

Financial Empowerment for High-Quality Development of Ice and Snow Economy in the New Era: Model Refinement, Practical Challenges and Promotion Strategies

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Abstract: *By adopting research methods such as the literature review method and case analysis method, this study sorts out the main models of financial empowerment for the high-quality development of the ice and snow economy in the new era, namely the four models of policy finance leadership, market capital innovation, digital finance empowerment, and insurance protection support. The practical challenges faced by financial empowerment in the ice and snow economy are mainly reflected in the following aspects: The surge in industrial financing demand and the structural imbalance of financial supply; The insufficient risk resistance capacity of the industry and the lag in risk management mechanisms; The single industrial financing channel and the imbalance of capital structure restricting development; The lag in the innovation of financial products and services restricting the release of industrial potential. Based on this, the promotion strategies for financial empowerment to drive the high-quality development of the ice and snow economy are proposed as follows: Strengthen the financial support system for the construction of ice and snow sports infrastructure; Build a full-chain financing ecosystem for the ice and snow equipment industry; Stimulate the financial innovation momentum for the integrated development of ice and snow culture and tourism; Construct a future-oriented financial innovation ecosystem for the ice and snow economy.*

Keywords: Ice and Snow Economy; Model Refinement; Practical Challenges; Promotion Strategies.

1. INTRODUCTION

As an emerging economic form integrating the sports industry with cultural tourism, health and wellness, and other formats, the ice and snow economy is not only a crucial vehicle for implementing the concept that "ice and snow are also gold and silver mountains" but also a key driver for advancing the construction of a sports power and enriching people's quality of life. In November 2024, the General Office of the State Council issued the Several Opinions on Stimulating the Vitality of the Ice and Snow Economy through the High-Quality Development of Ice and Snow Sports [1], which proposes that by 2027: the infrastructure for ice and snow sports venues will be more improved, service standards will be significantly enhanced, ice and snow sports will be more widely promoted, China's international competitiveness in ice and snow athletics will be further strengthened, and the total scale of the ice and snow economy will reach 1.2 trillion yuan. By 2030, the total scale of the ice and snow economy is expected to hit 1.5 trillion yuan. In April 2025, four authorities including the People's Bank of China jointly issued the Guiding Opinions on Financial Support for the High-Quality Development of the Sports Industry [2], which also emphasizes the need to support financial empowerment for the development of the ice and snow economy: backing the construction of key venues for ice and snow sports, supporting the expansion and upgrading of the ice and snow equipment industry, boosting the development of the ice and snow culture and tourism industries, and proactively meeting the capital needs of the ice and snow sports sector and industries related to the ice and snow economy. These policies not only clarify the strategic positioning of the ice and snow economy but also establish an institutional framework for the precise allocation of fiscal resources. However, the ice and snow economy is characterized by large investment scales, long return cycles, high geographical concentration, and distinct risk profiles. As a result, financial support still faces practical challenges such as mismatched supply structures, insufficient product innovation, and incomplete risk-sharing mechanisms. How to rely on policy guidance to optimize the financial empowerment model and address development bottlenecks has become a key issue in promoting the transformation of the ice and snow economy from high-speed growth to high-quality development. Based on this, this paper focuses on the development characteristics of the ice and snow economy in the new era, aligns with relevant policy requirements, systematically sorts out the main models of financial empowerment, conducts an in-depth analysis of the practical challenges encountered, and further proposes targeted promotion strategies, aiming to provide theoretical references and practical insights for realizing the coordinated development

of the industry and finance.

2. REFINEMENT OF THE MODELS FOR FINANCIAL EMPOWERMENT IN THE HIGH-QUALITY DEVELOPMENT OF THE ICE AND SNOW ECONOMY IN THE NEW ERA

Based on differences in the core logic, typical practices, and functional roles of financial empowerment in the high-quality development of the ice and snow economy in the new era, financial empowerment for the high-quality development of the ice and snow economy in the new era can be divided into four models: policy finance leadership, market capital innovation, digital finance empowerment, and insurance protection support, see Table 1.

Table 1: The Main Models of Financial Empowerment for the High-Quality Development of the Ice and Snow Economy in the New Era

Model	Core Logic	Typical Practices	Role Function
Policy Finance Leadership Model	Leverage the guiding role of the government and policy-based financial institutions, improve market failure through top-level design, and achieve the agglomeration of strategic resources.	Heilongjiang Province issued special policies and held investment and financing matchmaking conferences; Harbin Bank provided large-scale credit lines for the Asian Winter Games and the four-season project of Harbin Ice and Snow World.	Provide start-up funds and long-term capital for major infrastructure and key links, laying the foundation for industrial development.
Market Capital Innovation Model	Identify industrial potential through market-oriented mechanisms, and optimize the matching between capital efficiency and industrial development via innovation in financial products and business models.	Zhangjiakou launched a series of products such as "Event Operation Loans" and "Ski Equipment Loans"; Industrial Bank issued ice and snow sports-themed cards and integrated merchant resources to activate consumption.	Meet the differentiated needs of the industrial chain and stimulate the endogenous driving force of the market and consumption vitality.
Digital Finance Empowerment Model	Use technologies such as big data and artificial intelligence to improve risk control and service processes, and realize the precise and efficient allocation of financial resources driven by data.	Industrial Bank built an "Intelligent Scenic Spot Platform" to realize unified settlement and data management; China Construction Bank created the "CCB Life" APP to build a service ecosystem.	Improve the efficiency of financial services and the level of risk management, and achieve in-depth synergy between industry and finance through ecosystem construction.
Insurance Protection Support Model	Develop specialized insurance products targeting the unique risks of the industry, build risk diversification and loss compensation mechanisms, and provide guarantees for the stable operation of the industry.	China Life provided high-value accident insurance for short-track speed skating sports schools; PICC Property and Casualty launched "Ice and Snow Travel Insurance"; Forest carbon sink insurance was piloted in the Greater Khingan Range.	Enhance the risk resistance capacity of all stakeholders in the industry and build a safety net for the sustainable development of the ice and snow economy.

2.1 Policy Finance Leadership Model

The Policy Finance Leadership Model refers to a development paradigm led by the government and policy-based financial institutions. Through policy tools such as top-level design, dedicated credit facilities, and fiscal interest subsidies, it guides the precise aggregation of financial resources into strategic industries like the ice and snow economy, addressing the difficulty of financing in regions where market failure occurs. This model emphasizes the synergy between national strategies and the allocation of fiscal resources, with the goal of achieving an organic integration of an "effective government" and an "effective market." The practice of policy finance in the ice and snow economy has followed a clear path, evolving from local exploration to systematic national promotion. For instance, the Harbin Branch of the People's Bank of China (PBC), in collaboration with relevant authorities, has issued policy documents such as the Several Measures for Financial Support to the High-Quality Development of the Cultural and Tourism Industry in Heilongjiang Province. These documents propose a series of initiatives,

covering areas such as clarifying key supported fields, increasing credit supply, innovating service models, and reducing financing costs. The Branch has also taken the lead in organizing investment and financing matchmaking conferences themed "Financial Empowerment for the Cultural, Tourism and Ice-Snow Economy to Ignite Heilongjiang's Development." This event facilitated 213 million yuan in credit agreements between 8 banks and cultural tourism enterprises, with annual financing intentions exceeding 5 billion yuan across the main venue and sub-venues. It has become a typical case of collaborative advancement among banks, the government, and enterprises [3].

Through institutional arrangements, the Policy Finance Leadership Model focuses on supporting the construction of ice and snow infrastructure and key links in the industrial chain. Harbin Bank, as a cooperative bank for the Asian Winter Games, has granted 10 billion yuan in credit for supporting areas such as venue and hotel development, and nearly 3 billion yuan in credit for major cultural tourism projects [3]. To ensure the smooth construction of the Harbin Ice and Snow World project, Harbin Bank dispatched a dedicated team to develop a professional and customized financial service plan for the project. It not only provided 1 billion yuan in credit for the project but also carried out all-round cooperation with Harbin Ice and Snow World—from supporting the construction of scenic infrastructure to co-branded promotion—so as to assist the project in transitioning from "prosperity in one season" to "vitality across four seasons" [4]. In practice, the Heilongjiang Branch of the People's Bank of China has promoted the establishment of a precise connection mechanism to dynamically identify enterprises' financing needs. It has guided institutions such as the Heilongjiang Branch of Bank of China and the Greater Khingan Range Rural Commercial Bank to launch specialized products like the "Arctic Cultural Tourism Loan" and "Snow Town Post Loan." Additionally, multiple banks have collaborated with Heilongjiang Xinzheng Guarantee Company to develop the "Xindan Cultural Tourism Loan," achieving targeted financial support for the ice and snow industrial chain [3]. In short, through institutional arrangements, the Policy Finance Leadership Model lowers the financing threshold for the ice and snow industry, plays a key role in areas such as financing for major projects and matching seasonal cash flows, and provides a stable financial foundation for transforming the ice and snow economy from a "cold resource" to a "booming economy."

2.2 Market Capital Innovation Model

The Market Capital Innovation Model refers to a commercial service paradigm in which various market-oriented financial institutions provide precise and differentiated financial support for all links of the ice and snow industry chain through flexible product design, mechanism innovation, and resource integration, based on the industrial characteristics and enterprise needs in the development process of the ice and snow economy. The core driving force of this model lies in the rational judgment of financial institutions on the market potential of the ice and snow economy and its commercial development. Its essence is to achieve the optimal matching between capital efficiency and industrial development through financial innovation.

Typical practices of the Market Capital Innovation Model are mainly reflected in three dimensions: innovation of repayment mechanisms, construction of financing platforms, and expansion of scenario-based finance. In terms of financing platform construction, by establishing a "joint event financing platform," funds from sponsors, insurance institutions, and ticketing platforms are integrated to form a diversified capital supply structure, which effectively disperses the risks borne solely by banks [5]. At the same time, market capital innovation is also embodied in the in-depth expansion of consumer finance and scenario-based services. Zhangjiakou has formulated Hebei Province's first Work Mechanism for Financial Support to the High-Quality Development of the Sports Industry, guiding relevant financial institutions to launch financial products such as "Event Cultural Tourism Loans," "Event Operation Loans," and "Ice and Snow Sports Study Tours Loans" to accurately support the healthy development of the sports industry. These products precisely meet the differentiated needs of different market entities: Event Operation Loans focus on solving the problem of large upfront investment in ice and snow events; Ice and Snow Sports Study Loans support the development of ice and snow education and training institutions; and Ski Equipment Loans help ski equipment retailers expand their inventory. By the end of August, the balance of tourism industry loans in Zhangjiakou City exceeded 17 billion yuan, and the balance of ice and snow industry loans reached 6 billion yuan. The Harbin Branch of Industrial Bank has cooperated with the Heilongjiang Provincial Sports Bureau to issue ice and snow sports-themed cards. Through launching consumer cashback activities with more than 30 large-scale merchants and over 10 sports venues, it has provided 27 preferential treatments such as ticket purchase discounts for more than 70,000 cardholders, successfully activating the ice and snow consumer market [6].

2.3 Digital Finance Empowerment Model

The Digital Finance Empowerment Model refers to a modern financial service paradigm in which financial institutions leverage digital technologies such as big data, artificial intelligence, and blockchain. By collecting, analyzing, and applying data throughout the entire ice and snow industry chain, it reshapes traditional financial service processes, enabling precise risk pricing, accurate resource allocation, and targeted service delivery. Driven by technology, this model effectively addresses issues in traditional financial services, such as information asymmetry, low service efficiency, and difficulties in risk management and control.

The core of the Digital Finance Empowerment Model lies in exploring and applying data elements to build a credit evaluation system and a financial service ecosystem for the ice and snow economy. Financial institutions can introduce intellectual property pledge loans through technology-finance means, integrate multi-dimensional information with financial technology, and construct precise risk control models to improve the accuracy and efficiency of credit support for ice and snow enterprises [5]. In specific practice, digital finance empowerment is mainly reflected in two dimensions: intelligent risk control and precision marketing. In terms of intelligent risk control, the Harbin Branch of Industrial Bank has built an "Intelligent Scenic Spot Platform," providing unified settlement services for scenic spot merchants, eliminating service bottlenecks in scenic spots, and obtaining real-time business data of merchants [6]. In terms of precision marketing, the Heilongjiang Branch of China Construction Bank has carefully developed the characteristic "CCB Life" APP, creating an "one-stop" service platform with a cumulative playback volume of nearly one million times, achieving precise access to ice and snow consumption scenarios [7].

2.4 Insurance Protection Support Model

The Insurance Protection Support Model is a financial support model that, in response to the unique risk characteristics of the ice and snow industry, provides comprehensive risk protection for ice and snow enterprises and sports participants through innovative insurance products and services. The ice and snow industry is characterized by distinct seasonality, high capital intensity, high risk, long return cycles, and strong externality [5]. Moreover, activities such as skiing and ice-skating are prone to accidents; therefore, a sound insurance protection system is crucial for the sustainable development of the industry.

The Insurance Protection Support Model manifests in diverse practical forms in the ice and snow economy. First is sports accident insurance. For participants in ice and snow sports, insurance institutions have developed specialized accident insurance products for ice and snow sports. For example, in recent years, the Heilongjiang Branch of China Life Insurance Company has provided comprehensive accident insurance coverage of over 600 million yuan for the Short Track Speed Skating Juvenile Amateur Sports School in Qitaihe City, benefiting 710 coaches and athletes; the Heilongjiang Branch of PICC Property and Casualty Company has launched the winter-exclusive "Ice and Snow Travel Insurance," serving ice and snow tourism groups by providing coverage for accidental injuries and disabilities during ice and snow travel, including risks associated with ice-skating and skiing. Second is corporate property insurance. For ice and snow enterprises, insurance institutions offer products such as property insurance and business interruption insurance to cover losses caused by natural disasters, accidents, and other incidents. Especially against the backdrop of global warming, ice and snow enterprises face increased operational uncertainty, making insurance protection even more important. Third is special risk insurance. In response to the special risks of the ice and snow industry, insurance institutions have also innovatively developed new insurance products such as carbon sink insurance and weather index insurance. In the Greater Khingan Range region, insurance institutions have provided carbon sink loss risk coverage of 34.03 million yuan for 342,500 mu (approximately 22,833 hectares) of forest, with a total guaranteed carbon sink volume of 453,500 tons. Fourth is liability insurance. It provides liability insurance for operators of ice and snow venues to transfer the risk of legal compensation liability arising from participant injuries caused by operational negligence.

3. PRACTICAL CHALLENGES OF FINANCIAL EMPOWERMENT FOR THE HIGH-QUALITY DEVELOPMENT OF THE ICE AND SNOW ECONOMY IN THE NEW ERA

3.1 Surging Financing Demand of the Ice and Snow Industry and Structural Imbalance in Financial Supply

The scale of the ice and snow industry keeps expanding, and the demand for industrial investment and financing is growing rapidly. According to the Research Report on the Development of China's Ice and Snow Industry (2024)

(hereinafter referred to as the Report), the scale of China's ice and snow industry increased from 270 billion yuan in 2015 to 890 billion yuan in 2023. It is estimated to reach 970 billion yuan in 2024 and is expected to exceed 1.0053 trillion yuan in 2025. However, amid the industry's rapid development, the structural imbalance in financial supply remains prominent. Due to the obvious seasonality and dependence on natural conditions of the ice and snow industry, it poses challenges for financial institutions to conduct accurate risk assessments. Taking ice and snow tourism projects as an example, their operation is highly related to winter snowfall, temperature conditions and the sustainability of ice and snow resources. In addition, as the industry is still in a stage of rapid evolution, the market competition pattern is unstable and the policy environment is constantly adjusting. Especially with the tightening of environmental supervision, some small - scale projects that failed to complete the green transformation in a timely manner have been forced to withdraw. Faced with these dynamically changing external factors, financial institutions are striving to build forward-looking risk assessment models. In credit approval decisions, they often require a higher proportion of collateral or third-party guarantees, which has objectively raised the financing threshold and capital costs for entities in the ice and snow industry. Furthermore, capital - intensive sectors such as the construction of ice and snow venues and equipment manufacturing are characterized by long investment cycles and slow returns, which have further strengthened the prudent financing attitude of traditional financial institutions. In 2024, there were 2,678 ice and snow sports venues nationwide, a decrease of 169 compared with 2023. Among them, the number of ice - skating venues decreased by 148, with a decline rate of 7.74%. This reflects that some ice and snow venues have withdrawn from the market due to financial pressure, indicating that the current financial capacity cannot fully meet the capital demand brought by the industry's rapid development.

3.2 Insufficient Risk Resistance Capacity and Lagging Risk Management Mechanisms in the Ice and Snow Industry

The ice and snow industry is greatly affected by various factors such as seasons, climate and policies, resulting in high operational risks for enterprises. The innovation of financial insurance and risk control mechanisms is extremely urgent. The Report shows that during the 2024 - 2025 ice and snow season, the consumption volume of ski resorts nationwide reached 78.613 billion yuan. However, the number of ski resorts only increased by 3 to 865, and the number of outdoor ski resorts even decreased by 17. This may be related to the operational difficulties of ski resorts caused by factors such as extreme weather and fluctuations in tourist flow. The number of indoor real ice rinks dropped from 663 to 459, a sharp decrease of 30.8%, which reflects the practical predicament of high operating costs and unstable profitability. At present, innovative insurance products tailored for ice and snow venues, such as business interruption insurance and weather index insurance, have not been popularized. As a result, enterprises lack effective risk mitigation tools when facing natural disasters or public emergencies. Meanwhile, there is a structural mismatch between the risk assessment systems of financial institutions and the characteristics of the ice and snow industry. It is difficult for institutions to establish forward-looking risk models, forcing enterprises to meet stricter guarantee requirements when seeking financing. The uncertainty of the policy environment, especially the continuous improvement of ecological protection requirements for ice and snow projects in various regions, has also increased the compliance risks and operational costs of enterprises. Therefore, building a multi-level and all-round risk management mechanism has become a key support for promoting the healthy development of the ice and snow industry.

3.3 Single Financing Channels and Imbalanced Capital Structure Restricting the Development of the Ice and Snow Industry

As a long industrial chain format covering equipment manufacturing, event operation, tourism services and other links, the healthy development of the ice and snow economy is in urgent need of strong support from a diversified financing system. However, the prominent problem of single financing channels in the current ice and snow industry has led to an imbalanced capital structure. Specifically, the credit supply from traditional financial institutions is insufficient. Especially for small, medium and micro ice and snow enterprises, due to the lack of fixed asset collateral, their financing needs are difficult to be effectively met through bank credit channels. As a key link in the industrial chain, ice and snow equipment manufacturing is confronted with challenges such as narrow financing channels and insufficient R&D investment, which have hindered the upgrading of the entire industry. At present, China's ice and snow equipment has formed a product system covering 15 major categories, but domestic brands are still in the catching-up stage in the global market. In terms of enterprise distribution, there are 18,492 enterprises related to the ice and snow sports industry, including 15,196 ski-related enterprises and 2,047 ice - skating - related enterprises. Despite the considerable number, most of them are small, medium and micro enterprises with limited financing capacity. Take Jining Jiexiang Glove Industrial Park as an example. It produces more than 10 million dozen of ski gloves annually, with an annual output value exceeding 2 billion yuan,

demonstrating the potential of the manufacturing end. However, enterprises in this field generally face problems such as large R&D investment and insufficient collateral, making it difficult for them to obtain support from bank credit or equity financing. If financing channels cannot be expanded through industrial funds, supply chain finance, financial leasing and other methods, it will restrict the development of China's ice and snow equipment towards high-end and branding, and also fail to support the coordinated upgrading and sustainable development of the entire industrial chain.

3.4 Lagging Innovation in Financial Products and Services Restricting the Release of the Ice and Snow Industry's Potential

At present, the service innovation of financial institutions in the field of the ice and snow economy is obviously lagging behind the development needs of the industry, and the homogenization phenomenon is quite serious, which restricts the full release of the industry's potential. The lack of innovation is mainly reflected in two aspects. Firstly, there is a lack of differentiated product design for different links of the industrial chain. For instance, in the field of equipment manufacturing, professional equipment financial leasing services are insufficient; in the field of tourism services, there is a shortage of scenario-based financial solutions that are deeply integrated with consumption scenarios. Secondly, the response mechanism of financial services is lagging, making it difficult to adapt to the unique seasonal fluctuation characteristics of the ice and snow industry. For example, during the peak tourism season, the service capacity and staffing of financial institution branches are often unable to meet the surging financial needs. At the same time, the singleness of ice and snow consumer credit products has also limited the release of the participation potential of the general public. During the 2024 - 2025 ice and snow season, 292 million residents across the country participated in ice and snow sports, with a participation rate of 20.61%. The consumption scale of ice and snow sports exceeded 187.5 billion yuan, a year-on-year increase of 25%. However, the Report indicates that residents' main expenditures on participating in ice and snow sports are concentrated on tickets, transportation and catering, accounting for more than 159% in total. Currently, the market lacks special consumer credit or installment payment products for scenarios such as ice and snow tourism, training and equipment purchase, resulting in some low - and middle-income groups being deterred by high upfront costs. If financial institutions can develop customized products such as "Ice and Snow Installment Plans" and "Ski Training Loans", and establish professional teams and innovation mechanisms specifically for the ice and snow industry, it will help to further release consumption potential, expand the participation base, improve the accuracy and timeliness of financial services, and thus better support the high-quality development of the ice and snow industry.

4. PROMOTION STRATEGIES FOR FINANCIAL EMPOWERMENT OF THE HIGH-QUALITY DEVELOPMENT OF THE ICE AND SNOW ECONOMY IN THE NEW ERA

4.1 Strengthen the Financial Support System for the Construction of Ice and Snow Sports Infrastructure

4.1.1 Innovate Financing Models to Break the Capital Bottleneck in Venue Construction

The construction of ice and snow sports venues is featured by large investment scale, long recovery cycle and obvious seasonal operation characteristics. Traditional credit models are difficult to fully meet their capital needs. Commercial banks should actively explore new financing models such as "project income right pledge + government guarantee", and include expected revenues such as future ticket income, event broadcasting rights and advertising cooperation into the scope of pledge able assets. This can effectively alleviate the predicament of construction entities lacking traditional collateral. Large state-owned banks may set up "special credit quotas for the ice and snow economy" to provide medium - and long-term low-interest loans, supporting the intelligent transformation and green upgrading of venues, and improving operational efficiency and user experience.

4.1.2 Strengthen Government - Bank Cooperation and Coordinate the Layout of Regional Ice and Snow Facilities

Government departments should take the lead in establishing a special working group for the ice and snow economy, coordinate the resources of cultural and tourism, development and reform, finance and other departments, and formulate differentiated and characteristic regional development plans for ice and snow facilities. Financial institutions should take the initiative to connect with local governments' key project databases and give priority to supporting the construction of exemplary ice and snow venues. For example, relying on the opportunity of the 14th National Winter Games, Hulunbuir has promoted the construction of an alpine test flight base and an

ice and snow sports equipment industrial park. At the same time, local ice and snow industry development funds can be established to guide the participation of social capital, so as to build a diversified investment mechanism of "finance + banking + social capital". This will avoid redundant construction and homogenized competition, and enhance the overall efficiency and sustainable operation capacity of regional ice and snow facilities.

4.2 Build a Full-Chain Financing Ecosystem for the Ice and Snow Equipment Industry

4.2.1 Break Through Traditional Credit Barriers to Support Equipment Technology R&D and Transformation

The ice and snow equipment manufacturing industry is characterized by high technological intensity, long R&D cycle and rapid equipment renewal. Enterprises in this field often face the dual financing predicament of "accelerated technological obsolescence" and "difficulty in mass production transformation". Commercial banks need to break through the traditional credit logic dominated by fixed asset mortgages and promote new financing tools such as "intellectual property pledge", "order financing" and "production capacity pledge". These tools convert enterprises' intangible assets, including patented technologies, R&D capabilities and order contracts, into the basis for financing. For example, companies such as Germany's Bosch and Commercial Aircraft Corporation of China have conducted cold-region tests in Hulunbuir. Their technical certifications and mass production capabilities can serve as important references for bank credit approval. Joint-stock banks can rely on industrial parks to develop combined products such as "R&D loans + mass production loans", supporting enterprises to achieve the key leap from laboratory research to production line operation.

4.2.2 Establish a Supply Chain Financial System to Boost the Development of Industrial Clusters

In response to the problem that most ice and snow equipment manufacturing enterprises are small, medium and micro ones with insufficient collateral, financial institutions should vigorously develop supply chain finance. Taking core manufacturing enterprises as the hub, they should integrate credit resources such as accounts receivable and order contracts of upstream and downstream enterprises to provide full-chain capital support. City commercial banks can rely on the advantages of local industrial clusters, cooperate with parks and associations to establish a dual evaluation system of "credit + orders", and provide credit loans to small and medium-sized enterprises with stable cooperation and continuous orders. For example, Hulunbuir Ice and Snow Equipment Manufacturing Industrial Park has promoted the coordinated development of light and heavy equipment by building an integrated platform integrating production, sales and R&D. Financial support should be matched with this to form a closed-loop ecosystem of "manufacturing - sales - service".

4.3 Stimulate the Financial Innovation Momentum for the Integrated Development of Ice and Snow Culture and Tourism

4.3.1 Develop Cycle - Adaptive Financial Products to Alleviate Seasonal Cash Flow Pressure

Ice and snow tourism enterprises generally face the problem of cash flow mismatch, that is, "prosperity in peak seasons and debt repayment in off-seasons". Financial institutions should design "loans with mismatched repayment between peak and off-seasons" according to the characteristics of their business cycles, implementing a floating repayment mechanism of repaying more in peak seasons and less in off-seasons to reduce enterprises' short-term debt repayment pressure. For example, Harbin Ice and Snow World operates for only 70 days a year on average, but it has to bear the annual equipment maintenance costs and loan interest. Such enterprises are in urgent need of flexible credit arrangements. Joint-stock banks can cooperate with insurance institutions to develop "weather index insurance", which can hedge the operational risks caused by climate uncertainty and enhance enterprises' anti-cycle capabilities.

4.3.2 Promote the In-depth Integration of "Finance + Technology + Scenarios" to Improve Consumption Experience and Operational Efficiency

Financial institutions should strengthen the in-depth integration with ice and snow culture and tourism scenarios, and improve tourists' experience and enterprises' management efficiency through tools such as intelligent payment acquiring, digital ticketing and consumer finance. For example, Agricultural Bank of China has deployed POS machines, integrated payment codes, self-service ticket vending machines and other equipment in Xuecheng Scenic Area, realizing the full-process digital management of ticketing, accommodation and catering services. At the same time, they can cooperate with cultural and tourism departments to launch products such as "ice and snow

themed credit cards" and "co-branded ice and snow sports cards", integrating functions such as ticket purchase discounts, consumption rebates and event-related benefits to stimulate consumption potential. The application of financial technology not only improves service efficiency, but also injects new growth momentum into the ice and snow cultural tourism industry.

4.4 Build a Future-Oriented Financial Innovation Ecosystem for the Ice and Snow Economy

4.4.1 Expand Diversified Financing Channels for the Ice and Snow Industry to Reduce Dependence on Bank Credit

The traditional bank credit model can no longer fully meet the capital needs of the large-scale and diversified development of the ice and snow economy. In the future, efforts must be made to build a multi-level and multi-channel modern financing system. On the one hand, we should actively promote qualified leading ice and snow enterprises to issue "special bonds for the ice and snow industry" or carry out asset securitization. They can package future revenues with stable cash flows, such as scenic spot ticket income and cableway operation rights, for listing, which can activate stock assets in advance and raise long-term and low-cost funds for new major projects. On the other hand, we should vigorously develop ice and snow industry investment funds. Guided by government financial funds, these funds can attract extensive participation from social capital such as insurance funds and asset management companies. They can directly invest in the form of equity in ice and snow technology, smart tourism platforms and high-end equipment manufacturing projects with great growth potential, sharing innovation risks and growth dividends. This pattern of "combining equity and debt, and attaching equal importance to direct and indirect financing" will inject stronger and more sustainable financial momentum into the core ice and snow industry.

4.4.2 Promote the In-depth Integration of Finance and Technology to Create a New Paradigm of Smart Ice and Snow

Financial empowerment for the ice and snow economy should not be limited to the level of capital supply; instead, it should reshape the paradigm of industrial operation and consumption experience through the in-depth integration of cutting-edge technologies. Blockchain technology can build a platform for the capitalization of ice and snow intellectual property assets and the circulation of rights. It can tokenize and split the transactions of intangible assets such as event broadcasting rights, celebrity athletes' portrait rights and characteristic cultural tourism IPs, opening up new financing channels for asset-light business entities. By using artificial intelligence and large model technologies, financial institutions can develop more accurate "ice and snow industry risk early warning systems". These systems can dynamically analyze regional climate data, tourist flow trends and market competition patterns, providing intelligent support for credit decisions and realizing "precision irrigation" for high-quality projects. In addition, financial capital's investment and support in the construction of VR projects such as "digital twin ski resorts" and "virtual ice and snow parks" can not only help create new consumption scenarios that break the constraints of time and space, but also provide low-cost and efficient digital solutions for equipment testing, service training and safety drills, comprehensively empowering industrial upgrading.

5. CONCLUSION

This paper focuses on the role of finance in empowering the high-quality development of the ice and snow economy in the new era. It systematically sorts out four core models: policy finance leadership, market capital innovation, digital finance empowerment, and insurance protection support. Through typical cases, the paper clarifies the operation logic and practical value of each model. Meanwhile, the paper points out that the current ice and snow economy is confronted with practical challenges such as the surge in financing demand coupled with the imbalance of financial supply, insufficient risk resistance capacity, single financing channels, and lagging innovation in financial products and services. Based on this, the paper puts forward targeted promotion strategies from four dimensions—strengthening financial support for ice and snow sports infrastructure, building a full-chain financing ecosystem for the ice and snow equipment industry, stimulating the momentum of financial innovation in the integration of ice and snow culture and tourism, and forging a future-oriented financial innovation ecosystem. These strategies provide theoretical references and practical paths for realizing the coordinated development of the ice and snow economy and finance.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest relevant to this study.

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