhanced by interaction and presence. Recent studies have also confirmed that flow experiences can evoke positive subjective experiences and attitudes [8] enhance participation, learning, and exploration behaviors [9]. It also has a positive impact on purchase intention and customer loyalty [10–11]. Unlike immersion experience, flow does not occur easily and requires the combined effects of factors such as balance of skill and challenge, perceived fun and interactivity, cognitive experience and emotional experience [12].

2.1.2. Impulsive buying

It is generally believed that irrational buying can be divided into impulsive buying and addictive buying. Impulsive buying was first described simply as unplanned buying behavior [13]. Beatty & Ferrell (1998) expanded the concept of impulsive buying, believing that impulsive buying is a spontaneous behavior without planning and task intention before buying, and is reckless of the consequences [14]. Berlin & Hollander (2014) believe that impulsivity refers to actions without sufficient thinking, or unplanned reactions that tend to be quick and without considering the consequences of actions [15]. Sharma, Sivakumaran, & Marshall (2010) define impulse buying as a sudden, hedonic and complex purchase behavior driven by strong hedonic temptation that can immediately satisfy and improve emotions [16]. And there are few behavioral constraints to resist this temptation [17]. Although different scholars have different definitions of impulsive buying, the basic characteristics of impulsive buying include: unplanned buying behavior, being stimulated by the outside world, made in a very short time, accompanied by strong emotions, and ignoring the consequences.

2.1.3. Addictive buying

Research on shopping addiction stems from compulsive buying and compulsive buying disorder. Some of its symptoms are similar to those of addiction, such as craving, withdrawal, tolerance, withdrawal reaction, conflict and loss of control [18]. Therefore, this paper uses shopping addiction as a substitute for compulsive buying without making too many distinctions. Online shopping addiction is described as an uncontrollable impulse to buy [19], which shows that online shopping addiction is associated with impulsive buying to some extent. Faber & Oguinn (1992) believe that it is a chronic and repeated purchase in response to negative events or feelings [20]. Most of the previous studies attributed compulsive buying to the individual's low arousal level, anxiety, seeking for pressure release, stimulation from external environment, and attempt to extricate from negative emotional states (such as low self-esteem), etc. [4]. On the whole, compulsive purchasing behavior has negative consequences for individuals in the long run. Instead of alleviating emotions, it can aggravate negative emotions (such as depression, frustration, guilt, etc.), and may lead to a high level of debt and many legal and social relationship problems [21].

2.1.4. Flow experiences, impulsive buying, and shopping addiction

The flow experience is the ideal state of being so absorbed in an activity that you forget the passage of time and immerse yourself in it. In this state, it is easy to arouse consumers' positive emotions [22], have better expectations for commodities, and make irrational impulse buying behavior [23].

According to the theory of self-control disorder, self-control ability is a limited resource that will be exhausted [24]. A person's self-control ability will not remain unchanged over time, and it will be worn out in the execution of tasks and may be exhausted, leading to short-vision in decision-making. Impulsive buying represents a certain amount of self-control. When repeated changing behaviors constantly consume this resource, self-control will be completely lost, that is, shopping addiction.

Trait activation theory describes the interaction process of a person's trait, emotional state and situation. Trait expression occurs under the stimulus triggered by situation and affects a person's behavior. Flight et al., (2012) believed that positive emotion is related to impulsive purchase tendency, while negative emotion is related to intrinsic addictive purchase tendency [25]. Impulse buying is driven by positive emotions. If this type of behavior occurs repeatedly, it will show the increase of desire and decline of willpower, and the positive influence of impulse buying will be weakened, which will be gradually replaced by negative emotions and feelings, and eventually uncontrollable buying addiction will develop from impulse buying that loses cognitive control.

According to the above theory, impulsive buying is often driven by positive emotions, and in the process of repeated reinforcement, negative emotions are gradually accumulated and strengthened, and eventually develop into uncontrollable addictive behaviors.

2.2. Research hypothesis

In order to more comprehensively analyze the influence of various dimensions of psychological experience on online shopping addiction, this paper, based on the opinions of Novak, Hoffman & Yung (2000), divides flow experience into four dimensions: presence, concentration, time distortion and exploratory behavior, and studies the influence of each on impulsive buying [26]. The conceptual model is shown in the Figure 1.

Existing studies show that the sense of presence can enhance customers' trust [27], reduce their worries about merchants and commodities [28], and thus stimulate consumers' impulsive buying. The high sense of presence caused by interaction makes consumers consciously immersed in the online shopping scene and generate a pleasant psychological feeling, which is easier to stimulate impulsive buying. The presence stimulation of shopping websites has a positive impact on consumers' emotions and psychological states [29], which can often reduce the complexity of decision-making, shorten decision-making time [30], feel unconstrained, and more likely to trigger irresistible impulse to buy [31]. Accordingly, the following hypotheses are proposed:

H1: Presence has a positive effect on online impulsive buying.

Concentration refers to the focus of individual attention on a limited stimulus domain [7]. Assael (1992) believed that by focusing on shopping websites, more marketing information from merchants could be received and unplanned purchases could be increased [32]. The research of Xu et al. (2020) confirmed that in the live-streaming shopping scenario, consumers are more likely to be stimulated by platform marketing programs and make impulsive and irrational purchase decisions [33]. Hsu et al. (2012) also confirmed that concentration is positively correlated with purchase intention and impulse [34]. Accordingly, the following hypotheses are proposed:

H2: Focus has a positive impact on online impulsive buying.

When consumers actively participate in an activity, they tend to feel that time flies [35], and this distortion of time perception will have a positive attitude towards purchase intention, and then produce a pleasant experience [36]. In other words, consumers who experience high levels of time-warping feelings show more positive emotional responses and are more likely to trigger impulsive purchases. In online shopping environment, there is also a positive correlation between individual positive emotional response and impulse buying [37]. Accordingly, the following hypotheses are proposed:

H3: Time distortion has a positive impact on online impulsive buying.

Exploratory behavior can be divided into exploratory product acquisition and exploratory information search [38]. Exploratory product acquisition is an exploratory behavior to meet the needs of sensory stimulation. It usually has no purchase plan, hedonic browsing without time limit, and has more positive emotions and imagination about things. It is easier to trigger impulse buying under the stimulation of websites [39]. Exploratory information search is an exploratory behavior to meet the needs of cognitive stimulation. It usually pays more attention to product details and word of mouth. The consistency between cognition and word of mouth can positively affect positive emotions [40]. Studies also believe that it is easy to trigger the impulse to buy [33]. Exploratory behavior is manifested as more hedonic browsing and easier to make irrational purchase decisions [41]. Accordingly, the following hypotheses are proposed:

H4: Exploratory behavior has a positive impact on online impulsive buying.

Mitchell & Zwaan (2015) described compulsive buying as "irresistible and strong impulse to buy", which means that compulsive buying is an extreme form of impulsive buying, or impulse is an important predictor of compulsive buying [42]. Previous studies have shown that irrational buying can be divided into impulse buying and addictive buying, and the relationship between them can be regarded as a continuum. Impulsive buying is the initial stage, which gradually forms habits and repetitive behaviors and eventually evolves into addicts [43]. Darrat, Darrat, & Amyx (2016) have proved that there is a correlation between impulsive buying and compulsive buying [44]. On the one hand, impulsive buying increases consumers' anxiety, and the accumulation and intensification of anxiety will increase negative emotions, leading to the reduction of cognitive control ability and increasing the probability of shopping addiction. Clinically, impulse buyers and addicts share many of the same symptoms. Accordingly, the following hypotheses are proposed:

H5: Impulsive buying is positively correlated with online shopping addiction.

H6: Impulsive buying plays a mediating role in the presence of online shopping addiction.

H7: Impulsive buying plays a mediating role in concentration on online shopping addiction.

H8: Impulsive buying plays a mediating role in distorting the sense of time and online shopping addiction.

H9: Impulsive buying plays a mediating role between exploratory behavior and online shopping addiction.

Online shopping addiction is seen as a chronic, excessive and repetitive behavior, an uncontrollable obsession or a coping mechanism [45]. According to the theory of addiction, the final formation of addictive behavior is the result of the gradual accumulation of the consumption capital of addictive products. It is through the repeated and alternate selection process that consumers have special preferences for the products, and continuous consumption of addictive products to maintain the utility, which eventually leads to addiction. Players who play games frequently have a higher risk of addiction problems [46]. Behavior repetition is a prerequisite for game addiction [47], and there is a significant correlation between repetitive behavior and online game addiction [48]. Chaloupka (1990) studied cigarette addiction and believed that long-term heavy smoking behavior was the key factor leading to cigarette addiction [49]. Based on this, this paper theorizes that the level of repetition frequency affects the degree of online shopping addiction. That is to say, high-frequency impulsive buying behavior will lead to a deeper degree of online shopping addiction, while low-frequency impulsive buying behavior may only lead to a lower level of online shopping addiction. Accordingly, the following hypotheses are proposed:

H10: Behavior repetition plays a moderating role between impulsive buying and online shopping addiction.

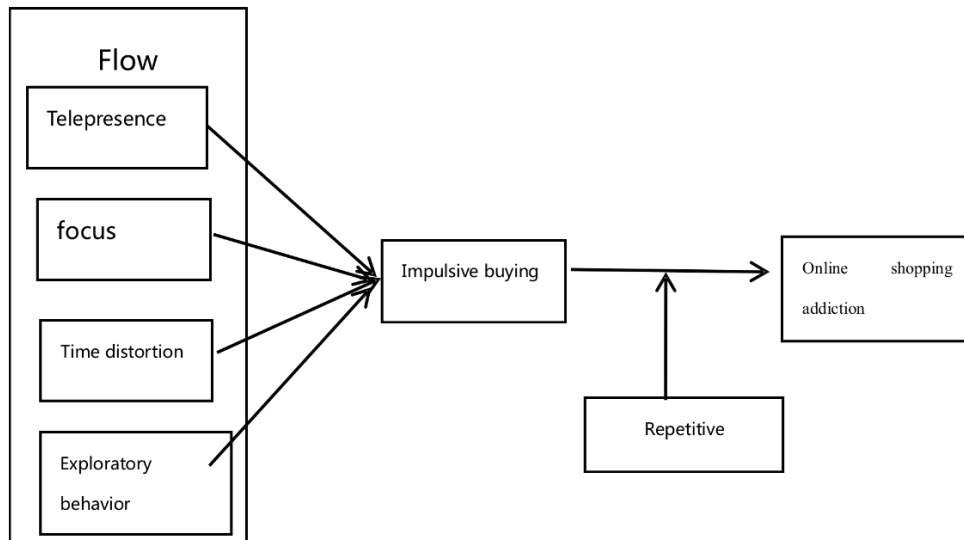


Figure 1. Conceptual model of influencing factors of online shopping addiction.

2.3. *Data source and analysis*

Based on the flow experience questionnaire of Novak et al. (2000) and the addiction questionnaire of Griffiths et al. (2015) and Chou & Ting (2003) [32, 50], this study distributed 600 questionnaires through the domestic network, not limited to specific groups, and 570 were collected. The recovery rate is 95%. Considering that many data of the consumer survey may not meet the requirements of normal distribution and scale interval, and the sample size may not meet the requirements of maximum likelihood estimation, and the current research theoretical system on online shopping addiction is not mature, Smart PLS software was used for data analysis.

2.3.1. Reliability and validity evaluation

Internal consistency was tested by Composite Reliability and Cronbach's Alpha(α) coefficient. In the exploratory study, Composite Reliability was required to be above 0.7. Cronbach's Alpha(α) coefficient should be greater than 0.6. As can be seen from Table 1, the Composite Reliability and Cronbach's Alpha(α) coefficient of all latent variables meet the requirements, which indicates that the measurement model has good reliability.

Table 1. Results of internal consistency test.

Vairables	Cronbach's Alpha	Composite reliability (CR)
Telepresence	0.845	0.895
Focus	0.855	0.902
A distorted sense of time	0.81	0.887
Exploratory behavior	0.795	0.88
Impulsive buying	0.876	0.924
Online shopping addiction	0.926	0.936

Generally speaking, latent variables can be reasonably explained only when Factor loading is greater than 0.5. Convergent validity and discriminant validity of PLS model require Average Variance Extracted (AVE) to be greater than 0.5. And the square root of AVE value is larger than the correlation coefficient of other latent variables. As can be seen from Table 2, the data in this study meet the above conditions, indicating that there is a good linear equivalence relationship between the measured variables and latent variables, and the measurement model has good discriminant validity.

Table 2. Correlation coefficient between AVE square root and latent variable.

	Focus	Telepresence	Impulsive buying	Distorted sense of time	Exploratory behavior	Online shopping addiction
Focus	0.83					
Telepresence	0.67	0.82				
Impulsive buying	0.50	0.42	0.90			
Distorted sense of time	0.59	0.49	0.56	0.85		
Exploratory behavior	0.52	0.52	0.29	0.38	0.84	
Online shopping addiction	0.61	0.58	0.71	0.63	0.43	0.73

Note: The value on the diagonal is the square root of AVE.

2.3.2. Main effect hypothesis test analysis

The test results show (Table 3) that the path coefficients of presence, concentration and distorted time perception on impulsive buying are 0.109, 0.219, 0.405 and 0.008, respectively. The t-test values are all greater than 1.96, and the P values are less than 0.05, which means that hypothesis 1, 2, 3 and 5 are valid. It indicates that presence, concentration and distorted time perception have significant positive effects on impulsive buying. The path coefficient of exploratory behavior on impulsive buying is 0.008, $T=0.15 < 1.96$, $P > 0.05$, the confidence interval contains 0, the hypothesis is not valid, indicating that there is no necessary relationship between exploratory behavior and impulsive buying. The test path coefficient of impulsive purchase is 0.709, and both T value and P value meet the significance requirement, indicating that impulsive purchase has a significant positive impact on online shopping addiction.

Table 3. Test results of main effect.

Hypothesized path	Path coefficient	T value	P value	Confidence interval		Results
				5%	95%	
H1: Telepresence → Impulsive buying	0.109	1.87	0.03	0.01	0.20	Supportive
H2: Focus → Impulsive buying	0.219	3.30	0	0.10	0.33	Supportive
H3: Distorted sense of time → Impulsive buying	0.405	8.10	0	0.32	0.49	Supportive
H4: Exploratory behavior → Impulsive buying	0.008	0.15	0.44	-0.09	0.10	Unsupportive
H5: Impulsive buying → Online shopping addiction	0.709	29.81	0		0.67	0.75

2.3.3. Mediating effect hypothesis test analysis

The mediating effect results (see Table 4) show that the indirect effect of presence, distorted sense of time and focus on online shopping addiction through impulsive buying is $P < 0.01$, and the 95% confidence interval does not include 0 value, indicating that the mediating effect of impulsive buying on the relationship between presence, distorted sense of time and focus on online shopping addiction is established. However, the mediating effect of impulsive buying on the relationship between exploratory behavior and online shopping addiction is not established. From the analysis of the total benefit path coefficient, the total effect path coefficient of presence, concentration and distorted time on online shopping addiction is equal to the mediating benefit path coefficient, indicating that impulsive buying plays a full mediating role in the relationship between presence, concentration and distorted time on online shopping addiction.

Table 4. Test results of mediating effect.

Mediation path	Mediation path coefficient	T value	P value	Confidence interval		Results
				5%	95%	
H6: Telepresence → Impulsive buying → Online shopping addiction	0.077	1.855	0.032	0.008	0.145	Supportive
H7: Focus → Impulsive buying → Online shopping addiction	0.155	3.252	0.001	0.074	0.232	Supportive
H8: Distorted sense of time → Impulsive buying → Online shopping addiction	0.287	7.499	0	0.224	0.35	Supportive
H9: Exploratory behavior → Impulsive buying → Online shopping addiction	0.006	0.146	0.442	-0.06	0.071	Unsupportive

2.3.4. Test results of moderating effect

The results show (Table 5) that impulsive buying has a significant positive impact on online shopping addiction (path coefficient: 0.705; $T = 29.552 > 1.96$; $P < 0.001$); The interaction coefficient between impulsive buying and repetitive behavior is positive, which passes the significance test and is significant at the 0.001 level. The above tests do not contain a value of 0 at 95% confidence intervals. These results indicate that repetitive behavior has a positive moderating effect on the relationship between impulsive buying and online shopping addiction.

Table 5. Test results of moderating effect.

Path	Path coefficient	T value	P value	Confidence interval		Results
				5%	95%	
Impulsive buying → Online shopping addiction	0.705	29.552	0	0.666	0.744	Supportive
Repetitive behavior → Online shopping addiction	0.088	2.683	0.004	0.034	0.141	Supportive
Repetitive behavior × Impulsive buying → Online shopping addiction	0.141	4.186	0	0.089	0.199	Supportive

4. Research conclusions and prospects

4.1. Research conclusions

a. The flow experience dimension of presence, concentration and time distortion has a significant positive impact on impulsive buying, indicating that enhancing consumers' immersive presence feeling, concentration and time distortion can improve consumers' impulsive buying. From the perspective of path coefficient, the distorted sense of time has the largest impact on impulsive buying, followed by concentration and presence, indicating that the distorted sense of time has a more immersive flow state than concentration and presence. Exploratory behavior has no significant effect on impulse buying, and the path coefficient is negative, which indicates that exploratory behavior can enhance consumers' ability to learn and actively acquire product information in the process of browsing, and conversely improve consumers' rational thinking, thus inhibiting impulsive buying.

b. Impulse buying has a significant positive effect on online shopping addiction, indicating that impulsive buying is the lead variable of online shopping addiction. The result of impulse buying may be negative emotions such as guilt and self-blame, and the repeated accumulation of such negative emotions can evolve into purchase addiction. Impulsive buying plays a complete mediating role in the relationship between presence, distorted sense of time, and concentration on online shopping addiction, indicating that impulse and impulse buying behaviors generated under flow experience do not directly affect addiction, but need to play an indirect role through impulsive buying.

c. Behavior repetition plays a moderating role between impulsive buying and online shopping addiction. It shows that consumers can reduce the degree of online shopping addiction by reducing the purchase frequency. In order to avoid irrational purchases, you can interrupt the flow state by setting a certain time reminder for Internet browsing. At the same time, after the occurrence of impulsive buying, the regret mechanism can be activated in

time, or by controlling themselves for a period of time not to buy online, to avoid repetitive impulse buying and avoid falling into online shopping addiction.

4.2. The prospect

The existing research on shopping addiction is more in developed countries, but the research on developing and emerging countries is obviously insufficient. In recent years, Chinese Internet shopping has witnessed explosive growth. Impulse buying has become a common phenomenon among consumers. Shopping addiction is showing a spreading trend. Therefore, it is necessary to study irrational online shopping behavior from multiple angles. In the future, it is necessary to conduct further research on online shopping addiction from the following three aspects: first, the emergence and development mechanism of online shopping addiction based on irrationality. The second is to prevent and treat online shopping addiction; The third is to provide institutional guarantee for irrational purchase behavior. The research can help consumers avoid the irrational purchase trap. On the other hand, it can also provide a theoretical basis for government decision-making.

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The authors declare no conflict of interest.

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