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The Emergence of High-Level Tourism Economy Driven by New-Quality Productivity Development: An Analysis of Complex Causal Relationships Based on Regional New-Quality Productivity

Jiarui Hou[1,a,*], Tianyu Li[2,b]

[1]*School of Management Science and Engineering, Baoding University of Technology, Baoding, China*
[2]*Government and Social Governance Evaluation Research Institute, Shenyang Normal University, Shenyang, China*
a. 1304361554@qq.com, b. 757314166@qq.com
**corresponding author*

Abstract: How to promote tourism economic growth by configuring the three elements of labor force, means of labor, and objects of labor is a critical issue under the development context of new-quality productivity. Based on the theoretical framework of new-quality productivity development, this paper constructs antecedent conditions for fuzzy-set qualitative comparative analysis (fsQCA). Using tourism revenue as the outcome variable, four configurational pathways are identified: emerging strategic type, green development type, green innovation type, and talent introduction type. This study further illustrates typical cases of these four pathways for the emergence of a high-level tourism economy under the background of new-quality productivity development and proposes corresponding policy recommendations.

Keywords: New-quality productivity, Tourism economy, Emergence pathways, fsQCA, Policy recommendations

1. Introduction

The accelerated transformation and upgrading of the digital economy have driven the development of the cultural tourism industry, making innovation and digital technology the primary themes of contemporary tourism. The concept of new-quality productivity proposed by President Xi Jinping provides direction for the digital development of the cultural tourism industry. According to Xi Jinping's significant discourse on the development of new-quality productivity, compared with traditional productivity, new-quality productivity is characterized by intelligence-driven production, high integration, and digitalization, better reflecting the productivity needs of innovative technology, resource integration, and digital techniques. From the perspective of current research, scholars primarily focus on the forms of new-quality productivity and how digital transformation empowers cultural and tourism economic growth, emphasizing the relationship between socio-economic development and new-quality productivity. However, how new-quality productivity development

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promotes high-level tourism economic growth and the mechanisms by which new-quality productivity drives the tourism industry have yet to be validated.

New-quality productivity, which features high efficiency, high technology, and high quality, has emerged against the backdrop of rapid technological innovation and the transformation of the digital economy. The development of new-quality productivity represents a new trend in productivity development, breaking away from traditional economic growth pathways and facilitating rapid, high-quality economic growth. Therefore, this paper aims to address how to develop new-quality productivity to promote the transformation and upgrading of traditional urban tourism under the backdrop of tourism as a pillar industry. It seeks to explore the pathways for the sustainable development of China's tourism industry through new-quality productivity and the role of new-quality productivity in constructing a new framework for the tourism industry.

2. Theoretical Analysis

2.1. Advantages of New-Quality Productivity Compared to Traditional Productivity

Traditional productivity primarily relies on factors such as investment, labor, and land, resulting in a relatively extensive development model. In contrast, new-quality productivity is innovation-driven, integrating digital technologies deeply with the cultural and tourism industries to foster development, presenting a more intensive growth model. Traditional productivity heavily depends on human labor and basic mechanized tools, featuring labor-intensive characteristics, with production efficiency limited by resources and technological levels. On the other hand, new-quality productivity centers on technology, widely applying information technology, artificial intelligence, and biotechnology, reducing reliance on manual labor and significantly enhancing production efficiency through highly automated and intelligent production processes. Traditional productivity exhibits low integration with other sectors of the cultural and tourism industry, with clearly defined industrial boundaries, focusing mainly on conventional ancillary services such as transportation, catering, and accommodation. In contrast, new-quality productivity promotes deep integration of tourism with multiple industries, including agriculture, industry, sports, culture, and technology, forming diversified development models such as "Tourism+" and "+Tourism." These models extend the tourism industry chain, increase industrial added value, and give rise to new forms of tourism development.

2.2. Mechanisms Through Which New-Quality Productivity Promotes the Emergence of a High-Level Tourism Economy

Traditional productivity advances the tourism industry by deeply exploring the cultural connotations of tourism resources, combining them with local cultural characteristics, enhancing the quality of tourism resources, and increasing their added value. This approach contributes to tourism development. As technological innovation and economic progress advance, tourism service providers have transitioned from a single service model to more innovative, comprehensive, and personalized services, improving the visitor experience and satisfaction. This shift has fostered a reputation for high-quality services, including personalized itineraries and distinctive tour guide offerings.

Under the influence of new-quality productivity, the tourism industry emphasizes environmental protection and the efficient use of resources. Facilities such as sightseeing buses, bicycle rentals, and electric vehicle charging stations are utilized to minimize environmental impact while enhancing the visitor experience. Additionally, circular systems and shared facilities, such as wastewater treatment and eco-friendly toilets, optimize resource allocation and increase utilization rates. Modern transportation tools have accelerated short-distance travel, enabling tourists to visit multiple attractions conveniently, thereby boosting the economic development of tourist destinations [1].

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Human and natural resources are core elements for the sustainable development of the tourism industry [2]. Human resources, including history, folklore, and religious culture, enhance tourism appeal and enrich cultural and tourism products. Natural resources provide the foundational conditions for tourism, such as topography, water landscapes, and climate. Compared to traditional productivity, new-quality productivity is more efficient in the preservation and development of resources, promoting the sustainable use and development of tourism resources. While protecting the environment, it also drives economic growth. These elements complement each other, jointly advancing the long-term development of the tourism industry.

3. Data Sources and Methods

3.1. Data Sources

This study constructs a comprehensive evaluation index system to examine the mechanism by which the development of new-quality productivity promotes high-level tourism economy. The system encompasses four dimensions: New-Quality Labor Force (LF), New-Quality Labor Objects (LO), New-Quality Labor Means (LM) [3], and Tourism Economic Growth (TI).

For New-Quality Labor Force (LF), the evaluation indicators include the number of employees in emerging industries (LF1), individual employee capabilities (LF2), and the high-quality level of employees (LF3). Specifically, the number of employees in emerging industries reflects the scale of human resources in strategic emerging industries and listed companies in future industries [4]. Individual employee capabilities are measured by the average salary of employed workers, while the high-quality level of employees is determined by the number of general higher education institutions.

For New-Quality Labor Objects (LO), the evaluation indicators span multiple dimensions, such as infrastructure, future development, and ecological environment. Infrastructure includes the number of internet broadband access users and the total volume of telecommunications services. Future development is represented by the density of robot installations as a measure of technological progress, while ecological sustainability is assessed through various indicators such as investments in environmental pollution control and carbon trading [5].

Regarding New-Quality Labor Means (LM), the evaluation indicators primarily cover aspects such as technological research and development, innovation output, intelligence, greening, and data elements. Technological R&D is measured by the proportion of local fiscal expenditure allocated to scientific research. Innovation output is reflected by the number of patent applications for inventions and utility models during the year. The level of intelligence is evaluated based on the number of artificial intelligence companies [6]. Greening indicators are derived from the number of applications for green inventions and green utility models. The evaluation of data elements involves assessing the level of data utilization and the presence of data trading platforms.

Finally, Tourism Economic Growth (TI) is primarily measured by the total domestic tourism revenue of prefecture-level cities in a given year, reflecting the overall economic contribution of the tourism industry.

3.2. Methods and Variable Calibration

In the context of new-quality productivity development and the emergence of a high-level tourism economy, the data exhibit characteristics of multidimensionality, aggregation, and non-linear complex systems. The role of new-quality productivity in driving high-level tourism economy emergence is intertwined with differentiated antecedent conditions. Fuzzy-set Qualitative Comparative Analysis (fsQCA) views outcomes as the result of combinations of multiple antecedent conditions, making it a suitable tool for explaining the complex causal relationships by which regional new productivity promotes high-level tourism economy development. This study applies fsQCA to

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analyze the quality of regional new productivity construction as an antecedent condition and high-level tourism economic growth as the outcome to reveal the pathways by which the development of new-quality productivity leads to high-level tourism economic development.

Following prior studies, this research uses the 95%, 50%, and 5% percentiles as thresholds for full membership, crossover, and full non-membership, respectively. After eliminating invalid results, the descriptive statistics of antecedent conditions and outcome variables are presented in Table 1.

Table 1: Variable Calibration

Dimension	Constituent Dimensions	Code	5th Percentile	50th Percentile	95th Percentile
New-Quality Labor Force (LF)	Employees in Emerging Industries	LF1	0	0	12836
	Employee Personal Capability	LF2	64609	86284	129505
	High-Quality Employee Level	LF3	1	4	50
New-Quality Labor Objects (LO)	Infrastructure	LO1	420	1316	4319
		LO2	8	29	167
	Future Development	LO3	1	5	12
	Ecological Environment	LO4	4	41	80
		LO5	1	7	16
		LO6	99	100	100
New-Quality Labor Means (LM)	Technology R&D	LM1	0	0.01	0.06
	Innovation Output	LM2	94	768	18796
		LM3	299	2316	31672
	Intelligence Level	LM4	80	483	12586
	Green Development	LM5	9	75	1407
		LM6	15	141	1972
	Data Factors	LM7	0	1	1.6
		LM8	0	0	1
Tourism Economic Growth (TI)	Tourism Revenue	TI	0	156	1286

The necessity of conditions is a critical step in analyzing complex causal relationships. Necessity analysis refers to the condition where a causal antecedent must exist when the outcome is present. This study uses fsQCA 4.0 software to test the necessary conditions for the emergence of high-level tourism economies.

Table 2: Results of Necessity Analysis

Condition Variable	Consistency	Coverage
LF1	0.843017	0.591417
LF2	0.733545	0.640602
LF3	0.711217	0.699290
LO1	0.745413	0.679473
LO2	0.730613	0.690507

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Table 2: (continued).

LO3	0.744623	0.613923
LO4	0.654969	0.559379
LO5	0.661651	0.558549
LO6	0.730613	0.690507
LM1	0.782937	0.637348
LM2	0.715248	0.742850
LM3	0.708341	0.735483
LM4	0.660721	0.692547
LM5	0.713612	0.732148
LM6	0.719026	0.712675
LM7	0.893962	0.509167
LM8	0.821872	0.617538

As shown in Table 2, the results of the necessity analysis indicate that a single urban new productivity evaluation indicator cannot lead to the emergence of high-level tourism economic growth. The growth of urban tourism economies is guided by the comprehensive influence of multiple new productivity development indicators.

This study analyzed the causal combinations driving high-level urban tourism economic growth through the development of new productivity and named these combinations based on their configurational processes. The frequency threshold was set to 1, and the PRI consistency threshold was set to 0.8. Due to the lack of theoretical foundations supporting the development of new productivity to drive urban tourism economic growth, core and peripheral conditions were identified by comparing the nested relationships between intermediate solutions and simplified solutions. Specifically, when a causal condition appears in both the intermediate and simplified solutions, it is considered a core condition; when it only appears in the intermediate solution, it is considered a peripheral condition. The results of the fsQCA analysis are shown in the table below. Four distinct configurations emerged that drive high-level urban tourism economic growth through new productivity development. These configurations were named based on their essence, overall characteristics, concise expression, and their reflection of the connotations of new productivity development. Thus, the four configurations of high-level urban tourism economic emergence were named as follows: Emerging Strategic Type, Green Development Type, Technological Innovation Type, and Talent Attraction Type.

Table 3: Configurations of High-Level Urban Tourism Economic Emergence

Condition Variables	Emerging Strategic Type	Green Development Type	Technological Innovation Type	Talent Attraction Type
LF1	●	✪	★	✪
LF2		✪		●
LF3	●	✪		
LO1		✪	●	★
LO2	✪	★	✪	✪
LO3	✪	●	✪	✪
LO4	✪		✪	

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Table 3: (continued).

LO5		●	•	●
LO6	★			
LM1		✪	●	
LM2		✪	★	★
LM3	★			✪
LM4			●	
LM5				●
LM6		★	●	
LM7	•	•	•	•
LM8		●		✪
Consistency	9.529	9.113	9.576	9.436
Raw Coverage	0.278	0.376	0.298	0.354
Unique Coverage	0.056	0.024	0.078	0.023
Overall Solution Consistency	0.976			
Overall Solution Coverage	0.921			

Note: ● represents the presence of a core condition, ★ represents the absence of a core condition, • represents the presence of a peripheral condition, and ✪ represents the absence of a peripheral condition.

As shown in Table 3, this study identifies four high-level urban tourism economic configuration paths oriented toward the development of new productivity.

The first is the Emerging Strategic Type, whose core conditions include the number of employees in emerging industries and the high-quality level of these employees. A typical case is Guilin City, which has advanced its development as a world-class tourist city through in-depth "industry-university-research" cooperation and by optimizing its environment for talent attraction, cultivation, and retention. Specific measures include implementing key talent projects, dispatching university Ph.D. holders to enterprises to solve technological innovation problems, co-building "industry-university-research-application" platforms to pool talent for addressing challenges, and fostering enterprise-led collaborations with research institutions and universities. The city has concentrated resources to empower transformation in key industries, promoted exchanges and teamwork via platforms, and facilitated the research and application of results by young Ph.D. talents.

The second is the Green Development Type, characterized by core conditions such as robot installation density and trading mechanisms for carbon emissions, energy use rights, and pollutant discharge rights. A representative example involves a technology company that developed two products: (1) a carbon footprint calculator software that calculates, assesses, and offsets carbon emissions from tourist activities, evaluates tourism-related carbon footprints, displays detailed results compared with global standards, and provides low-carbon behavior recommendations. This software integrates with scenic spot WeChat accounts and mini-programs for carbon-neutral knowledge dissemination and education. (2) An interactive carbon footprint intelligent robot featuring carbon footprint calculations, voice interaction, video displays, intelligent explanations, facial recognition, and navigation guidance. This robot is suitable for various venues, enhances interactive experiences through multimodal interaction, and promotes the development of low-carbon tourism by improving green service quality and creating an eco-friendly tourism environment.

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The third is the Technological Innovation Type, whose core conditions are the number of internet broadband access users, the proportion of scientific expenditure in local fiscal spending, and the number of artificial intelligence enterprises. A notable case is the near-zero carbon emission demonstration scenic area in Gulangyu, Xiamen's Siming District. The district integrates efforts from multiple departments and enterprises, establishes subsidy mechanisms for technology companies, promotes electrification across the entire scenic area, enforces waste sorting and recycling policies, repurposes idle land into ecological parks, and builds digital carbon emission and intelligent urban resource management platforms.

The fourth is the Talent Attraction Type, defined by core conditions such as the average wages of employed workers, trading mechanisms for carbon emissions, energy use rights, and pollutant discharge rights, and the number of green inventions filed in the same year. An illustrative example is Qinhuangdao in Hebei Province, which has facilitated the "Tourism N+" industry boom through the integration of industry and talent. The city aligns talent acquisition with industry needs, broadens channels for attracting and gathering intellectual resources, compiles a demand directory for precise talent recruitment, and invites experts and celebrities to participate in events. Leveraging the Beijing-Tianjin-Hebei talent integration strategy, it strengthens incubation platforms, establishes talent habitats, and implements retention policies complemented by a series of supportive measures.

4. Conclusion and Policy Implications

This study explores four configuration paths for high-level urban tourism economic development, highlighting various models of new productivity and their core conditions. First, the Emerging Strategic Type focuses on high-quality emerging industry employees and optimizes the talent environment through "industry-university-research" collaboration to drive technological innovation and industrial development. Second, the Green Development Type promotes low-carbon transformation in the tourism industry by enhancing carbon trading mechanisms and applying intelligent technologies, thereby improving the quality of green tourism services. Third, the Technological Innovation Type emphasizes the collaborative development of technology enterprises and the intelligent management of carbon emissions, advancing zero-carbon scenic area construction and urban sustainability. Lastly, the Talent Attraction Type leverages talent advantages through precise recruitment and the integration of industry and talent to foster tourism industry innovation and upgrades. Collectively, these four paths provide practical strategic directions for the sustainable development of high-level urban tourism economies, with significant real-world relevance and application value. It is recommended that local governments encourage tourism enterprises to adopt intelligent technologies by offering R&D subsidies and innovation rewards, thereby advancing digital management and intelligent services in scenic areas. Additionally, research and application of technologies such as artificial intelligence, the Internet of Things, and big data in tourism should be strengthened to deepen the integration of technological innovation and industry development. Furthermore, long-term talent cultivation and stable supply can be ensured through "industry-university-research" cooperation and the establishment of talent training bases.

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