

Degree of Financial Support, Degree of Optimization of Financial Structure and Level of Industrial Financial Development

-- A Group Analysis based on the CIFDI Indicator Evaluation System

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Abstract

In recent years, China's economy has seen the phenomenon of "de-realization to virtualization", the virtual economy overpowers the real economy, and the financial self-circulation self-service, and the relevant departments have held a number of relevant meetings to emphasize the financial "de-realization to realization" and improve the quality and efficiency of financial services to the real economy. There is a lack of in-depth research on the conditions and mechanisms for the formation of differences in the level of industrial financial development. Based on the China Industrial Finance Development Index and its first-level index data compiled by the China Academy of Comprehensive Development, this paper uses fs/QCA to analyze the grouping of cases of industrial finance development of 31 provincial administrative regions in China in 2018 and 2019, and to explore the path of realizing the high level of industrial finance development in the region. The research of this paper helps to provide certain ideas for local governments to formulate relevant industrial financial development policies according to local conditions and endowments, and to go out of the road of high industrial financial development level with local characteristics.

Keywords

Industrial Finance; Driving Path; fsQCA; Financial Deconcentration.

1. Introduction

On the afternoon of February 22, 2019, Xi Jinping, General Secretary of the Communist Party of China Central Committee, presided over the thirteenth collective study on "perfecting financial services and preventing financial risks", pointing out that "the economy is the muscle, the financial system is the blood, and the two are symbiotic and co-prosperous", and emphasizing the enhancement of the ability of financial services to serve the real economy, and promoting the healthy development of China's financial industry. The ability of financial services to the real economy, and promote the healthy development of China's financial industry ; in October 2023, the Central Financial Work Conference pointed out that there are still problems such as the quality and efficiency of financial services to the real economy, and that we should focus on building a modern financial institutions and market system, and dredge up the channels through which capital enters the real economy . The real economy is the foundation of finance, and serving the real economy is the vocation of the financial industry. Zhang Xiaojing pointed out in "not only to curb the real to virtual, but also to follow the financial laws", in recent years, China's economy has appeared "real to virtual", the virtual economy over the real economy, the phenomenon of financial self-circulation of self-service , analyzed the reasons and put forward the corresponding measures. In the financial system is still not sound, the efficiency of the real economy is not enough to serve the current situation, the study of China's industrial finance

development status quo, the impact of financial services on the efficiency of the real economy of the relevant indicators to analyze and formulate matching financial "off the virtual to the real" measures is extremely important. Around this topic, relevant scholars have also done a lot of useful exploration, but most of the research is more concerned about the impact of financial services on the efficiency of the real economy to carry out independent analysis of the factors affecting the efficiency of the real economy, and did not systematically reveal the complex operation mechanism of multi-factor interaction. In the process of regional practice, due to the neglect of the linkage between the four first-level indicators, the practice situation can not reflect the optimal effect on the overall level of industrial financial services development, so that the efficiency of reform measures in promoting the financial "de-virtualization to the real" can not reach the optimal level of practice, and the sustained impetus for reform is insufficient. The "group perspective" has been widely used to explore the causal complexity of organizational outcomes (Fiss, 2011; Du Yunzhou and Jia Liangding, 2017). The perspective can achieve the common purpose of influencing organizational outcomes by differentially arranging and combining interdependent multiple influences. China's Industrial Finance Development Index (CIFDI), compiled by China (Shenzhen) Comprehensive Development Research Institute, evaluates and dynamically analyzes the relevant indicators of the country and 31 provincial autonomous regions in terms of four dimensions, namely, financial support, structural optimization, service effectiveness and financial security. The CIFDI evaluates and dynamically analyzes the relevant indicators of the country and 31 provincial autonomous regions in four dimensions: financial support, structural optimization, service effectiveness and financial security. Based on this, this paper will take the comprehensive evaluation scores of CIFDI and its four primary indicators of 31 provincial-level autonomous regions of China in 2018 and 2019 as the basis, and explore what are the conditions affecting the performance of local financial services for the real economy from the perspective of "grouping perspective". Which conditions play a more important role? What kind of matching and substitution relationship exists between them? Based on the evaluation system of CIFDI indicators, this paper tries to reveal the conditions and mechanisms that lead to the differences in the level of industrial financial development of provincial administrative regions through Fuzzy set Qualitative Comparative Analysis (Fuzzy set Qualitative Comparative Analysis), beyond the specificity of individual cases. On this basis, through exploring the synergistic effect of multiple conditions in the evaluation system of CFIDI indicators, we will elaborate the complex interactive nature of the multiple conditions behind the development of industrial finance in each provincial administrative region, so as to provide new ideas for governmental organizations and other organizations to formulate and implement measures related to the promotion of "financial services for the real economy".

2. Literature Review

2.1. Practical Experience and Research Progress

Financial detachment from the real economy will cause excessive expansion of the virtual economy, damage to the development of the real economy, the accumulation of financial risks, and ultimately lead to a financial crisis, which will deal a great blow to the operation of society and economic development. In recent years, financial detachment from the real and financial services to the real economy has been increasingly concerned by domestic and foreign experts and scholars. Foreign scholars pay more attention to the empirical analysis of the exploration of the factors affecting the financial promotion of the real economy and the study of its importance. Khatun, R. (2016) conducted Pedroni panel by analyzing the data on financial services trade and economic growth rates of each country in the BRICS countries (Brazil, Russia, India, China, South Africa) for the period of 1990-2012 with cointegration analysis and causality

analysis, cointegration analysis and causality analysis, and found that there is a short-term and long-term univariate causality between financial services trade and the economic growth rate of the BRICS countries; Sadalia, I. et al. (2019) conducted an in-depth study on the relationship between economic growth and trade openness from the actual situation, analyzed the relationship between the two from the theoretical level, and concluded that the liberalization of the financial system is a major factor in promoting the economic growth of ASEAN countries; and so on.

Domestic scholars tend to define the definition of industrial finance, explore its influencing factors based on different perspectives and illustrate the real problems it faces in China's practice. Ji Min and Liu Hong (2000) define industrial finance as a general term for financial activities relying on and promoting the development of specific industries, revealing the significance of industrial finance to the optimization of industrial structure. Domestic scholars have conducted extensive research on the influencing factors of the efficiency of financial services to the real economy: Conceptual level research: Li Yang (2017) believes that the fundamental requirement for finance to serve the real economy is to effectively play its function of mediating the allocation of resources and reducing the cost of circulation, and that improving the intermediary efficiency and allocative efficiency of finance can provide better financial services to the real economy. Theoretical and practical two-level research: Zhang Xiaopu and Zhu Taihui (2014) believe that the financial system as part of the service industry and the core of resource allocation in the real economy, directly contributing to the output of the real economy. Xue Ying and Hu Jian (2020) believe that fintech can promote high-quality and sustainable development of the economy by enhancing the ability of traditional financial business to serve the real economy and boosting the asset management business from virtual to real. Empirical level research: Cai Zexiang and Wu Xueqiang (2017) empirically analyzed the panel data of 31 provinces in China from 2008 to 2015 after processing with SBM directional distance function and Luenberger index method respectively, and argued that the degree of financial decentralization of the government, the degree of concentration of the bank, the proportion of direct financing, the proportion of equity financing and the inclusive financial development index are the main factors affecting the efficiency of financial services to the real economy. For technical efficiency and scale efficiency: Tan Zhongming et al (2015) establish the index evaluation system of the development efficiency of financial services strategic emerging industries from the perspective of input-output and carry out empirical analysis with DEA method and logistic regression model, and consider that **the technical efficiency and scale efficiency of the industry** are the important factors influencing the efficiency of financial support for the development of strategic emerging industries. Zhang Lin and Zhang Weikang (2017) measured the efficiency of financial services real economic growth and its changes in 31 provinces and cities in China from 1999 to 2015 with DEA-based global Malmquist index and Malmquist index in the same period and analyzed it empirically, and concluded that the main factors affecting the efficiency of financial services real economic growth were **efficiency changes and technical progress and dominated by technical efficiency**. Relatedly, You Soldier and Yang Fang (2019) argued that the improvement of the efficiency of the green development of financial services real economy is mainly driven by **scale efficiency**. Ba Shusong et al (2021) found that the financial reform of China's free trade zones has a significant and sustained effect on the improvement of the efficiency of the financial services real economy. In addition, domestic scholars are more concerned about **the real problems faced by China's financial services real economy**: Wang Zhuchuan et al (2019) believe that China's capital mismatch due to the shortcomings of the traditional analytical system has led to the emergence of the problems of "financing difficulties of the real enterprises, financing is expensive" and "financialization of the real enterprises" in recent years. and "financialization of real enterprises" and other problems. Lin Yifu et al. (2019) suggest that structural contradiction is

the fundamental problem of China's financial system. Song Fangxiu (2023) pointed out that in the new era, China's financial service to the real economy still has problems such as imperfect fund supply system, unbalanced fund allocation, and difficulties in financing small and medium-sized enterprises (SMEs), and proposed that it is necessary to continue to push forward the reform of the supply side of the financial system and to strengthen financial supervision.

The above research provides empirical references and theoretical basis for the formulation and implementation of relevant policies to further promote the efficiency of financial services in China's real economy. However, the existing empirical research mainly focuses on the single value of many elements to analyze and put forward relevant policy recommendations, neglecting the integration analysis of influencing factors and the systematic exploration of synergistic effects between multiple conditions. The conditions and mechanisms for the functioning of the indicators of the evaluation system of the efficiency of financial services for the real economy based on China's actual situation need to be further clarified and more convincing explanations need to be provided.

3. Research Methodology and Data

3.1. Qualitative Comparative Analysis

This paper tries to analyze the multivariate driving mechanism behind the level of industrial financial development from the perspective of grouping, so it adopts fs/QCA to carry out empirical tests. qCA method was firstly proposed by Rain (1987) in the 1980s, the researcher can compare the conditions and results between cases, and draw the matching relationship between different conditions and the logic between results, as well as to investigate the question of "which condition variable grouping can lead to the emergence of the outcome variable and which will lead to its disappearance", i.e., to study the synergistic effect of multiple conditions of the outcome variable on the basis of causal complexity (Du Yunzhou and Jia Liangding, 2017). Distinguished from the quantitative research mainly based on regression analysis and qualitative research mainly based on case analysis, QCA method can meet the researcher's ability to identify the mechanism of the role of the conditional variables while realizing the degree of external generalization of the empirical results to a certain extent through the cross-case comparison of the case samples. Secondly, QCA can find condition groupings with equivalent results, which can help researchers understand the mechanism of differences in results under different cases and different combinations of variable conditions, and help explore the collocation and substitution relationship between condition variables under the grouping of equivalent results, as well as explore the mechanism of inter-conditional effects within the grouping. In recent years QCA research methods have been increasingly utilized in many disciplines such as political science, sociology, and management. Qualitative analysis comparison includes clear set qualitative comparative analysis (cs/QCA), fuzzy set qualitative comparative analysis (fs/QCA) and multi-valued set qualitative comparative analysis (mv/QCA); compared with cs/QCA and mv/QCA, fs/QCA can also deal with the degree change or partial affiliation problem in addition to the category problem (Du Yunzhou and Jia Liangding, 2017) so it is in recent years has been widely used and empirical research. In this paper, we also use fuzzy set qualitative comparative analysis (fs/QCA) to analyze the matching and substitution relationship between each level of indicators of CIFDI in each province under the results of equivalent industrial finance comprehensive evaluation score.

3.2. Data and Calibration

3.2.1. Outcome and Condition Variables

The outcome of concern in this paper is the level of financial services to the real economy. Industrial finance as a general term for financial activities relying on and promoting the

development of specific industries (Ji Min and Liu Hong, 2000), China (Shenzhen) Comprehensive Development Research Institute research compiled the China Industrial Finance Development Index (CIFDI) from four dimensions, the use of 38 indicators to comprehensively evaluate the performance of financial services real economy in China and the 31 provincial administrative regions. Based on this, this paper selects the 2018 and 2019 CIFDI of China's 31 provincial administrative regions published by the China (Shenzhen) Institute of Comprehensive Development Research as the outcome variable, and uses the four first-level indicators of the 2018 and 2019 CIFDI evaluation system of China's 31 provincial administrative regions: the degree of financial support (FS), the degree of structural optimization (SOD), the degree of service effectiveness (SE), and the degree of financial security (FSD). Degree (FSD) as conditional variables for processing analysis.

3.2.2. Calibration

Before analyzing the data it is necessary to first determine the calibration anchors for each variable in order to calibrate each variable for processing. To adjust the raw data of the selected cases were assigned fuzzy set set affiliation scores to reflect the degree of affiliation of the different condition variables and outcome variable indicators in the set for each case. The quartile value used for calibration is between 0-1, the larger the value indicates the higher the degree of affiliation, in this paper, we adopt the direct calibration method, and select the three anchor points of 95% (full affiliation point) and 5% (full non-affiliation point) quartile (Andrews et al.,2016) and 50% quartile (intersection point) of the sample data to calibrate the data. The variable calibration results are shown in Table 1.

Table 1. Variable calibration anchors

variant	Full affiliation 95%	50% of intersections	Completely unaffiliated 5%
Industrial Finance Development Index (IFDI)	70.2585	49.1	35.5395
Level of financial support (FS)	20.969	15.725	8.6215
Structural optimization degree (SOD)	16.3505	9.01	5.652
Service Effectiveness (SE)	16.007	9.885	7.686
Financial Security Degree (FSD)	15.9355	13.5	9.993

Data source: Excel processing results.

After obtaining the thresholds of each variable, the selected raw data were imported in fsQCA 3.0 software and the values of each variable were calibrated and processed into a fuzzy set manifold with degrees of affiliation using the Calibrate function for subsequent analysis.

4. Data analysis and Empirical Results

4.1. Necessity Analysis of Single Influencing Factor and Construction of Truth Table

4.1.1. Analysis of the Need for a Single Influencing Factor

According to the fs/QCA analysis steps, the necessity analysis of individual condition variables is conducted before forming the fuzzy set truth table of factors influencing the industrial financial development index and conducting the grouping analysis to determine whether the independent antecedent variables are the necessary conditions that have a significant facilitating or inhibiting effect on the performance of the firms.

Table 2. Results of the analysis of the necessity of individual conditions of the industrial finance development index

antecedent variable		High Industrial Financial Development Index (IFDI)		Low Industrial Financial Development Index (~IFDI)	
		Consistency	Coverage	Consistency	Coverage
Degree of financial support	FS	0.936491	0.882023	0.517612	0.573034
	~FS	0.546667	0.490863	0.893433	0.942974
Structural optimization	SOD	0.884561	0.879010	0.484776	0.566248
	~SOD	0.563509	0.481993	0.896418	0.901260
Service Effectiveness	SE	0.905263	0.834142	0.526567	0.570320
	~SE	0.533684	0.489540	0.846865	0.913099
Financial security	FSD	0.851930	0.773741	0.587164	0.626832
	~FSD	0.589123	0.548334	0.788060	0.862181

Note: "~" indicates the inverse meaning of the condition; data source: fsQCA3.0 processing results.

Only when the consistency of a single influence factor is greater than or equal to 0.9, the variable is considered to have the possibility of being a necessity condition for that outcome variable (Schneir, 2012), and further necessity tests were conducted for the positive implication indicator of financial support (FS) and the positive implication indicator of service effectiveness (SE) with consistency levels greater than 0.9. As shown in Fig. 1 and Fig. 2 two variables consistency scatter plot diagram 1 Necessity test of financial support degree Fig. 2 Necessity test of service effectiveness The results do not satisfy that more than 1/3 of the points fall above the diagonal as shown above, indicating that there is no necessity condition, and there is no concentration on the right side of the scatter plot, indicating that the selected variables do not contain "irrelevant necessity conditions". In summary, as seen in Table 2, among all the antecedent variables studied in this paper, the strongest explanation of the necessity of generating high industrial financial development index is the degree of financial support (FS) whose consistency result is 0.936491, and there is no necessary condition in the conditional variables that individually makes the local industrial financial development produce high or low level, so on this basis, we will carry out the joint effect of the condition group state of the high level of industrial financial development of the provincial administrative regions. The joint effect of conditional grouping.



Figure 1. Necessity test for financial support **Figure 2.** Service Effectiveness Necessity Test

4.1.2. Construction of the Truth Table for the Combination of Influencing Factors

Using fsQCA3.0 to construct the truth table by setting the thresholds of minimum number of cases, consistency and PRI, the standardized analysis was conducted to derive the results of conditional grouping. In this paper, the selected data belongs to small samples, and 1 is selected

as the case frequency threshold; when adjusting the truth table, the consistency (raw consist) is based on the natural truncation recognized by the software as 0.9 as the threshold, and with the help of PRI consistency (PRI consist) to further reduce the possibility of the result of "the grouping that leads to high industrial financial development index becomes a subset of the grouping that leads to low index", and the PRI threshold is set as the threshold. " possibility, set the PRI threshold value of 0.75 (Du Yunzhou, Jia Liangding, 2017; Zhu Yali et al., 2020) to adjust, screen out the sample of the grouping condition that finally makes the comprehensive evaluation of the industrial financial development index of the provincial administrative regions IFDI = 1, and form the truth table.

4.2. Analysis of Grouping Results of Factors Influencing the Development of Industrial Finance

From the aforementioned results of the necessity analysis of single influencing factors, it can be seen that there is no independent antecedent conditions that can make its provincial industrial financial development show a high index, and then the case samples are standardized to analyze the combination of conditions in order to obtain the sufficient condition group state that makes the provincial administrative regions' industrial financial development index show a high level. The fsQCA3.0 software is used to analyze the truth table obtained above, and three kinds of histogram solutions are obtained: complex solution, simple solution and intermediate solution. The complex solution, also known as the conservative solution, is the solution formed only for the case without incorporating the logical residuals; the parsimonious solution is the solution formed by incorporating all the logical residuals; and the intermediate solution embodies the logical residuals that are in line with the theory and the reality, i.e., a combination of the conditions that are in line with the theory and the logic at the same time. The complex solution, parsimonious solution and intermediate solution derived from the analysis of this paper are all the same, indicating that the selected cases in this paper cover all possibilities, so we no longer distinguish between the core and auxiliary conditions, and obtain the configuration of the grouping scheme for the first-level index of high scores in the comprehensive evaluation of the industrial financial development index of the three provincial-level administrative regions Solid circle (●) represents the conditions of the grouping composition, indicating that the existence of the positive meaning of the condition will have an effect on the results, and the blank section indicates that the presence or absence of the condition will not have an impact on the outcome of the combination. The three grouping scheme configurations are shown in the table below.

Table 3. Group configuration of high industrial financial development index in provincial administrative regions

Conditional Configuration	Configuration 1 Structure - service-oriented	Configuration 2 Structural-safety type	Configuration 3 Service-Safe
Level of financial support (FS)	●	●	●
Structural optimization degree (SOD)	●	●	
Service Effectiveness (SE)	●		●
Financial Security Degree (FSD)		●	●
Consistency	0.986193	0.992192	0.986372
Raw Coverage	0.774313	0.713269	0.736388
Unique Coverage	0.114054	0.0530101	0.0761296
Solution Consistency	0.973574		
Solution Coverage	0.903452		

Data source: fsQCA3.0 processing results.

From the results of the overall analysis, the consistency of the solution in the whole of the 61 samples of 31 provincial administrative regions in 2018 and 2019 is 0.973574, and the consistency of the individual grouping states is 0.986193, 0.992192 and 0.986372 in turn, which is much larger than the critical value of the level of the sufficient conditional consistency of 0.8; and the coverage of the overall solution amounts to 0.903452, that is, the overall grouping results can explain more than 90.34% of the cases of high industrial financial development index in provincial administrative regions. Therefore, it is considered that the results of this fs/QCA standardized analysis are valid and the strength of the sufficient condition explanation is high. From the results of group-state configuration, higher financial support exists in all three group-states.

Specifically: the original coverage of group configuration 1 (FS*SOD*SE) is 0.774313, which means that this group can explain about 77.43% of the high industrial finance development index of each provincial administrative region in the past years; the unique coverage is 0.114054, which means that about 11.41% of the high industrial finance development index of the provincial administrative regions can be represented by this group only, and the result of group configuration 1 shows that if a province with a high degree of financial support can ensure that the degree of structural optimization and the degree of service effectiveness are both kept at a high level on this basis, it can achieve a high development index of industrial finance in the province, and the driving path is named as "structure-service type".

The original coverage of group configuration 2 (FS*SOD*FSD) is 0.736388, which means that this group configuration can explain about 73.64% of the high industrial finance development index of each provincial administrative region over the years; the unique coverage is 0.0530101, which means that about 5.30% of the high industrial finance development index of the provincial administrative regions can be represented by this group configuration only, and the result of group configuration 2 shows that provinces with a high degree of financial support can achieve high industrial finance development index if they can ensure that the degree of structural optimization and the degree of financial security are kept at a high level on this basis, and this driving path is named "structure-security type".

The original coverage of group configuration 3 (FS*SE*FSD) is 0.713269, which means that this group can explain about 71.33% of the high industrial finance development index of each provincial administrative region in the past years; the unique coverage is 0.0761296, which means that about 7.61% of the high industrial finance development index of the provincial administrative regions can be represented by this group only, and the result of group configuration 3 shows that the provinces with high financial support degree can also realize the high development index of the province's industrial finance if they can ensure the service effectiveness and financial security degree are both maintained at a higher level on this basis. The result of group configuration III shows that provinces with high degree of financial support can also realize the high development index of industrial finance if they can ensure that the degree of service effectiveness and the degree of financial security are kept at a high level on this basis, and the driving path is named as "service-security type".

The case point data displayed by fsQCA3.0 consists of group state affiliation and result affiliation. In this paper, we select the case points whose group state affiliation is greater than 0.501 and the result affiliation is greater than or equal to the group state affiliation in the group state cases recognized by fsQCA3.0 to draw a scatter plot of the explained cases, and the following Figures 3-Figure 5 show the explained cases corresponding to the three types of conditional group states. Figures 3-5 below show the explanation cases corresponding to the three types of conditional groupings. The label "" after the name of the provincial

administrative region indicates that the data point is the relevant data of the province in 2018, and the label not added indicates that the point represents the data of the province in 2019.

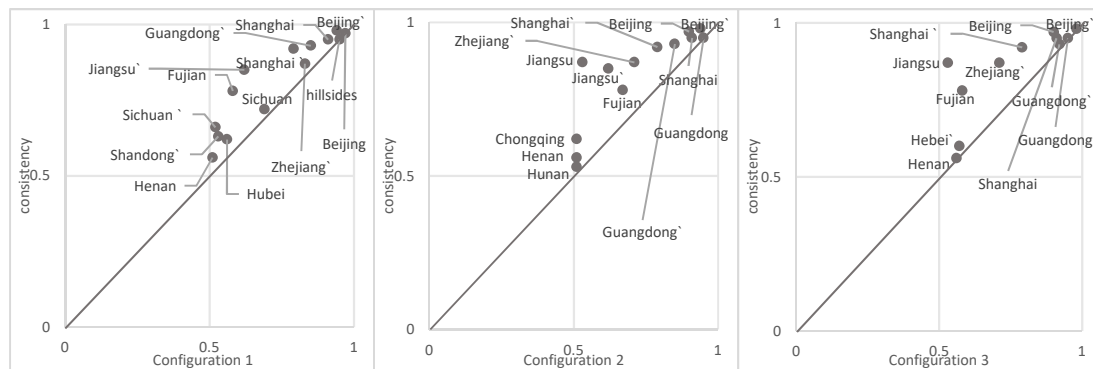


Figure 3. Explanation case for condition configuration 1,2,3

Conditional configuration 1 "structural-service-oriented" grouping can explain the case of China's major financial centers and the three stock exchanges in mainland China: Beijing, Shanghai, Guangdong 2018 and 2019 data, Sichuan Province 2018 and 2019 data are also listed, and the path of formation of high financial development indicators in Jiangsu 2018, Zhejiang 2018, Shandong 2018, Fujian 2019 and Hubei and Henan provinces in central China is also more consistent with the grouping 1 "structural-service-oriented" grouping. And east China's Jiangsu 2018, Zhejiang 2018, Shandong 2018, Fujian 2019 and central China's Hubei and Henan provinces 2019 high financial development indicators formation path is also more consistent with the role of the mechanism of group state 1, as one of the typical cases of zhejiang province, and took the lead in the introduction of the implementation rules for the evaluation of the performance of green credit, and took the lead in the release of the green enterprise, green bank recognition and evaluation, etc. ideological standards, and its green loan balance and green bond balance have grown significantly since the establishment of the pilot zone. In addition Zhejiang has a clear advantage in the scale of the total market capitalization of domestic listed companies in 2018 as a proportion of its own GDP, and the province has a high degree of effective financial services, coupled with its higher level of financial support, which makes its industrial financial development index reach a high level.

Cases explained by Conditional Configuration 2 "Structural-Safety" except for two consecutive years of data from the first echelon of financial development, Beijing, Shanghai and Guangdong in 2018 and 2019, East China Jiangsu Province in the region has also been selected as a case for two consecutive years, in addition to the data of Zhejiang in 2018 and Fujian in 2019 in East China, the data of Chongqing in 2019 in Southwest China, and the path of realizing the high-industry financial index of Henan and Hunan in Central China in 2019 can also be interpreted by the configuration 2 "structural-security type". -security type" explanation. Among them, Chongqing in 2019 benefited from the previous policy of supporting the development of Internet microfinance companies, microfinance company development advantage since 2018 is particularly prominent, in 2019, the municipality continued to deepen the financial supply side reform, the Shenzhen Stock Exchange and the local co-built capital market service base is also settled in Chongqing, the annual incremental increase in the size of the social financing of 596.96 billion yuan, the credit financing accounted for nearly 80%, and the growth rate of all loans was also higher than the national level, the degree of structural optimization has been significantly improved; at the same time, Chongqing has paid attention to the prevention of risks in key areas, written off about 15.6 billion yuan of non-performing loans in the whole year, and legally acquired a large amount of bonds of the Baoshang Bank under the jurisdiction of the country, set up a daily detection mechanism for bond repurchase leverage, and further

improved the dynamic early warning mechanism of the risk of the inter-bank bond market. Financial security is at a high level in China . On the basis of more adequate capital, Chongqing Municipality's higher degree of financial structure optimization and higher degree of financial security in 2019 put its industrial financial development at a higher level.

The cases that can be explained by the conditional configuration 3 "Service-Security" also include the data of the first echelon of financial development in Beijing, Shanghai and Guangdong for two consecutive years in 2018 and 2019, in addition, the data of Zhejiang in East China for 2018 and Fujian for 2019.

Figure 3 Conditional configuration 3 interpretation case Henan Province in Central China in 2019 and Hebei Province in North China in 2018 data can also be interpreted by the configuration 3 "service-security type" configuration. Jiangsu is leading in the number of new IPOs in 2019, the total market capitalization of domestic listed companies accounts for the proportion of its own GDP, the premium income is higher, the degree of effectiveness of financial services is higher, and its degree of financial security was listed in the top five in 2018 along with Tibet, Beijing, Guangdong and Shanghai , which maintains a higher level, and its degree of effectiveness and financial security of financial services, which is more impressive based on the degree of support from the sufficient funds in 2019, makes it reach a high level of industrial financial development indicators. industrial financial development indicators to a high level.

4.3. Substitution Effects between Conditions

Through the comparison of the similarities and differences of condition configuration 1 to 3, we can further identify the potential substitution relationship between structure optimization degree, service effectiveness degree and financial security degree in evaluating the industrial finance development level of 31 provincial administrative regions. First of all, by comparing condition configuration 1 and condition 2, it can be found that for provinces with higher financial support, service effectiveness and financial security have a certain substitution relationship when they have higher structural optimization degree at the same time, as shown in Figure 4. Then, the comparison of condition configuration 1 and configuration 3 shows that for provinces with higher financial support, higher structural optimization degree and higher financial security degree can replace each other when they have higher service effectiveness at the same time, as shown in Figure 5. Finally, comparing condition configuration 2 and 3, it can be seen that for provinces with higher financial support, there is a certain substitution effect between structure optimization degree and service effectiveness when they have higher financial security degree at the same time, as shown in Figure 6. The above substitution relationship shows that in provincial administrative regions with higher support rate of funds, as long as at least any two of the three indicators of structural optimization, service effectiveness and financial security reach a higher level at the same time, a higher level of industrial financial development can be achieved. Among them, it can be clearly seen that the degree of capital support is more important under any conditions, and this finding can be related to the importance of capital to the development of the financial industry in the actual financial reform.

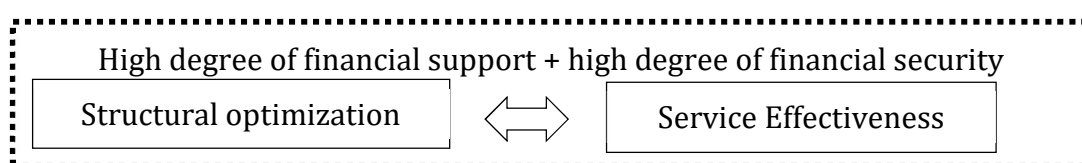


Figure 4. Substitution between efficiency gains in financial services and stronger financial regulation

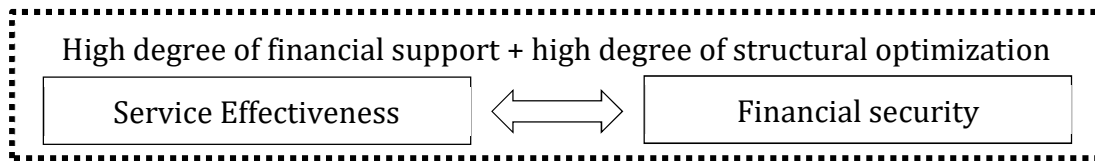


Figure 5. Alternative relationship between financial structural reforms and stronger financial regulation

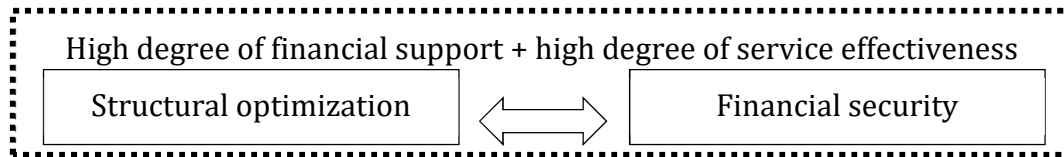


Figure 6. Substitution between financial structural reforms and efficiency gains in financial services

4.4. Robustness Test for Grouping of Indicators of High Industrial Financial Development Level

In order to make the results of the sufficiency condition study applying the fs/QCA method more convincing and reduce its randomness and sensitivity, the robustness of the resulting histograms is now tested. In this paper, we adopt the common method of set theory to test the robustness of the above adequacy results by adjusting the consistency threshold and adjusting the calibration threshold (Zhang, M., and Du, Yunchou, 2019), adjusting the consistency threshold, i.e., increasing the consistency threshold from the default of 0.8 to 0.85 under the premise of other conditions remaining unchanged (Zhang, M. et al., 2020); adjusting the calibration threshold, i.e., keeping the other conditions unchanged, the The anchors of the initial thresholds of each variable: 0.95 (full affiliation point), 0.5 (cross-affiliation point), 0.05 (completely unaffiliated point), were adjusted to 0.75, 0.5, 0.25, respectively, to obtain the results of the group configuration after adjusting the calibration anchors and after adjusting the calibration anchors, which are as follows in Table 4.

Table 4. The group configuration of the high industrial financial development index of provincial administrative regions obtained from the robustness test

Adjustment of the conformance threshold condition configuration	W1 = configuration 1	W2 = configuration 2	W3 = configuration 3
Consistency	0.986193	0.992192	0.986372
Raw Coverage	0.774313	0.713269	0.736388
Unique Coverage	0.114054	0.0530101	0.0761296
Solution Consistency	0.973574		
Solution Coverage	0.903452		
Adjusting the Calibration Anchor Condition Configuration	W4 = Configuration 1	W5 = configuration 2	W6 = configuration 3
Consistency	0.988989	0.994725	0.986597
Raw Coverage	0.638202	0.548091	0.546799
Unique Coverage	0.174407	0.0842969	0.083005
Solution Consistency	0.978807		
Solution Coverage	0.805504		

Data source: fsQCA3.0 processing results.

The above two robustness analysis methods yielded the results of the histograms whose respective complex, intermediate and simple solutions are identical, proving that none of them has logical residual terms. The configurations of the group states obtained from the two tests are the same as the original group state configuration, indicating that the results of this paper have good robustness.

5. Conclusion and Outlook

5.1. Findings

In recent years, China's economy has seen the virtual economy overpowering the real economy, financial self-service phenomenon of self-circulation, financial "off the virtual to the real" is imperative, and should not be delayed. The development of industrial finance has been widely concerned in recent years, the real economy is the foundation of finance, and serving the real economy is the vocation of the financial industry. On the level of industrial financial development and other related indicators of the factors affecting the investigation is mainly focused on the analysis of individual indicators, and there are few investigations on the multiple conditions affecting the development of industrial finance behind the complex interaction mechanism. Based on this, this paper takes the industrial financial development of 31 provincial administrative regions in China in 2018 and 2019 as a case study, and uses fs/QCA to conduct conditional grouping analysis to explore the driving paths of the evaluation system of this indicator in each provincial administrative region: the degree of financial support, the degree of structural optimization, the degree of effective service, and the degree of financial security affecting the comprehensive score of industrial financial development in each provincial administrative region. The study finds that, firstly, the degree of financial support, structural optimization, service effectiveness and financial security cannot constitute the necessary conditions for high-level industrial financial development alone. Driving paths that can realize high-level industrial financial development: 3 types of condition groupings: structure-service type, structure-security type, and service-security type. Each of these groupings includes a high degree of financial support, which implies that the role of financial adequacy in achieving a high level of industrial financial development is crucial to the other conditions. Secondly, under specific objective endowment conditions, except for high capital support, the other three condition variables can be substituted for each other to a certain extent, and a high level of industrial financial development can also be realized through different paths.

5.2. Practice Recommendations

The findings of this paper can provide some references for the government's initiatives to continuously promote financial "de-virtualization to reality" and improve the level of financial services to the real economy. First, the existence of synergistic effects among the four first-level indicators measuring the level of industrial financial development, namely, financial support, structural optimization, service effectiveness and financial security, reveals the complexity of achieving a high level of industrial financial development at the local level. This means that local governments can take the overall perspective of the adaptation between multiple conditions, based on the existing local conditions endowment, develop corresponding initiatives according to local conditions, form the reform path of financial de-virtualization to reality with regional characteristics, and enhance the level of financial services to the real economy. Each local government, while appropriately raising the balance of foreign currency deposits in the province, increasing social financing, developing credit, stock and bond financing, etc., combining the higher level indicators of structural optimization, service effectiveness and financial security in the province, and then selecting one of the remaining two indicators based on the local conditions and endowments to do the focus on improving the level of development of the local higher level of industrial finance with the same inputs. Secondly, in order to satisfy

the sustainability and safety of the local high-level industrial financial system, the local government should also pay attention to improving the indicators of the local lower level in the follow-up, and gradually make up the short board. Third, as a whole, China's industrial finance development level and its various level indicators show a more obvious regional imbalance, as an important indicator of the high level of industrial finance development level, the degree of financial support has become an important threshold for the development of regional industrial finance, the degree of financial support by the degree of development of the local financial industry and the degree of financial innovation has a certain degree of linkage, the local government of the underdeveloped areas of the financial industry should pay more attention to the development of financial innovation, such as green finance, science and technology finance, etc. finance, science and technology finance and other financial innovation development.

5.3. Research Limitations and Future Perspectives

There are still some limitations in this study. This paper studies the synergistic effect of the four first-level indicators measuring the level of industrial financial development, namely, financial support, structural optimization, service effectiveness and financial security, compared with regression analysis, although qualitative comparative analysis can provide researchers with the possibility of conducting more in-depth case-by-case analysis. However, it still can't analyze the "why" and "how" like in-depth longitudinal case study, and it is difficult to further analyze and explain the reasons for the synergistic effect and the functioning mechanism behind the substitution relationship. Secondly, limited by the availability of data, the data selected in this paper comes from the China (Shenzhen) Comprehensive Development Research Institute research and compilation of 2019, 2020 released in 2018, 2019 industrial financial development index, the first index was released in 2017, 2020, since the last few years of the industrial financial development data has not been publicized, and with the increasing attention paid to the development of industrial finance in recent years, the index standard, evaluation system and so on can not be analyzed and explained. As China has attached more importance to the development of industrial finance in recent years, the index standard and evaluation system can not guarantee the unadjusted changes, and the case data in the paper only contains across 1 year, which limits the explanatory strength of the research theory in the historical dimension. Finally, this paper focuses on analyzing the level of industrial finance development in each provincial administrative region, without analyzing in detail the specific situation and causes of regional imbalance between the level of industrial finance development and its various level indicators.

References

- [1] Fiss, P. C. (2011). Building better causal theories: a fuzzy set approach to typologies in organization research. *academy of management journal : amj*, 54(2),393-420.
- [2] Du Yunzhou,Jia Liangding. Group perspective and qualitative comparative analysis (QCA):A new path for management research[J]. *Management World*,2017,(06):155-167.
- [3] Khatun, R. (2016). Relation between Trade in Financial Services and Economic Growth in BRICS Economies: Cointegration and Causality Approach. *global Business Review*, 17 (1), 214-225.
- [4] Sadalia, I, Irawati, N., Hamidi, M., Giriati, & Yuliana, S. (2019). HOW THE FINANCIAL OPENNESS ACCELERATES THE ECONOMIC GROWTH OF LEADING ASEAN ECONOMIES. *journal of Security and Sustainability Issues*, 9, 473-487.
- [5] Ji Min,Liu Hong. A Preliminary Study on Industrial Finance--An Idea on the Reform of Finance Companies in China[J]. *Financial Research*,2000(08):115-120.
- [6] Li Yang. "Financial Services Real Economy" Discussion[J]. *Economic Research*,2017,52(06):4-16.

- [7] Zhang Xiaopu,Zhu Taihui. Rethinking the relationship between the financial system and the real economy[J]. International Financial Studies,2014(03):43-54.
- [8] Xue Ying,Hu Jian. Fintech boosts economic high-quality development: theoretical logic, practical foundation and path choice[J]. Reform,2020(03):53-62.
- [9] Cai Zexiang,Wu Xueqiang. Research on the Efficiency of Financial Services Real Economy Development under the New Normal--Based on Provincial Panel Data Empirical Analysis[J]. Economic Issues,2017(10):14-25.
- [10] Tan Zhongming,Tong Jie,Sheng Zhuyun. Empirical analysis of the efficiency of financial support for the development of strategic emerging industries--Based on the data of 105 listed companies in Suzhou, Zhejiang and Shanghai[J]. Wuhan Finance,2015(12):38-41.
- [11] Zhang Lin,Zhang Weikang. Research on the Efficiency and Influencing Factors of Financial Service Real Economic Growth[J]. Macro quality research,2017,5(01):47-60.
- [12] Soldier You,Yang Fang. Efficiency Measurement and Influencing Factors of Financial Services to the Real Economy--Based on Green Development Perspective[J]. Financial Forum,2019,24(04):29-44.
- [13] Ba Shusong, Chai Hongrui, Fang Yunlong, et al. Did the establishment of Pilot Free Trade Zones improve the efficiency of financial services for the real economy? Empirical evidence from the four free trade zones of Shanghai, Tianjin, Guangdong and Fujian[J]. World Economic Research, 2021 (12):3-21+132.
- [14] Zhuquan Wang,Yuanzhu Wang,Shuwei Wang. Analysis of the real level of capital efficiency and financial risk in China's real economy--What is the crux of the low efficiency and level of financial services for the real economy? [J]. Management World,2019,35(02):58-73+114+198-199.
- [15] Justin Yifu Lin,Caihui Fu,Xiaomeng Ren. How financial innovation promotes high-quality development: a perspective of new structural economics[J]. Financial Forum,2019,24(11):3-13.
- [16] Song Fangxiu. Research on Strategies for Improving the Quality and Effectiveness of Financial Services to the Real Economy[J]. People's Forum-Academic Frontier,2023(01):102-107.
- [17] Schneir C Q, Wagemann C. Set-Theoretic Methods for the Social Sciences: a Guide to Qualitative Comparative Analysis[M].Cambridge: Cambridge University Press,2012:69-81.
- [18] Andrews, R., Beynon, M. J., & McDermott, A. M. (2016). Organizational Capability in the Public Sector: a Configurational Approach. *Journal of Public Administration Research and Theory*, 26(2), 239-258.
- [19] Schneider C Q , Wagemann C .Set-Theoretic Methods for the Social Sciences: a Guide to Qualitative Comparative Analysis[J]. 2012.69-81.
- [20] Zhu Yali,Guo Changwei. A study of employee intrapreneurship driven grouping based on the theory of planned behavior[J]. Journal of Management,2020,17(11):1661-1667.
- [21] Ming Zhang,Yunzhou Du. Application of QCA methods in organization and management research:orientation, strategy and direction[J]. Journal of Management,2019,16(09):1312-1323.
- [22] M. Zhang,H.L. Lan,W.H. Chen,et al. Different paths and different effects: a study of strategic change antecedent groupings and their performance[J]. Management World,2020,36(09):168-186.