

Research on Multiple Development Paths of Urban Productivity— Based on Dynamic Qualitative Comparative Analysis (QCA)

Zelian Zheng¹ & Hongbo Lai¹

¹ Business School, University of Shanghai for Science and Technology, China

Correspondence: Zelian Zheng, Business School, University of Shanghai for Science and Technology, Shanghai 200093, China. E-mail: 835940292@qq.com

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Abstract

As the spatial carrier of human economic, social, and cultural development, cities should adapt to the times and situations to usher in a new era of urban development. To achieve this, it is necessary to deeply stimulate the multidimensional driving forces of urban development to guide and propel it forward. Based on China's urban panel data spanning from 2017 to 2021, this paper employs dynamic qualitative comparative analysis methods, grounded in institutional and evolutionary theories, to examine strategies for fostering diverse pathways for urban productivity growth. The key findings are as follows: (1) The concerted effort of multiple factors is crucial for achieving high urban productivity, which can be categorized into three primary models: government-led, credit order-driven, and dual-driven. (2) An analysis of temporal stability reveals that the consistency of these three models experiences a turning point in 2019. (3) Property rights protection and judicial services emerge as relatively stable factors. The study concludes that to break through bottlenecks in urban productivity development, the construction of China's urban business environment must not only be tailored to local conditions but also adapt to changing times.

Keywords: dynamic qualitative, comparative analysis, business Environment, informal-institution

1. Introduction

'China, as a major country, is characterized by rich diversity and enormous disparity, and its initial conditions for development are also quite different from those of other developing countries. Therefore, China is probably able to accommodate more than two development models[1].' Existing research has found that factors such as improved technological progress efficiency[2], optimized resource allocation, improved policy environment, and a factor market[3,4] with fair can all contribute to the improvement of urban productivity. However, focusing only on the impact of a single factor on productivity cannot fully reflect the complex driving mechanism of urban productivity development. Veblen believes that changes in the human economic system are jointly determined by technological progress, knowledge changes, and the environment[5,6]. Reinert believes that economic development is not merely the accumulation of material wealth, but more importantly, the selection of "high-quality economic activities", that is, "Schumpeterian" economic activities. The interaction between technological changes and institutions is the key to generating high-quality activities [7], institutional differences lead to the emergence of differentiated urban development paths [8]. Specifically, research suggests that since the business environment is a component of diversified institutions, factors related to the business environment constitute an important institutional prerequisite for ecological differences[9-11]. Different cities have varying priorities and levels of development when it comes to the business environment, which implies that the development path of urban productivity is not singular or universally applicable, but rather diverse and complex.

But how can we build diverse paths for urban productivity development? In existing research, Du Yunzhou proposed the concept of institutional configurations based on configuration theory[12]. From the perspective of costs and benefits, they measured urban productivity using total factor productivity (TFP) and utilized complex systems theory to analyze how different combinations of business environments can equivalently lead to an increase in high total factor productivity. However, this study only examines the paths for improving urban productivity from a cross-sectional perspective, whereas economic activities are progressive and constantly evolving. The outcomes of market participants' behaviors are the cumulative results of past actions, and the transformation of economic systems is a result of dynamic evolution. Existing research fails to analyze the consequences arising from the changes in economic expectations of market participants due to the evolution of

technology, knowledge, and institutions. Additionally, when analyzing the impact of institutional factors on economic growth, only governmental institutional factors are considered, whereas informal institutions also exert significant influence on the economy[13]. Combining "self-discipline and self-awareness" with "institutionalization and normalization of heteronomy" can better maintain economic and social stability and promote sustainable economic and social development[14].

Given this, the present paper, grounded in evolutionary theory and institutional logic, employs a dynamic qualitative comparative analysis method and utilizes Chinese city sample data from 2017 to 2021 to analyze the complex causal relationship between the business environment and urban productivity from a spatio-temporal perspective. Additionally, informal institutions are incorporated into the business environment indicators to provide a more comprehensive and systematic answer to the following questions:(1)How can cities develop unique competitive advantages based on differentiated business environments? (2)Are the development pathways temporally and spatially stable?

2. Literature Review and Analysis Framework

2.1 *The Impact of Institutional Factors on the Development of Productivity*

North believes that institutional factors play a decisive role in the process of economic growth, and by establishing a stable institutionalized structure, uncertainty and transaction costs in the transaction process can be reduced^[15], helping participants save the cost of information search and identification in an environment with asymmetric and incomplete information[16]. Simultaneously, economic entities' behaviors can be constrained through reward and punishment mechanisms to achieve the internalization of externalities and narrow the gap between social costs and private costs. Furthermore, a well-established market governance mechanism contributes to the formation of cooperative games, reducing behaviors that harm others for personal gain as individuals pursue maximum benefits. This, in turn, directs more resources towards uses that benefit economic growth, improves market resource allocation efficiency, and alleviates market failures[17]. Overall, institutions are a combination of formal and informal systems, "a set of formulated rules, compliance procedures, and moral and ethical norms of behavior, aimed at constraining individual actions that pursue the maximization of subjective welfare or utility[18]."

Formal institutions refer to deliberately constructed human rules centered on the property rights system, which also encompass legal frameworks, financial support systems, among others. On the one hand, in a favorable institutional environment, the market plays a leading role in resource allocation, enabling it to fully exert the function of the "visible hand" and directing market resources towards uses that benefit economic development^[19]. On the other hand, the government adopts a "nudging hand" approach by providing comprehensive legal support and efficient administrative services to the market, effectively regulating the behavior of market participants, protecting the innovative achievements and benefits of market actors[20], reducing weak constraints on transactional behaviors caused by information asymmetry, and preventing market interest distribution from favoring opportunists, thereby averting the emergence of "market self-destruction tendencies[21]".

Informal institutions refer to norms of behavior that have evolved over the long-term social activities of people, such as values and ethics. Given the existence of government failure, policymakers' bounded rationality, and the pursuit of self-interest by governments, it may lead to government intervention in the behavior of micro-entities. Secondly, as legal development is a long-term and dynamic process, there are issues of incompleteness, as well as high enforcement costs. The essence of a market economy is a credit economy, and informal institutions can play a role in compensating for market and government failures when formal contracts fail[22]. Therefore, to achieve the development of productivity, not only is it necessary to have an optimal allocation of production factors, but also a well-established credit system and fair competition market rules to compensate for the shortcomings of formal institutions[23].

2.2 *Business Environment and Regional Productivity Development*

The business environment is a crucial ecological factor that supports the development of market entities. The quality of its construction is directly related to the market-oriented allocation of production factors and whether leading enterprises in industrial chains can effectively facilitate the growth of local manufacturing enterprises[24]. As the external environment for market entity activities, a favorable business environment can break through the upper limits of business development by lowering barriers to entry, promoting fair competition through market regulation, establishing effective intellectual property protection and judicial services to safeguard corporate interests, and fostering a convenient and efficient market environment[25]. The market enhancement theory posits that "the function of government policy lies in promoting or supplementing the coordination functions of the private sector." The government is viewed as an integral participant in the economic order, with the objective of coordinating issues within the private sector and addressing market deficiencies[26]. In the later stages of

economic development, the relationship between the market and the government should gradually move away from the "big government-small market" paradigm[27]. A high-quality business environment assists the government in managing the relationship between the market and the government, breaking monopolies in factor pricing and allocation, and reducing transaction costs for market entities, particularly institutional transaction costs. This, in turn, diminishes "rent-seeking" behaviors among enterprises, enhances profitability for market entities, stimulates investment appetites, fully leverages market autonomy, promotes vigorous competition among market entities, and facilitates the survival of the fittest, ultimately leading to the formation of a high-quality regional industrial structure. Furthermore, it enables the free flow of factors, contributing to the establishment of a unified and large market[28].

Drawing on existing research[12], this paper evaluates the business environment system from six dimensions: market environment, government service environment, legal environment, financial environment, innovation environment, and credit environment. In particular, we incorporate the credit environment into the business environment system. Credit, as a glimmer of expectation held by market participants amidst uncertainty, constitutes a system for assessing and transmitting social and public information[29]. As a moral concept in the process of economic exchanges, credit serves as the foundation for society to establish long-term and stable interaction orders. In the process of trade acceptance and contract performance, the credit mechanism can effectively constrain the behavior of market participants[30]. Due to the ubiquitous "information asymmetry" in the market, the credit mechanism becomes a prerequisite for the signing of transaction contracts to ensure the self-interest of parties involved[31].

The formation of a social credit environment can incentivize market participants to transform one-time games into repeated games, helping both parties avoid falling into losses caused by dishonest behaviors such as fraud and betrayal from their counterparties. To a certain extent, it can replace formal institutions, mitigate "government failure," boost investor confidence, stimulate increased investment, and ultimately promote economic growth^[32].

3. Methodology

Since traditional regression analysis only considers the "net effect" of a single factor on the outcome variable, and social systems are complex with variables not existing in isolation[33], scholars are now widely adopting the idea of configuration analysis, adopting a holistic and systematic approach that transcends the consideration of a single factor to examine complex social issues arising from multiple concurrent factors as a whole[34]. Additionally, previous studies often overlooked the "time blind spot," failing to capture the temporal stability of cases and their sensitivity to temporal changes, whereas the development of productivity is inherently a dynamic process. To address these deficiencies, existing research often employs dynamic QCA methods[35], which, through the analysis of overall consistency, between-group consistency, and within-group consistency, can better identify the interactive effects between periods and individuals, as well as the effects of time and individuals[36].

The data on urban business environment in this paper is sourced from the "China Urban Business Environment Database," which provides evaluation indices for 296 cities in China from 2017 to 2021 across the dimensions of market environment, legal environment, government service environment, and credit environment. The data on urban total factor productivity (TFP) in this paper is derived from various sources, including the annual "China City Statistical Yearbook," the "China Statistical Yearbook," provincial statistical yearbooks, and the statistical bulletins on national economic and social development of prefecture-level cities from 2017 to 2021. For missing data, interpolation methods were employed to fill in the gaps. Due to severe data gaps in certain regions, the final analysis in this paper covers TFP data for 280 prefecture-level cities and above.

3.1 Result Variable

Most existing literature uses the Stochastic Frontier Analysis (SFA) and Data Envelopment Analysis (DEA) methods to measure total factor productivity. Due to the fact that the DEA method can reduce subjective errors and economic activities may have negative effects, it produces "bad" outputs that are not expected. Therefore, this article introduces the super efficient SBM-GML model that includes unexpected outputs to measure urban total factor productivity[12]. Its input indicators include labor input, capital input and energy input, of which labor input is expressed by employees at the end of the year, capital input draws on the research of Zhang Jun, uses the total fixed assets investment indicator of the whole society, and uses the price index of fixed assets investment to deflate, and uses 2006 as the base period to carry out a perpetual inventory to calculate the capital stock; Energy input is measured by the total social electricity consumption, and missing values are filled in using interpolation method; The output indicators include expected output and unexpected output. The expected output is the regional gross domestic product, while the unexpected output includes industrial dust, industrial wastewater, and industrial sulfur dioxide emissions.

3.2 Conditional Variables

According to the "China Urban Business Environment Database", we adopt six dimensions: market environment, government environment, rule of law environment, financial environment, innovation environment, and credit environment, and set first level indicators as conditional variables. The utility value method is used for the second level indicators, with a utility value range of [0,100]. The third level indicators are simply averaged to obtain the second level indicators. Based on the research focus of this article, we further screen the second level indicators, as shown in Table 1.

Table 1. Variable Description

Variable classification	Variable Name	Primary indicators	Secondary indicators	Indicator Description
<i>Result variable</i>	TFP			
<i>Conditional variables</i>	Market Environment	Resource acquisition	Adopting water supply, electricity supply, land supply, human capital, network and transportation services	(1)Water supply: total water supply/number of water users; (2)Power supply: electricity consumption of the whole society/registered residence population ; (3)Land supply: urban construction land area/registered residence population ; (4)Human Capital: Number of College Students; (5)Network: Internet broadband access households/registered residence population ; (6)Freight and passenger volume
		Market intermediary	Leasing and commercial services industry	Number of people in leasing and commercial service industry/registered residence population
		Fair competition	Establishment of corporate brand	Number of trademark registrations/registered residence population
			Number of entrepreneurial enterprises	Number of entrepreneurial enterprises
	Government environment	Government care	Government care level	Government Concern Index
		Government efficiency	Government size	General public budget expenditure/GDP
			Electronic government level	Electronic Service Capability Index
	Legal environment	Property protection	Administrative adjudication of patent disputes	Number of patent infringement dispute rulings/number of patent authorizations
		public security	Criminal cases involving tens of thousands of people	Criminal cases/registered residence population
		Judicial services	Law firms	Law firms
	financial environment	financing	Financing level	Deposit and loan scale of financial institutions/registered residence population
	Innovation environment	Number of patents R&D		Number of patents granted/registered residence population Science and technology

	investment	expenditure/registered population	residence
Credit environment	Contract disputes	Contract disputes/GDP	

3.3 Calibration Analysis

This article adopts the direct calibration method, using the 95% quantile, 50% quantile, and 5% quantile as calibration anchors, representing complete membership, cross membership, and complete non membership, respectively. The calibration results are shown in Table 2.

Table 2. Calibration Analysis

Variable classification	Indicator description	Name	Sign	Complete affiliation	intersection	Not affiliated at all
<i>Result variable</i>	Urban productivity	TFP	Y	2.344971306	1.275570655	0.626651774
	Finance environment	Financing	A	29.50399	17.2292	12.8874
	Innovation environment	Innovation	B	15.52427	0.874539	0.067969
<i>Conditional variables</i>	Market environment	Fair competition	C	28.85538	4.491477	1.528904
		Resource acquisition	D	29.50331	11.36006	6.112774
	Government environment	Market intermediary	E	22.69384	2.690593	0.428725
		Government care	F	73.61351	23.04444	0
		Government efficiency	G	87.18781	72.25066	54.10588
	Legal environment	Intellectual property protection	H	13.50456	0	0
		public security	I	98.95975	95.14028	83.88808
	Credit environment	Judicial services	J	12.621	1.601307	0.462698
		Social credit	K	97.08664	89.54194	65.50639

4. Results and Discussion

4.1 Necessary Conditions Analysis

Based on the QCA theory, it is necessary to first determine whether a single conditional variable is a result variable, that is, whether the factor exists in each path. Similar to traditional QCA testing steps, consistency and coverage are used as two indicators to test whether a single antecedent condition constitutes a sufficient or necessary condition. It is generally believed that necessity greater than 0.9 and coverage greater than 0.5 are the general conditions for determining necessity. In addition, the panel QCA introduces adjustment distance during analysis to provide support for consistency results. It is generally believed that when the adjustment distance is less than 0.2, the consistency accuracy is higher^[37]; However, when the adjustment distance is greater than 0.2, further analysis of the necessity of conditional variables is necessary. At the same time, in order to ensure the robustness of the results, the absence of a single variable was also analyzed. As shown in Table 3, in high total factor productivity, the consistency of all individual conditional variables is less than 0.9, indicating that these results are not necessary conditions for outcome variables. However, further investigation is needed to determine if the inter group adjustment distance between financing, government care, social credit, and total factor productivity is greater than 0.2. In non high total factor productivity, apart from financing, innovation, market intermediaries, government care, and social credit adjustment distances that do not meet the judgment criteria, further analysis is conducted on causal relationship combinations with inter group consistency adjustment distances greater than 0.2.

As shown in Table 4 and Figure1, the inter group consistency except for situations 1 and 5 is less than 0.9, so there is no necessary relationship. Scenario 1 and Scenario 5, although both had inter group consistency greater than 0.9 and coverage greater than 0.5 in 2019, were found to be concentrated on the right y-axis through scatter plot testing and did not pass the necessity test^[38].

Table 3. Necessity analysis

Condition al variables	High TFP				Low TFP			
	Aggregati on - consistency	Summar y - coverage	Inter - group consistency adjustment distance	Consisten cy adjustmen t distance within the group	Aggregati on - consistency	Summa ry - coverage	Inter - group consistency adjustment distance	Consisten cy adjustmen t distance within the group
A	0.677	0.654	0.362284	0.302811	0.648	0.687	0.408657	0.319634
~A	0.676	0.636	0.484012	0.285988	0.673	0.697	0.512995	0.285988
B	0.659	0.755	0.133321	0.42057	0.522	0.658	0.202879	0.555153
~B	0.701	0.571	0.107236	0.370102	0.806	0.722	0.055067	0.319634
C	0.723	0.783	0.081152	0.386925	0.528	0.629	0.130422	0.53833
~C	0.657	0.599	0.078253	0.403748	0.818	0.765	0.049271	0.302811
D	0.713	0.731	0.078253	0.386925	0.575	0.648	0.118829	0.487862
~D	0.656	0.584	0.040576	0.42057	0.761	0.745	0.052169	0.353279
E	0.666	0.740	0.15071	0.386925	0.545	0.666	0.255048	0.471039
~E	0.699	0.583	0.127524	0.370102	0.787	0.722	0.113033	0.302811
F	0.675	0.713	0.165202	0.302811	0.584	0.679	0.211574	0.370102
~F	0.695	0.603	0.226065	0.285988	0.752	0.718	0.162303	0.235519
G	0.732	0.685	0.063762	0.319634	0.631	0.650	0.104338	0.42057
~G	0.626	0.606	0.107236	0.403748	0.694	0.740	0.052169	0.353279
H	0.843	0.712	0.037678	0.151405	0.772	0.717	0.008695	0.201874
~H	0.665	0.726	0.095643	0.319634	0.689	0.828	0.037678	0.269165
I	0.717	0.620	0.034779	0.353279	0.719	0.684	0.052169	0.353279
~I	0.635	0.673	0.089847	0.454216	0.601	0.700	0.06666	0.487862
J	0.723	0.808	0.052169	0.403748	0.528	0.648	0.01739	0.53833
~J	0.685	0.569	0.026084	0.370102	0.843	0.770	0.014491	0.285988
K	0.740	0.647	0.170998	0.319634	0.691	0.664	0.197083	0.336456
~K	0.615	0.644	0.231862	0.42057	0.632	0.728	0.226065	0.42057

Table 4. Causal combinations with inter group consistency adjustment distance greater than 0.2

Condition	Causal situation	combination	Indicator	2017	2018	2019	2020	2021
Condition 1	A/Y		Inter group consistency	0.788	0.418	0.976	0.575	0.647
			Inter group coverage	0.672	0.793	0.502	0.774	0.764
Condition 2	~A/Y		Inter group consistency	0.751	0.895	0.182	0.807	0.736
			Inter group coverage	0.641	0.544	0.898	0.633	0.716
Condition 3	~F/Y		Inter group consistency	0.774	0.728	0.758	0.791	0.461
			Inter group coverage	0.612	0.531	0.665	0.604	0.623
Condition 4	~M/Y		Inter group consistency	0.793	0.46	0.56	0.616	0.654
			Inter group coverage	0.547	0.687	0.667	0.684	0.684
Condition 5	A/~Y		Inter group consistency	0.687	0.36	0.982	0.54	0.666

Condition 6	B/~Y	Inter group coverage	0.788	0.801	0.58	0.74	0.688
		Inter group consistency	0.438	0.453	0.493	0.634	0.616
Condition 7	E/~Y	Inter group coverage	0.714	0.69	0.678	0.639	0.596
		Inter group consistency	0.435	0.402	0.629	0.639	0.648
Condition 8	F/~Y	Inter group coverage	0.725	0.696	0.685	0.654	0.6
		Inter group consistency	0.635	0.451	0.667	0.491	0.681
Condition9	~M/~Y	Inter group coverage	0.79	0.661	0.76	0.705	0.526
		Inter group consistency	0.788	0.47	0.56	0.637	0.706
		Inter group coverage	0.729	0.824	0.764	0.72	0.647

4.2 Sufficiency Analysis

The core purpose of QCA analysis from a configuration perspective is to analyze the impact of different paths on the outcome variables. According to existing literature, the sufficiency threshold should not be less than 0.75 [18]. In constructing the truth table, this article sets the consistency threshold to 0.8, the PRI threshold to 0.7, and the case frequency to 3. Due to the significant differences in the development level of various cities in China, and the unique development environment of each prefecture level city, it is difficult to draw a unified conclusion on the impact of antecedent conditions on the results. Therefore, no directional assumptions are made for the variables, and all variables are selected as "existing or missing", ultimately obtaining intermediate and simplified solutions. Using intermediate solutions as the main approach and simplified solutions as auxiliary, discover the core and edge conditions of relevant paths. The table below shows the analysis results of the overall configuration, which includes four configurations. The overall consistency is 0.926, the overall PRI is 0.804, and the overall coverage is 0.347.

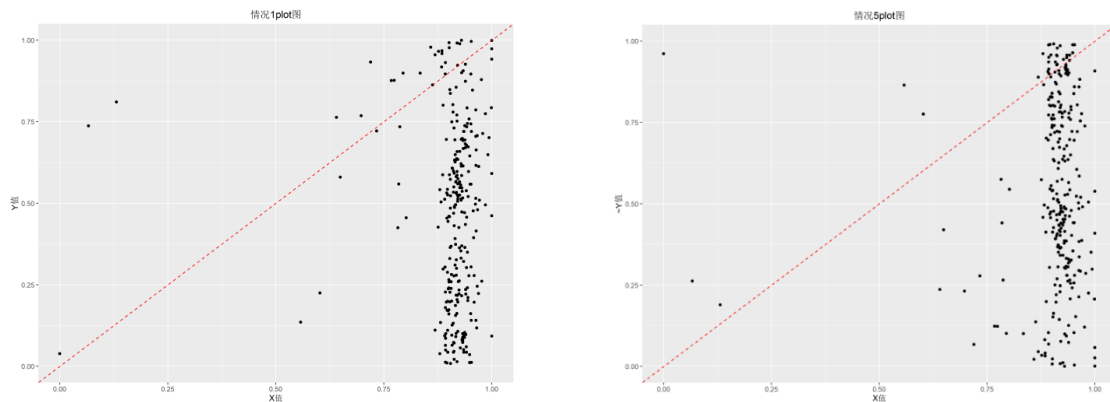


Figure 1. Necessity test scatter plot

And the consistency of a single configuration is greater than 0.9, and the inter group consistency adjustment distance is less than 0.1, and the intra group consistency adjustment distance is less than 0.2, indicating that the current four paths are key to improving total factor productivity. Specifically, based on the characteristics of the configuration path, we found that the formal institutional elements were more prominent in the first two configurations, while high social credit appeared as the core condition in S3 and S4. Therefore, we divided the configuration path into three categories: government led, credit order driven, and dual driven.

Table 5.

Conditional	Y				
	S1a	S1b	S2	S3	S4

A	⊗	⊗			●
B	●	●	●	●	●
C	●	●	●	●	●
D	●	●	●	●	●
E	●	●	●	●	●
F	●	●		●	
G	●		●	●	●
H	●	●	●		●
I		⊗	⊗	●	
J	●	●	●	●	●
K		●		●	●
Consistency	0.949	0.962	0.935	0.954	0.937
PRI	0.809	0.790	0.808	0.806	0.779
Coverage	0.278	0.222	0.347	0.266	0.309
Unique coverage	0.005	0.007	0.034	0.001	0.001
Inter group consistency adjustment distance	0.014491	0.014491	0.020288	0.014491	0.014491
Consistency adjustment distance within the group	0.151405	0.134583	0.151405	0.134583	0.168228
Total consistency	0.935				
Total PRI	0.808				
Total coverage	0.347				

Note: ● Indicates the existence of the core, ● Indicates the existence of auxiliary conditions, ⊗ Indicates a missing core condition, ⊗ Indicates missing auxiliary conditions

5. Discussion

5.1 Government Led Type

Progressive innovation driven market. Configuration S1a points out that a business environment ecosystem with non high financial environment, high market intermediaries, high government care, high property rights protection, and high judicial services as core conditions, high innovation environment, high competition fairness, high resource acquisition, and high government efficiency as marginal conditions can generate high total factor productivity growth rates. Configuration S1b points out that a business environment ecosystem composed of non high financial environment, high market intermediaries, high government care, high property rights protection, and high judicial services as core conditions, high innovation, high competition fairness, high resource acquisition, high social credit, and non high social security can also promote high total factor productivity growth rates. Comparing S1a and S1b, it can be found that the two paths have the same core conditions, with high government efficiency in configuration S1a and high social credit and non high social security in configuration S1b as marginal substitute conditions. We found that the majority of cases in the S1a configuration were concentrated between 2020 and 2021, while the majority of cases in the S1b configuration were concentrated in 2018. This is largely due to the impact of the COVID-19, which has led to the inability of the market mechanism to achieve the optimal allocation of resources, the chaos of the market order, the inclination of market interests to high users, and the uneven distribution of the market. At this time, the government needs to rely on the rule of law to protect the interests of market subjects. By improving the property rights protection system and the judicial service system, it can provide the market subjects with protection of innovation interests for a period of time, which is conducive to the appreciation of the invisible assets of enterprises, improving the competitiveness and innovation enthusiasm of enterprises, and maintaining the core competitive advantage of enterprises; The weak leadership of the government in the market is not only conducive to the full play of market mechanisms, but also provides sufficient public services for the market to alleviate market failures, thereby providing a free, convenient, and efficient environment for market entities to innovate.

Independent innovation model. Configuration S2, with high innovation, high market intermediary, high government efficiency, high property rights protection, high judicial services, and non high social security as its core conditions, and high competitive fairness and high resource acquisition as its marginal conditions, can generate a high growth rate of total factor productivity in the business environment ecosystem. In the context of weak resource acquisition ability and relatively insufficient market competition environment, the market should provide a better innovation environment for enterprises. The government should promote the development of

productivity by simplifying administrative approval procedures, protecting innovative patent achievements, and creating a stable social environment. Especially, the market should focus on creating an innovative environment. The government can implement tax and fee reduction policies, increase research and development support for industrial parks and universities, and build communication bridges for innovation entities, promote multi industry cooperation, achieve cross industry innovation, promote industrial structure upgrading, and stimulate productivity improvement.

5.2 Dual Drive

Suitability innovation model. The core conditions of configuration S3 are high resource acquisition, high market intermediary, high government care, high government efficiency, high social security, high judicial services, and high social credit. A business environment ecosystem with high innovation and high competitive fairness as marginal conditions can generate a high growth rate of total factor productivity. This path ensures the sufficient and efficient utilization of various resources required for production, promotes the flow of information and the convenience of transactions, reduces the motivation of rent-seeking behavior of business owners, reduces transaction costs caused by rent-seeking, moral hazard and other factors, and ensures that resources can be directly and fully used for productive activities; Special informal and formal institutions complement each other, and informal institutions can better alleviate the situation of "government failure"; The market economy is essentially a credit economy. When the government's functions are not fully utilized and due to information asymmetry and other reasons, it is unable to truly understand market demand, resulting in the failure of government functions. At this time, good social credit is conducive to the efficient identification of various costs in market activities by market entities, such as information identification and transmission, thereby improving economic efficiency; At the same time, the existence of social credit will make reputation crucial, increase the opportunity cost of unethical behaviors such as deception, and lose the interests of economic entities. Therefore, high social credit promotes market activity through soft constraint mechanisms, thereby promoting economic growth.

5.3 Credit Order Driven

Financial assisted market driven. The core conditions of configuration S4 are high financial environment, high resource acquisition, high market intermediary, high government efficiency, high property rights protection, and high social credit. A business environment ecosystem with high innovation, high competitive fairness, and high judicial service edge conditions can generate high total factor productivity growth rates. Under a high social credit system, finance can more fully serve enterprises. On the one hand, finance is the core channel for enterprises to obtain external funds. A sound financial environment is conducive to capital inflows, reducing financing costs for enterprises, and thus promoting technological progress and industrial upgrading. High social credit helps to stabilize the financial environment. Due to differences in market competition pressure, private enterprises in regions with high-quality financial environments often use commercial credit as a means of competition^[39]. Commercial credit is a measure taken by listed companies to reduce financing constraints in response to actual changes in macroeconomic cycles.

Specifically, we can observe that in paths with high social credit, high resource acquisition ability is the core condition for configuration. This indicates that in an environment with good social credit, resources can be allocated more efficiently. On the one hand, in the credit market, the situation of information asymmetry has been improved, transaction risks have decreased, transaction stability has increased^[40], and resources can flow to efficient enterprises; At the same time, credit is beneficial for market entities to identify trading parties, thereby narrowing the scope of transactions and enabling the optimal use of resources within a predetermined range; On the other hand, high resource acquisition capacity often leads to market disorder, and enterprises may adopt measures such as plundering in order to obtain more resources. The construction of a soft order is conducive to constraining the behavior of market entities.

5.4 Inter Group Result Analysis

To improve the time blind spot problem in traditional QCA configuration, we explore the configuration time effect through inter group consistency. As shown in the figure2, the inter group consistency of the 5 generated configurations is greater than 0.90, which is greater than the consistency judgment standard of 0.75; At the same time, the consistency adjustment distance between groups was calculated, and the results were all less than 0.1, indicating that there was no significant time effect in the above configuration. Further research on each configuration change revealed that the consistency level of all configurations fluctuated between 0.93 and 1.00 from 2017 to 2021, and the consistency of configurations S1a, S1b, and S3 reached their peak in 2019; The consistency between configuration S2 and S4 reached its lowest point in 2019. This indicates that there has been

a slight shift in the economic growth path since 2019. Observing S2 and S4, we can observe that these two paths emphasize more on innovation and financial dominance.

On the one hand, in the financial field, due to the significant impact of the epidemic on the economy after 2019, the overall macroeconomic situation has declined, and the decline in profits has led to an intensification of pessimistic expectations among enterprises. At the same time, the overseas market is tense due to various factors, and market entities generally hold a negative attitude. Since 2020, the interest rate marketization reform has accelerated, continuously changing the "dual track" characteristics of China's interest rate system. The quoted interest rate in the loan market has decreased, promoting a significant decline in enterprise loan interest rates and making finance more cost-effective. In addition, financial reform policies have been deepened, promoting small and medium-sized banks to supplement capital through multiple channels and forms, promoting commercial banks to optimize their business structure, improving internal incentive and constraint mechanisms, and unblocking policy transmission channels; In the second half of 2021, the People's Bank of China, on the one hand, continuously and steadily lowered the statutory reserve requirement ratio to reduce the cost of funds for financial institutions; At the same time, financial institutions are encouraged to increase their support for small and medium-sized enterprises through structural monetary policies, the use of small and medium-sized loan policy tools, and the increase of rediscount quotas.

On the other hand, in the field of innovation, China's innovation environment index continued to rise from 2019 to 2021 (Research on China's Innovation Index). To achieve high-quality development, it is necessary to achieve connotative growth driven by innovation. The epidemic has had a huge impact on the global economy, causing many enterprises and industries to face difficulties. In order to promote economic recovery and growth, it is necessary to seek new growth points and innovative driving forces. Innovation helps enterprises develop new products and technologies, improve production efficiency and quality, thereby enhancing market competitiveness and promoting sustainable economic development. For example, in the field of logistics, more efficient logistics distribution can be achieved by utilizing technologies such as big data and artificial intelligence; In the field of education, through online education and remote learning, students can ensure normal learning during the epidemic period. At the same time, only innovation can more effectively face future uncertainty, help enterprises develop new business models and profit methods, reduce dependence on a single market and industry, improve risk resistance, and promote economic growth.

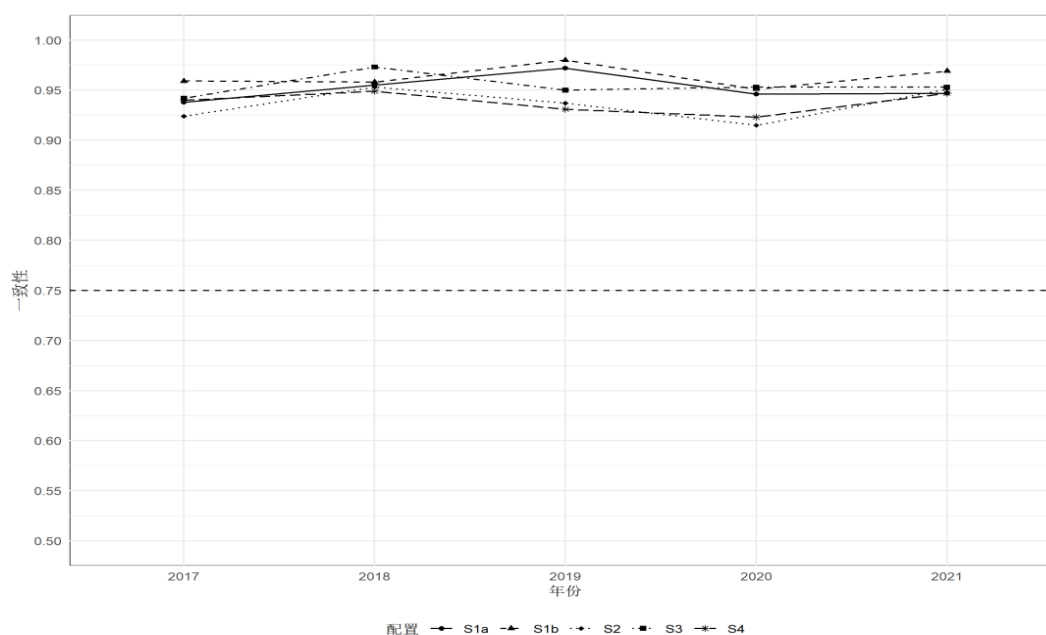


Figure 2. Inter-group consistency

6. Conclusion

This article is based on evolutionary theory and institutional logic, attempting to introduce the dynamic QCA method into the field of regional productivity development. Using panel data of Chinese cities from 2017 to 2021,

it analyzes the multiple paths of differentiated business environment combinations to improve total factor productivity. The main conclusions are as follows: Firstly, the necessity analysis results show that the business environment, but a single factor, does not constitute a necessary condition for achieving high TFP, but the financial environment has high consistency in 2019; Secondly, the analysis of the adequacy of conditional configuration shows that there are mainly five paths that are conducive to forming high total factor productivity, which can be summarized as three modes: government led, credit order driven, and dual driven; Thirdly, the inter group consistency of the configuration is lower than the judgment standard, indicating that all five paths have time stability. However, we found that the consistency of each configuration changed with 2019 as the turning point; Fourthly, the intra group consistency of the configuration is lower than the judgment standard, indicating that the five paths have high stability and spatial stability between different cities.

Based on the above conclusions, the following inspirations are proposed: (1) Strengthen the coordination between various elements of the business environment, go beyond the perspective of improving individual elements in the past, systematically optimize the business environment, and create a multi-dimensional linkage business environment to enhance regional productivity levels; (2) Emphasize the construction of informal institutions, promote market development through a credit society, and constrain the behavior of market entities; (3) Give full play to the government's "light push" of the market, and create an efficient and fair environment for the activities of market entities; (4) Pay attention to institutional linkage and use institutional vitality to encourage market entities to innovate.

References

- [1] Yongding, Y. (2013). The Reconstruction of Development Economics: A Review of Justin Yifu Lin's New Structural Economics. *Economics (Quarterly)*, 12(3), 175–1078.
- [2] Yan, P., & Wang, B. (2004). Technological Efficiency, Technological Progress, and Productivity Growth: An Empirical Analysis Based on DEA. *Economic Research Journal*, (12), 55–65.
- [3] Luo, D., Li, Y., & Shi, J. (2012). Factor market distortions, resource misalignment, and productivity. *Economic Research Journal*, 47(3), 4–14, 39.
- [4] Gai, Q., Zhu, X., & Cheng, M. (2015). Factor market distortions, monopoly power, and total factor productivity. *Economic Research Journal*, 50(5), 61–75.
- [5] Wei, J. (2000). Veblen Methodological Analysis. *Economic Sciences*, (2), 110–115.
- [6] Qi, T. (2002). Comparison of Ideas on Evolutionary Economics: Veblen, Schumpeter, Hayek. *Economic Sciences*, (4), 122–128.
- [7] Reinert, E. S. (2010). *How Rich Countries Got Rich and Why Poor Countries Stay Poor*. Chinese University Press.
- [8] Yang, K., & Gu, Y. (2022). The changing trend of the economic development gap between the north and the south in the new era of China. *Southern Economy*, (6), 25–39.
- [9] Aldrich, H. E., & Ruef, M. (2006). *Organizations Evolving*. Sage. <https://doi.org/10.4135/9781446212509>
- [10] Lim, D. S. K., Morse, E. A., Mitchell, R. K., & Seawright, K. K. (2010). Institutional Environment and Entrepreneurial Cognitions: A Comparative Business Systems Perspective. *Entrepreneurship Theory and Practice*, 34, 491–516. <https://doi.org/10.1111/j.1540-6520.2010.00384.x>
- [11] Whitley, R. (1999). *Divergent Capitalisms: The Social Structuring and Change of Business*. Oxford University Press. <https://doi.org/10.1093/oso/9780198293965.001.0001>
- [12] Du, Y. Z., Liu, Q. C., & Chen, K. W. (2022). Business Environment Ecology, Total Factor Productivity, and Multiple Modes of Urban High-Quality Development: A Configurational Analysis Based on Complex Systems Theory. *Management World*, 38(9), 127–145.
- [13] Harrison, L. E. (1985). *Underdevelopment Is a State of Mind: The Latin American Case*. Center for International Affairs, Harvard University, and Madison Books.
- [14] Jiang, Y. (2019). The Heteronomy-Based Construction of the Social Credit System. *Guangdong Social Sciences*, (2), 71–77.
- [15] North, D. C., & Thomas, R. (1971). The Rise and Fall of the Manorial System: A Theoretical Model. *Journal of Economic History*, 31(4), 777–803. <https://doi.org/10.1017/S0022050700074623>
- [16] Aoki, M. (2001). *Comparative Institutional Analysis*. Far East Press.

<https://doi.org/10.7551/mitpress/6867.001.0001>

- [17] Hong, Y. X. (2007). *Market Order and Norms*. Shanghai Joint Publishing Company and Shanghai People's Publishing House.
- [18] North, D. C. (2008). *Institutions, Institutional Change, and Economic Performance* (H. Xing, Trans.). Shanghai People's Publishing House and Greater China Publishing House.
- [19] Xu, H., & Zhou, X. H. (2020). A Study on the Impact of Institutional Environment and Industry-Finance Integration on Enterprise Innovation Performance. *Studies in Science of Science*, 38(1), 158–168.
- [20] Du, Y. Z., Liu, Q. C., & Cheng, J. Q. (2020). What kind of business environment ecology generates high urban entrepreneurial activity? An analysis based on institutional configurations. *Management World*, 36(9), 141–155.
- [21] North, D. C. (1991). *Structure and Change in Economic History*. Shanghai Joint Publishing Company and Shanghai People's Publishing House.
- [22] Zhu, Q. C. (2011). Informal Institutions and Stable Economic Growth. *Inner Mongolia Social Sciences (Chinese Edition)*, 32(4), 88–93.
- [23] Jiang, G. Q. (2012). Institutional Barriers to the Transformation of China's Economic Development Mode and Their Overcoming Strategies. *Social Scientist*, (5), 43–45, 58.
- [24] Ye, Z. Y., & Zhuang, Z. W. (2022). Leading Enterprises in Industrial Chains and the Growth of Local Manufacturing Firms: A Driving Force or a Hindrance? *China Industrial Economics*, (7), 141–158.
- [25] Wu, H. H., & Zhang, C. S. (2021). Business Environment and Industrial Ecology: Key Focuses for Stimulating the Vitality of Market Entities. *Studies and Exploration*, (3), 86–94, 180.
- [26] Aoki, M., Kim, H. K., & Okuno-Fujiwara, M. (Eds.). (1998). *The Role of Government in East Asian Economic Development: A Comparative Institutional Analysis*. China Economic Publishing House. <https://doi.org/10.1093/acprof:oso/9780198294917.001.0001>
- [27] Lu, D. M. (1999). *Analysis of the Driving Forces of China's Economic Development*. Shanxi Economic Press.
- [28] Liu, Z. B., & Wang, B. (2024). Business Environment, Industrial Relocation, and Regional Coordinated Development. *Hebei Academic Journal*, 44(2), 1–13.
- [29] Wan, J. R. (2012). On Integrity: One of the Research Topics in Social Ethics Construction During Social Transformation. *Journal of Suzhou University (Philosophy & Social Science Edition)*, 33(2), 26–30, 191.
- [30] Wang, R. L. (2019). Credit, Rule of Law, and the Institutional Foundation of Modern Economic Growth. *China Legal Science*, (2), 73–89.
- [31] Yu, Y. Z., Guo, M. H., & Guo, X. (2019). Review and Prospect of Research on the Economic Effects of Social Credit. *Journal of Macro-Quality Research*, 7(4), 80–95.
- [32] Xu, S. F. (2005). Trust, Social Capital, and Economic Performance. *Studies and Exploration*, (5), 222–225.
- [33] Jing, L. L., & Huang, H. L. (2024). Research on the Stimulation and Impact of Digital Innovation Ecosystems on Regional Innovation Capability from a Dual Dimension of Time and Space: Based on Dynamic QCA Analysis of Provincial Panel Data. *Science & Technology Progress and Policy*, 1–11.
- [34] Du, Y. Z., Li, J. X., Liu, Q. C., & Cheng, J. Q. (2021). Configurational Theory and QCA Method from a Complex Dynamic Perspective: Research Progress and Future Directions. *Management World*, 37(3), 180–197, 12–13.
- [35] Fang, F., Zhang, L. J., & Zhao, J. (2024). Exploring Multiple Paths to Enhance Agricultural Green Total Factor Productivity from an Institutional Configuration Perspective: Based on Panel Data Analysis with Dynamic QCA. *Chinese Rural Economy*, (2), 44–66.
- [36] Beynon, M. J., Jones, P., & Pickernell, D. (2020). Country-Level Entrepreneurial Attitudes and Activity Through the Years: A Panel Data Analysis Using fsQCA. *Journal of Business Research*, 115, 443–455. <https://doi.org/10.1016/j.jbusres.2019.11.021>
- [37] Zhang, F. (2023). Factors Influencing the Disclosure of Local Government Information: A Dynamic QCA Analysis Based on Provincial Panel Data. *Journal of Intelligence*, 42(1).
- [38] Schneider, C. Q., & Wagemann, C. (2012). *Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139004244>

- [39] Yu, M., & Pan, H. (2010). Financial development, trade credit, and product market competition. *Management World*, (8), 117–129.
- [40] Xiao, J. (2003). An economic analysis of honesty and trustworthiness. *Research on Financial and Economic Issues*, (4), 16–19.

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