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Research on the Dynamic Measurement and Mechanism Optimization of Risk Resistance of Tourism Enterprises in Central and Western China

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Abstract: In the era of the digital economy, the deep integration of digital technology and the real economy has emerged as a strategic engine for industrial upgrading. This paper focuses on tourism enterprises in Central and Western China, which face inherent vulnerabilities to external shocks due to geographical and structural constraints. We construct a theoretical framework to evaluate the synergy between digital empowerment and traditional tourism operations, investigating its potential impact on enterprise risk resistance from both short-term financial stability and long-term organizational resilience. Through systematic logical deduction and mechanism analysis, this study reveals that digital-real integration can effectively mitigate internal control risks and enhance adaptive capacity through innovation-driven and resource optimization effects. The findings provide a theoretical basis and strategic guidance for the digital transformation and risk management of the tourism industry in less-developed regions.

Keywords: Digital-real integration; Tourism enterprises; Risk resistance; Dynamic evolution; Organizational resilience

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1. Introduction

The report of the 20th National Congress of the Communist Party of China explicitly proposed the task of "accelerating the development of the digital economy, promoting the deep integration of the digital economy and the real economy, and creating digital industry clusters with international competitiveness." With "industrial digitalization" and "digital industrialization" as its core connotations, the integration of the digital and real economies serves as a vital guarantee for real-economy enterprises in China to "stabilize growth," "promote innovation," and "advance transformation." This integration provides a solid material foundation and technical support for the modernization of China's physical industries, steering them toward high-quality development.

In practice, by introducing cutting-edge technologies such as big data, artificial intelligence, and machine learning, enterprises can effectively alleviate information asymmetry in the market. Digital transformation not

only enables firms to accurately depict user personas and achieve personalized customization and promotion but also breaks down traditional industrial boundaries, driving the reconstruction of business models and value co-creation. This deep "connotative development model" achieves the unity of economic, social, and ecological benefits, allowing real-economy enterprises to fully leverage the digital economy for empowerment in the Industry 4.0 era, while continuously enhancing their core competitiveness and environmental adaptability.

For tourism enterprises, which are highly sensitive to environmental changes, the integration of digital and real economies demonstrates a significant risk-resilience effect. As micro-entities of economic development, tourism enterprises use digital means to enhance their real-time market perception, enabling them to rapidly optimize decisions and adjust strategies during external risk shocks. This integration not only improves the stability of the tourism industrial and supply chains but also builds a "cost buffer zone" for enterprises to cope with fluctuations through the intensive allocation of resources. Ultimately, the fusion of digital and real economies assists tourism enterprises in achieving resilient growth amidst uncertainty, providing sustained momentum for the journey toward common prosperity and high-quality modernization.

2. Literature review

In this context, constructing the dynamic risk-resilience effects and exploring the enhancement paths for enterprises through the integration of the digital and real economies, aimed at achieving high-quality economic development and advancing Chinese modernization, can be categorized into the following aspects:

2.1. Defining the core research problem

Most studies have explored the mechanisms through which this integration interacts with economic growth, examining dimensions such as human capital, market scale, economic structure, industrial digitalization, technological innovation, risk resistance, and supply chain operational efficiency. These studies demonstrate that digital-real integration can significantly enhance human capital levels, promote diversification of the economic structure, drive economic digital transformation and technological innovation, and strengthen the long-term risk-resilience and economic toughness of enterprises. Furthermore, by modernizing industrial structures, promoting industrial digitalization, increasing supply chain operational efficiency, and enhancing the stability of corporate chains, it bolsters China's economic resilience and industrial chain modernization, allowing enterprises to continuously strengthen their risk-resilience under the impetus of digital-real integration [1–4].

2.2. Corporate risk management and organizational resilience

Taking earnings management and organizational resilience as examples: earnings management, a frequent short-term phenomenon in daily management, involves opportunistic behavior where management adjusts profits through professional judgment and transaction planning to achieve various objectives. Currently, the prevalent issue of earnings management in listed companies has become a focal point in accounting research, primarily focusing on perspectives such as business model innovation, internal and external information flow, resource allocation capabilities, and digital transformation [5–8]. Conversely, in the VUCA era, organizational resilience has gradually become an effective path for enterprises to turn crises into opportunities, achieve survival rebounds, and implement catch-up improvements. A few studies directly examine the relationship between the digital economy and corporate organizational resilience; these studies argue that digital technology creates a new digital operating ecosystem for the real economy, providing a solid foundation for digital transformation and thereby exerting a significant positive impact on corporate resilience [9]. Digitalization

influences the formation of organizational resilience through three aspects, connection, aggregation, and filtering; organizations use digitalization as a springboard for capability upgrades, rapidly achieving a transition from low-level to high-level capabilities, and enhancing long-term risk-resilience [10].

2.3. Research gaps and the dynamic evolution logic

Overall, existing research has conducted in-depth investigations into the logical mechanisms and measurement evaluations of digital-real integration, focusing primarily on its impact at the macroeconomic level. These studies provide feasible development directions and empirical insights for exploring how digital-real integration resists dynamic risks from multiple perspectives, laying a profound theoretical foundation for this project. However, the risk-resilience capabilities of enterprises remain relatively singular in current research, and scholars have yet to notice the dynamic evolution law of digital-real integration's risk-resilience effect, which shifts from the short term to the long term over a certain period. Specifically, there is a lack of research in academia regarding the comprehensive dynamic evolution logic of the two paths: using digital-real integration to resist short-term risks represented by earnings management and long-term risks represented by organizational resilience.

3. Theoretical framework and research propositions

Based on the dynamic evolution logic inherent in the development of digital-real integration, this study analyzes the risk-resilience effect through a framework categorized into long-term and short-term dynamic systems. By examining the differential impacts and the evolution patterns of these two types of risks over time, it is evident that the influence of digital-real integration on organizational resilience reflects a long-term risk-resilience capability, while its impact on earnings management reflects a short-term capability. These two dimensions exhibit a synergistic effect, further manifesting the risk-resilience effect of digital-real integration through spatial and temporal evolutionary mechanisms. This provides a scientific and objective basis for future corporate risk mitigation and dynamic operational strategies.

Digital-real integration promotes the growth of organizational resilience through three primary pathways as follows:

(1) It enhances corporate dynamic capabilities, allowing firms to perceive risks in advance and achieve dynamic resource allocation;

(2) It facilitates digital empowerment, providing the necessary technical and resource support for disruptive innovation;

(3) It alleviates financing constraints by improving supply chain transparency and accelerating the capitalization of data assets.

The collective action of these three pathways drives the enhancement of organizational resilience and mitigates external dynamic risks. Furthermore, the promotional effect of digital-real integration on organizational resilience exhibits heterogeneity across different regions and varying types of corporate ownership.

Digital-real integration effectively suppresses opportunistic earnings management through three mechanistic effects: restraining debt levels, enhancing governance standards, and strengthening internal controls. However, the impact of digital-real integration is characterized by regional and scale heterogeneity.

Specifically, it significantly inhibits the level and motivation of earnings management in the Eastern and Western regions, as well as in large-scale enterprises. In contrast, its inhibitory effect on earnings management in the Central region and among small-scale enterprises remains statistically insignificant.

4. The mediating mechanism of digital-real integration on risk resistance

4.1. The dynamic evolution logic of digital-real integration in risk management

The integration of the digital and real economies is a continuous and evolving process. From the perspective of dynamic evolution, the interplay between digital and physical components reshapes the fundamental logic of risk-resilience. As both the digital and real economic sectors are intrinsically dynamic, their convergence broadens the scope of economic evolution, fostering a complex, interrelated relationship between short-term and long-term risk dynamics. In the long run, organizational resilience represents a firm's capacity to withstand internal and external environmental shifts, specifically the ability to absorb environmental shocks while seizing developmental opportunities. In the short term, the efficacy of risk management is reflected in the quality of earnings management; higher standards of authentic and standardized earnings reporting correspond to enhanced corporate value. By measuring the impact and effectiveness of digital-real integration throughout this evolutionary process, we can better explore and optimize the overall risk-resilience effects of this integration.

4.2. Research on short-term risk management capability through digital-real integration

The effective suppression and prevention of opportunistic earnings management serve as a primary indicator of an enterprise's short-term risk-resilience. Earnings management refers to the practice where management adjusts reported profits through professional judgment or transaction planning within the boundaries of accounting standards, which often hinders the sustainable development of the firm. Digital-real integration bolsters short-term resilience through three primary channels as follows:

(1) It optimizes resource channels and enhances allocation efficiency; by increasing information transparency, it significantly reduces debt financing costs, thereby curbing the motivation for earnings manipulation;

(2) This integration optimizes organizational structures, reducing agency costs and mitigating unknown operational risks, which in turn necessitates higher standards for institutional and mechanistic innovation;

(3) Digital-real integration refines the internal control environment and strengthens supervisory mechanisms. Enhanced disclosure in critical operational areas compensates for existing deficiencies in earnings management, effectively constraining manipulative behaviors and fortifying the firm's immediate risk-defense capabilities.

4.3. Research on long-term risk-resilience capability through digital-real integration

The systematic enhancement of organizational resilience and dynamic capabilities reflects an enterprise's long-term risk-resilience. Organizational resilience is defined as the vital capacity to maintain core functions during adversity, recover from shocks, and achieve further growth. Digital-real integration facilitates this through several mechanisms as outlined:

(1) It dismantles information barriers, enabling precise alignment and rapid response between supply and demand ends;

(2) It fosters an innovative environment that promotes the transformation of innovation models and the optimization of organizational structures, leading to disruptive innovations that drive the evolution of

resilience;

(3) Digital-real integration transcends traditional boundaries to broaden financing channels.

By utilizing digital footprints to more comprehensively evaluate credit risks, firms can lower financing costs and improve capital efficiency. This heightened adaptability to market fluctuations ultimately consolidates organizational resilience and ensures sustained risk-resilience over the long term.

4.4. Mechanistic paths of the risk-resilience effect in digital-real integration

Based on the synergistic effects of short-term and long-term risk-resilience, this study further explores the mechanistic paths of the risk-resilience effect within a dynamic evolutionary framework. Spatial evolution is often accompanied by the adjustment and upgrading of industrial structures; as technological progress and market demands shift, it drives the digital transformation of regional economies, enhancing the quality and efficiency of development. Simultaneously, temporal evolution involves the progression of social and cultural paradigms; over time, shifts in societal development concepts and corporate value systems exert a profound influence on economic trajectories. These spatial and temporal paths provide a dual perspective for analyzing the developmental dynamics and risk-resilience effects of digital-real integration. In the process of economic development, these dimensions interweave to influence corporate activities and risk control, thereby amplifying the overall risk-resilience effect. The dynamic trends and outcomes identified through this exploration provide actionable insights for enterprises to optimize their strategic positioning and risk management in the future.

5. Conclusion

Based on the deep analysis of digital-real integration and the risk resistance of tourism enterprises in Central and Western China, this paper draws the following main conclusions. Digital-real integration is an inherent logical necessity for enhancing the risk resistance of tourism enterprises in Central and Western China. Theoretical analysis indicates that digital transformation can effectively break the “information silos” caused by geographical isolation in these regions. By constructing digital management and monitoring systems, enterprises can significantly improve their sensitivity in identifying and hedging against external risks.

Furthermore, digital-real integration reduces short-term operational risks by optimizing internal governance. The application of digital tools enhances the transparency of corporate financial and operational data, which helps standardize management behavior and reduce moral hazards stemming from information asymmetry. This governance effect effectively stabilizes the financial foundation of enterprises, improving their short-term survival capabilities when facing sudden shocks.

The improvement of long-term organizational resilience depends on the innovation path driven by digital-real integration. The deep coupling of digital technology with tourism entities prompts enterprises to shift from a traditional “ticket economy” to diversified digital consumption scenarios. This resource allocation model, based on digital innovation, enables enterprises to establish a dynamic asset portfolio, thereby fostering stronger recovery capabilities and growth potential in long-term development.

Lastly, differentiated regional development is a key point of focus for digital-real integration in Central and Western China. Although digital-real integration has a significant risk resistance effect, its efficacy is limited by the level of regional infrastructure. In the future, the digitalization process should be promoted in stages and with specific priorities based on the actual conditions of different provinces to achieve an overall leap in risk resistance capabilities.

6. Policy suggestions and optimization strategies

Based on the aforementioned conclusions, to further release the risk-shielding potential of digital-real integration and facilitate high-quality development for tourism enterprises in Central and Western China, this paper proposes the following strategies from three dimensions: government guidance, corporate transformation, and industry synergy.

6.1. Government level: Improving digital infrastructure and precise policy guidance

Efforts should be made to bridge the regional "Digital Divide." The government should increase special fiscal investment in 5G base stations, low-orbit satellite communications, and IoT sensing facilities in remote scenic areas of Central and Western China to break "information silos" at the physical level. In addition, precise policy support should be implemented. It is recommended to establish a "Special Guidance Fund for Digital-Real Integration" to encourage leading tourism enterprises and high-tech firms to jointly apply for R&D projects. For enterprises with significant digital transformation achievements and enhanced risk control capabilities, differentiated preferential policies such as tax credits, subsidized loans, and financing guarantees should be provided to reduce the marginal cost of transformation.

6.2. Corporate level: Deepening digital governance and business model innovation

Enterprises should focus on constructing a "Digital Brain" early-warning system. By introducing AI deep learning prediction systems and big data monitoring platforms, firms can achieve real-time perception of passenger flow fluctuations, cash flow health, and external environmental shocks, shifting risk management from traditional "post-hoc remediation" to "pre-emptive precision forecasting." Additionally, enterprises should actively promote the "de-ticketization" of business models. Utilizing VR/AR and Metaverse technologies to develop digital cultural products and cloud-based experience projects can build a diversified revenue matrix and enhance robustness against sudden risks. Finally, internal governance logic should be optimized. Exploring blockchain technology to construct immutable financial data chains will improve accounting transparency and standardize earnings management behavior from the source, thereby strengthening financial stability.

6.3. Industry level: Building a multi-stakeholder collaborative innovation ecosystem

On the one hand, the construction of a composite talent echelon should be strengthened. Led by industry associations and in collaboration with universities and financial institutions, interdisciplinary training programs for "Tourism + Technology + Finance" should be launched. The goal is to cultivate senior management talents who understand tourism operations and are proficient in digital auditing and big data analysis. On the other hand, the establishment of an industry-wide shared database should be promoted. Relying on provincial tourism cloud platforms, a big data sharing center for tourism in Central and Western China should be established to achieve real-time exchange of risk intelligence and coordinated responses. Through data coupling across the entire industrial chain, the collective resilience and recovery capability of the tourism industry in these regions against systemic risks can be enhanced.

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