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Research on the Mechanism of How Entrepreneurship Empowers the Generation of New Quality Productive Forces in Xi'an to Promote High-Quality Development

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Abstract

As a national-level central city in western China, Xi'an has become a model case for studying how entrepreneurial spirit drives high-quality development through empowering new productive forces. Grounded in Xi'an's realities, this paper systematically explores the intrinsic logic connecting entrepreneurial spirit, new productive forces, and high-quality development. The research focuses on: 1) Mechanisms by which entrepreneurial spirit drives corporate growth; 2) How enterprises achieve external spillover benefits for stakeholders through social responsibility fulfillment; 3) Regional entrepreneurship emergence via trickle-down effects. The study also examines challenges in cultivating new productive forces and advancing high-quality development in Xi'an, drawing lessons from advanced regions to propose a distinctive policy framework for nurturing entrepreneurial spirit that integrates dual perspectives of new productive forces and high-quality development. This provides theoretical support and practical references for regional development.

Keywords

New Quality Productive Forces, High-Quality Development, Entrepreneurship, Team Empowerment Leadership, Value Co-Creation

1. Introduction

The report of the 20th National Congress of the Communist Party of China lists "promoting the entrepreneurial spirit" alongside "improving the modern enterprise system with Chinese characteristics" and "accelerating the development of world-class enterprises", which not only solemnly affirms the historical contribu-

tions of entrepreneurs since the reform and opening up, but also strategically outlines the driving force for economic development in the new stage of development. As an important component of the spiritual lineage of Chinese Communists, the entrepreneurial spirit serves as a powerful spiritual impetus for developing new productive forces, promoting high-quality development, and advancing Chinese-style modernization. Xi'an, as a national-level central city in western China, has become an ideal model for studying "how entrepreneurial spirit empowers the generation of new productive forces in Xi'an to drive high-quality development" through its abundant scientific and educational resources and innovation platforms.

As a national-level central city in western China, Xi'an boasts 111 universities, 1814 research institutions, and over one million professional technical talents, boasting abundant scientific and educational resources. However, it once faced challenges such as low local conversion rates of technological achievements and weak industrial competitiveness. To address this dilemma, Shaanxi Province established the Qin Chuang Yuan Innovation-Driven Platform in 2021, creating a multi-level policy service system to build an integrated innovation complex combining technology transfer, incubation, and industrialization. This platform significantly boosted local commercialization of scientific achievements. In 2023, Shaanxi's technology contract transaction volume reached 412.076 billion yuan, marking a 34.95% year-on-year increase, with over half of the projects achieving local commercialization. In the photonics industry, Xi'an High-Tech Zone has gathered approximately 200 related enterprises, with core industries valued at nearly 20 billion yuan. Zhongke Weijing Photonics Technology Co., Ltd., leveraging the transformation of scientific achievements from the Xi'an Institute of Optics and Fine Mechanics under the Chinese Academy of Sciences, has overcome critical bottlenecks in high-quality manufacturing of complex aviation engine structures. Its femtosecond laser technology is applied in domestic large aircraft engines and the "Kuafu-1" solar exploration satellite. This enterprise, incubated by Xi'an Institute of Optics and Fine Mechanics, has been selected as a national-level specialized, refined, unique, and innovative "Little Giant" enterprise, with its revenue doubling for five consecutive years.

The new energy vehicle industry stands as another major highlight of Xi'an. In 2023, the city produced 98.38 million new energy vehicles, accounting for 10.4% of China's total output. As one of the world's most significant production bases for NEVs, BYD's Xi'an facility has achieved an annual capacity exceeding 1 million units, driving nearly 100 upstream and downstream enterprises to form a comprehensive supply chain ecosystem. Through its "Chain Leader System", Shaanxi Province supports industry leaders like BYD and Geely by strengthening, supplementing, and extending industrial chains, ultimately establishing a complete industrial chain ecosystem that covers battery technology, motor systems, and electronic control units (ECUs).

It can be seen that in the face of profound changes in the external environment, it is necessary to cultivate, protect and promote the excellent entrepreneurial spirit

of the new era (Li et al., 2023), and transform the powerful force contained in the entrepreneurial spirit into the driving force for economic and social development, so as to lead enterprises to play a greater role in the process of building a modern socialist country. Xi'an's practices demonstrate that entrepreneurial spirit empowers the creation of new productive forces through multiple mechanisms: First, innovative thinking drives technological breakthroughs. Xi'an entrepreneurs exhibit strong innovation awareness, propelling core technology development. For instance, the brain-computer interface rehabilitation device developed by Wang Haochong's team at Xi'an Zhen Tai Intelligent Technology Co., Ltd. has assisted over 10,000 stroke patients in rehabilitation training. Weng Jing, Deputy General Manager of Nova Nebula, stated that the company invests over 13% of annual sales revenue into R & D and holds more than 1700 independent intellectual property rights. Second, risk-taking spirit facilitates technology commercialization. Shaanxi's "Three Reforms"—separate management of job-related scientific achievements, talent evaluation for technology transfer professionals, and funding for technology commercialization from surplus funds of horizontal research projects—have resolved challenges of "daring not to commercialize", "unwillingness to commercialize", and "lack of funds for commercialization". By 2023, over 85,000 job-related scientific achievements had achieved separate management, with 18,000 results transitioning from "shelves" to "marketplaces", and researchers founded 1232 enterprises. Third, win-win cooperation builds industrial ecosystems. Xi'an attracts entrepreneurs through "Alumni Economy". By 2024, the "Dream Back to Chang'an—Million Alumni Return" campaign had signed over 100 projects, with alumni from four universities including Xi'an Jiaotong University and Xi'an University bringing in investments exceeding 600 billion yuan. These alumni entrepreneurs not only contribute capital but also advanced concepts and technologies, igniting new economic momentum for Xi'an.

New-quality productive forces refer to the advanced productive forces characterized by high technology, high efficiency, and high quality, which are dominated by innovation, break away from traditional economic growth patterns and productive force development paths, and align with the new development philosophy (Han & Zhang, 2024). High-quality development is the core goal of China's current economic and social development. It emphasizes maintaining stable economic growth while placing greater emphasis on the quality and efficiency of development, achieving comprehensive, coordinated, and sustainable socioeconomic development. The realization of high-quality economic development in China is imperative (Zhao et al., 2020). New-quality productive forces enhance production efficiency through innovation, achieve industrial optimization and upgrading, and further drive China's economy to shift from quantitative expansion to qualitative and efficiency improvements, thereby promoting high-quality development.

In Xi'an, new productive forces are driving high-quality development through concrete industrial practices. In 2024, the city's gross regional product (GDP)

reached 1331.78 billion yuan, marking a 4.6% year-on-year increase at constant prices. Notably, production volumes of products representing these new productive forces have surged: civilian drones grew 2.9 times, solar cells increased by 61.4%, 3D printing equipment rose 41.9%, and integrated circuit wafers jumped 36.7%. Xi'an has achieved remarkable progress in high-quality development across its six pillar industries—automobiles, electronics, advanced equipment, aerospace, new materials/new energy, food, and biomedicine—all growing by 4.6%, outpacing the overall growth rate of large-scale industries. The added value of large-scale industries increased by 6.5%, while the service sector saw a 4.8% rise. These figures demonstrate how new productive forces are reshaping Xi'an's industrial landscape and propelling high-quality economic growth.

Despite its remarkable achievements, Xi'an still faces multiple challenges: First, the lack of innovation spirit hinders technology commercialization; second, constrained risk-taking leads to rigid resource allocation; third, insufficient talent cultivation awareness stifles long-term development momentum. For instance, researchers often hesitate to commercialize their work due to concerns about "daring not to convert", "reluctance to convert", and "lack of funds". Although supported by the "Three Reforms" policy, small and medium-sized enterprises' limited technical absorption capacity creates a disconnect between technological advancements and industrial applications. To address these challenges, we propose the following measures: First, strengthen policy support to create a favorable business environment. Xi'an High-Tech Zone has issued the "Implementation Plan for Accelerating New Industrialization and Developing New Productive Forces", focusing on nine key pathways. Second, enhance legal safeguards to protect corporate rights. Shaanxi Province established the province-wide unified financing service platform "Shaanqi Tong", which has served 1.252 million users and handled over 12,000 enterprise requests. Third, innovate talent cultivation and recruitment to provide intellectual support. Xi'an has explored a "university-recruitment collaboration" model, forming 500 teams of "scientists + engineers" under the Qin Chuang Yuan initiative.

Theoretical analysis through CNKI literature reveals substantial research on entrepreneurial spirit, new-quality productive forces, and high-quality development. However, interdisciplinary studies combining these three concepts remain scarce, with zero core journal articles or academic theses integrating them within a unified framework. Given Xi'an's unique context, clarifying the intrinsic logic by which entrepreneurial spirit drives the creation of new-quality productive forces and propels high-quality development holds significant theoretical value and practical implications.

This study adopts a framework guided by the logical sequence of "theoretical mechanisms, practical applications, and value synthesis". First, it systematically examines the internal mechanisms through which entrepreneurial spirit empowers new-quality productive forces and drives high-quality development, with particular focus on how entrepreneurship facilitates corporate self-improvement. The analysis further explores how enterprises leverage social responsibility fulfill-

ment to extend high-quality spillover effects to other stakeholders, and how entrepreneurial spirit emerges through trickle-down effects. Second, using Xi'an's practical case as a reference, this research identifies challenges in cultivating entrepreneurial spirit and developing new-quality productive forces within Xi'an's context. Based on these findings, it proposes tailored improvement strategies and policy recommendations with local characteristics. Finally, the study synthesizes theoretical insights to outline its academic contributions and implications for regional policymaking and corporate strategic practices. This framework ensures both theoretical depth and practical relevance, providing systematic references for understanding development drivers in Xi'an and similar regions.

2. Review of Domestic and International Research Trends

2.1. The Evolving Connotation of Entrepreneurship in the Contemporary Era

Entrepreneurial spirit is a dynamic and evolving concept that embodies the integration of individual traits, capabilities, and organizational behaviors. Its essence continuously evolves with socioeconomic changes and technological advancements (Covin & Slevin, 2009). This paper systematically explores how entrepreneurial spirit drives the creation of new productive forces through three theoretical dimensions: contemporary characteristics, regional practices in Xi'an, and localized expressions. From a classical theoretical perspective, research on entrepreneurial spirit has formed three major academic schools: Schumpeter, based on innovation theory, emphasized that the essence of entrepreneurship lies in innovation, arguing that entrepreneurs drive economic structural transformation and social progress through "creative destruction". Kirzner of the Chicago School highlighted risk-taking as the core of entrepreneurship, a critical ability to navigate market uncertainties. Knight of the Austrian School focused on the entrepreneur's alertness in identifying and seizing opportunities within the market. As research deepens, innovation, proactivity, and risk-taking have become the core of entrepreneurship (Miller, 2011), forming a theoretical and practical foundation for exploring sustained enterprise growth, internal team innovation, and individual employee development, which has gained consistent recognition among scholars (Liu, 2023). It manifests not only at the individual level as innovative consciousness, market insight, and resource integration capabilities but also at the organizational level as a core driving force for enterprise development, market expansion, and value creation.

Entrepreneurship exhibits distinct temporal characteristics as socio-economic conditions evolve. In an era of global competition driven by digitalization and intelligence, it plays a crucial role in fostering new quality productive forces by promoting technological innovation, optimizing resource allocation, and enhancing organizational efficiency. Entrepreneurs, by establishing mechanisms for "creative destruction", courageously challenge conventional thinking and technological paradigms, facilitate high-quality technological innovations, and thereby improve product quality and production efficiency, transitioning enterprises from

factor-driven to innovation-driven growth (Liu, 2023). Leveraging strategic vision and resource integration skills, they promote the cross-boundary recombination and deep integration of production factors such as technology, capital, and data, significantly enhancing resource allocation efficiency (Hou et al., 2022). Entrepreneurship is externally reflected in entrepreneurial traits and managerial capabilities, which help establish agile organizations, optimize corporate structures, reduce managerial layers, improve decision-making efficiency, and ensure the cultivation and enhancement of core competitiveness (Peng et al., 2022). Through a trickle-down effect from leadership to teams and individuals, it stimulates internal innovative vitality, laying a micro-foundation for generating new quality productive forces.

Simultaneously, within China's unique cultural traditions and institutional context, entrepreneurship has been endowed with distinctive contemporary connotations and requirements. Chinese-style entrepreneurship is a complex system comprising multiple spiritual elements. Scholars have attempted to summarize its connotation; for instance, Cheng Haishui and Xu Li (2022) pointed out that it includes patriotic sentiment, courage to innovate, integrity and law-abidingness, social responsibility, international perspective, and pursuit of craftsmanship (Cheng & Xu, 2022). Su Yong and Li Zhenzhen (2023) summarized the manifestations of Chinese-style entrepreneurship across three levels: personal traits, management models, and environmental interaction (Su & Li, 2023).

Thus, entrepreneurship, starting from its classic core of innovation, risk-taking, and opportunity recognition, has been enriched by China's unique cultural and institutional environment, incorporating elements such as national sentiment, social responsibility, integrity, law-abidingness, and international perspective. In the global wave of digital revolution, it has further expanded to include openness, collaboration, and sustainability. It serves not only as the core driving force for enterprises to navigate cycles and achieve sustained growth but also as a key microfoundation for driving the economy toward innovation-led transformation, empowering the development of new quality productive forces, and realizing high-quality development. Understanding.

The entrepreneurial spirit of Xi'an is rooted in the thick history of this thousand-year-old capital, and shows distinct characteristics of the times in the wave of the new era. The specific entrepreneurial spirit is reflected in **Table 1**.

Table 1. Manifestations of entrepreneurial spirit in Xi'an.

Entrepreneurial spirit dimension of Xi'an	Typical representative	Concrete practice
creative spirit, spirit of innovation, initiative spirit	Western Superconductor	We will conquer the "bottleneck" technology of aviation titanium alloy materials and fill the domestic gap. "If we want to do it, we will do it in China and lead the world."

Continued

a sense of responsibility	Cui Ronghua, Ronghua Group	In 2027, a total of 540 million yuan has been donated to build a long-term mechanism of "industry + public welfare"
international view	Li Jihe, Mingzhu International Group	Launch the Belt and Road International Home Furnishing Cooperation Summit and build a cross-border platform
craftsmanship spirit, the spirit of workmanship	He Haiyang, Johnson & Johnson	Build "Medical Assistance Cloud Manager" SaaS platform to realize standardization of medical service quality

2.2. The Generative Logic of New Quality Productive Forces

As the global technological revolution and industrial transformation accelerate, new quality productive forces have emerged as a central theme in breaking through economic growth bottlenecks and driving high-quality development. New quality productive forces refer to an advanced productive force form where innovation plays a leading role, breaking away from traditional economic growth methods and productivity development paths. It is characterized by high technology, high efficiency, and high quality, aligning with the new development concept (Han & Zhang, 2024). The term "new" in new quality productive forces encompasses a rich connotation, involving new industries, new technologies, new fields, new models, new formats, new tracks, new dynamics, and new advantages. Its dominance and key lie in innovation-driven development (Liu, 2024). It breaks free from traditional economic growth modes and technological paths, exhibiting typical features such as technology intensity, digital empowerment, and green low-carbon practices. These very characteristics determine that its generative logic fundamentally differs from that of traditional productive forces, representing a theoretical necessity, a historical inevitability, and a practical certainty.

General Secretary Xi Jinping's important expositions on new quality productive forces represent a upholding and innovating of Marxist theory on productive forces. The concept of new quality productive forces did not emerge in a vacuum but gradually took shape through the continuous development and evolution of Marxist theory, making it a theoretical necessity (Pu & Xiang, 2025).

Marxist theory on productive forces provides a solid theoretical foundation for General Secretary Xi Jinping's important expositions on new quality productive forces. Based on the reality that technological innovation has become the primary driver of productivity development, General Secretary Xi innovatively inherited, creatively developed, and contemporarily elevated elements of Marxist productiv-

ity theory—including its theories on components, status, role, and development—thus achieving a theoretical innovation from productive forces to new quality productive forces.

Developing new quality productive forces is an inevitable choice for the progress of human society and a historical inevitability (Ma et al., 2025). This law permeates the evolution of civilization. From agrarian civilization replacing primitive gathering to industrial civilization supplanting manual production, each qualitative leap in productive forces has been an inevitable result of breaking through existing bottlenecks. Currently, traditional productive forces characterized by "high consumption and low efficiency" are unsustainable, with issues such as resource constraints and sluggish growth becoming prominent. In contrast, new quality productive forces, with technological innovation at their core, break through resource and environmental predicaments via advancements in new energy, artificial intelligence, and circular economy technologies, while simultaneously activating a new engine of innovation-driven growth. They not only conform to the historical logic of productivity iteration but also precisely address the current demands for high-quality development, serving as the essential path for advancing human society toward a more efficient and sustainable stage.

New quality productive forces represent the latest manifestation of productivity development. They are generated by revolutionary technological breakthroughs, innovative allocation of production factors, and deep industrial transformation and upgrading, making them a practical certainty (Zhai, 2025).

Revolutionary technological breakthroughs act as the "core engine" for generating new quality productive forces. Unlike conventional technological iterations, revolutionary breakthroughs—represented by frontier technologies such as artificial intelligence, quantum technology, biotechnology, new materials, and new energy—enable clustered breakthroughs that break traditional production boundaries and restructure technological systems, becoming the fundamental driver of productivity transformation. Innovative allocation of production factors serves as the "resource reconfigurer" for generating new quality productive forces. Traditional productive forces rely on the incremental input of "tangible factors" such as land, labor, and capital, whereas the core of new quality productive forces lies in the qualitative upgrade and combinatorial innovation of production factors, achieving an exponential improvement in factor allocation efficiency. Deep industrial transformation and upgrading act as the "landing vehicle" for generating new quality productive forces. Technological breakthroughs and factor innovations must ultimately promote the transformation of industries from low-end manufacturing to high-end intelligent manufacturing, from single industries to cross-border integration, and from scale expansion to green and low-carbon transition, thereby translating industrial upgrading into tangible productive forces.

Xi'an's new quality productivity, with its hard technology as the background, has shown strong momentum of development in a number of frontier fields, as shown in **Table 2**.

Table 2. New quality productivity dimension of Xi'an.

New productive forces area	Core performance	Representative enterprises	Key cases
New energy vehicles	Global level production base, whole industry chain ecology	BYD, Geely, Fosters	In 2024, the output will account for more than 10% of the country, and the output value of the industrial chain will exceed 250 billion yuan
High-end manufacturing and aerospace	Make breakthroughs in key technologies and solve "bottleneck" problems	Western Superconducting, Plutite, Zhongke Weijing	3D printed rocket tank in orbit application; femtosecond laser technology support domestic large aircraft
Energy technology	Leading in photovoltaic, hydrogen and energy storage technologies	Longji Green Energy, Singularity Energy, Huaqin New Energy	Solar cell conversion efficiency breaks world record; build "zero-carbon" light storage and charging smart charging station
Electronic information and future industry	Focus on chips, robotics and artificial intelligence	Polar Xcore, Da Sheng Technology, Nova Nebula	Chiplet chip architecture innovation; industrial robot industry scale over 10 billion

2.3. Review on the Enabling Mechanism and Effects of Entrepreneurship on the Development of New Quality Productive Forces

In the research field concerning the mechanism of how entrepreneurship promotes new quality productive forces, existing literature provides a systematic explanation of the internal logic through which entrepreneurship enables new quality productive forces from three dimensions: innovation driving, resource integration, and institutional adaptation. It also offers empirical verification of its multidimensional effects. At the innovation driving level, entrepreneurship facilitates technological breakthroughs and the recombination of production factors through the mechanism of "creative destruction" (Xu et al., 2025). Specifically, the innovative spirit, as the core driver, motivates enterprises to actively tackle key "bottleneck" technological challenges; the risk-taking spirit provides crucial support for sustained R & D investment by alleviating financing constraints faced by enterprises (Zheng et al., 2025). Existing studies indicate that digital transformation further amplifies the positive effects of entrepreneurship on innovation driving (Xu et al., 2025). At the resource integration level, entrepreneurship plays a key role in optimizing the allocation of production factors. On one hand, entrepreneurs, relying on keen market insight, accurately identify market opportunities, thereby guiding the efficient flow and rational allocation of new production factors such as data and technology (Li & Liu, 2025); on the other hand, adhering

to a cooperative spirit, entrepreneurs actively build industrial chain ecosystems. Taking LONGi Green Energy Technology as an example, synergistic collaboration among upstream and downstream enterprises in the chain has effectively enhanced total factor productivity (Jia & Guang, 2024). At the institutional adaptation level, Chinese-style entrepreneurship requires the organic integration of innovative concepts and social responsibility (Xiao & Yang, 2025). In practice, this manifests as hybrid entrepreneurship promoting the synergistic advancement of technological breakthrough innovations and corporate Environmental, Social, and Governance (ESG) practices, ultimately achieving the organic unity of economic value and social value.

However, current research on the mechanism through which entrepreneurship promotes new quality productive forces has two main shortcomings. Firstly, there is a lack of in-depth and detailed description of the transformation mechanism of entrepreneurship throughout the dynamic process from "cognition-decision-behavior". Secondly, the selection of research samples is limited. Existing studies overly rely on listed companies as analysis objects, paying insufficient attention to small and medium-sized enterprises (SMEs), which constitute a vital group. As an essential component of the economic system, SMEs possess unique advantages and potential in driving the development of new quality productive forces, and the manifestation and pathways of entrepreneurship within them may differ from those in listed companies. Furthermore, endogeneity issues within the research have not been adequately addressed. There is a particular lack of effective consideration for the reverse attraction effect of productivity levels on entrepreneurs. This omission could lead to biases in judging the causal relationship between entrepreneurship and new quality productive forces, thereby affecting the accuracy and reliability of research conclusions.

2.4. Review on the Mechanism of How New Quality Productive Forces Promote High-Quality Development

2.4.1. Theoretical Origins of New Quality Productive Forces in Promoting High-Quality Development

Advanced productive forces are a key engine driving the development of human society. Empowering high-quality development with new quality productive forces represents both an inheritance and development of Marxist theory on productive forces (Zhang & Wan, 2025). In the practice of leading economic construction, the Communist Party of China (CPC) has continuously enriched and developed Marxist productivity theory. From Mao Zedong's assertion that "productivity is the most revolutionary factor", to Deng Xiaoping's emphasis that "science and technology constitute the primary productive force", and further to Xi Jinping's observation that "innovation is the primary driving force for development", along with his scientific elaboration on new quality productive forces, a theoretical lineage that is both consistent yet evolving with the times is evident. With innovation at its core, new quality productive forces break away from traditional economic growth paths, aligning with the CPC's profound grasp of the laws

of productivity development and its practical explorations. This provides solid theoretical guidance for high-quality development.

2.4.2. Practical Motivations for New Quality Productive Forces to Drive High-Quality Development

There are two key background factors motivating the push for high-quality development through new quality productive forces: first, intensified global technological competition, where the new round of technological revolution and industrial transformation poses new challenges to China's scientific and technological self-reliance; second, the shift in domestic principal contradiction profoundly influences the historical process of China's high-quality economic development (Lei, 2025). New quality productive forces serve as both a strategic driving force supporting scientific and technological self-reliance and the building of a world sci-tech powerhouse, and a key force in resolving the contradiction between "the people's ever-growing needs for a better life and unbalanced and inadequate development" in China. The new era demands accelerating the building of an innovative nation and a world sci-tech powerhouse, necessitating that new quality productive forces play a core engine role in high-quality economic development. General Secretary Xi Jinping emphasized: "Developing new quality productive forces is an inherent requirement and an important focal point for promoting high-quality development" (Xi, 2024).

2.4.3. Practical Pathways for New Quality Productive Forces to Drive High-Quality Development

Empowering economic and social development to achieve high-quality development through new quality productive forces is a systematic project that requires building on successes and addressing shortcomings. To develop new quality productive forces and pioneer a new phase of high-quality development in China, it is essential to maintain a problem-oriented approach and implement comprehensive reforms and innovations across all areas involved in empowering high-quality development through new quality productive forces.

As a core lever for catalyzing an economic quality leap, the value creation path of new quality productive forces exhibits multi-dimensional synergistic characteristics. Current academic discourse primarily elaborates on three dimensions: innovation-driven reshaping of growth dynamics (Liu & Li, 2024); element allocation efficiency and industrial structure upgrading to break through development bottlenecks (Shen et al., 2024); and green transition to achieve sustainable development (Jiang, 2024). Zhang Jiayan et al. suggested pursuing reforms and innovations in the following areas to empower high-quality development through new quality productive forces: building a comprehensive and efficient sci-tech innovation system to strengthen innovation and achieve technological breakthroughs that generate new empowering variables; promoting the deep integration of various innovative factors and improving resource utilization efficiency; optimizing industrial layout to facilitate the transformation and application of scientific and technological achievements; and advancing institutional mechanisms reforms to

break down systemic barriers hindering innovation-driven development(Zhang & Wan, 2025). Liu Huachu et al. proposed five main practical pathways for new quality productive forces to empower the high-quality development of an open economy: strengthening sci-tech innovation drive; cultivating talent with international perspectives; promoting the upgrading of traditional industries; optimizing regional open layout; and practicing green development concepts (Liu & Wang, 2025).

As an advanced productive force form that aligns with the new development concept, new quality productive forces have become an inherent requirement and important focal point for promoting high-quality development. Through practical pathways such as sci-tech innovation leadership, industrial upgrading and integration, talent support system construction, and institutional mechanisms reform, China is forming multiple practical pathways for new quality productive forces to drive high-quality development. These pathways are interconnected and mutually reinforcing, collectively constituting a systematic and comprehensive practical framework.

3. The Overall Framework for How Entrepreneurship Empowers the Generation of New Quality Productive Forces in Xi'an to Promote High-Quality Development

New quality productive forces represent a core force driving transformative changes in innovation paradigms. Their generation demands that entrepreneurs lead enterprises beyond the scope of traditional technological innovation and incremental progress to achieve critical and disruptive technological breakthroughs.

Entrepreneurship resonates with the people-oriented and sustainable development values of Chinese modernization. By leveraging technology, organization, and interaction, it forms a new quality leadership capability in entrepreneurs. This leadership plays a key role in the high-quality development process through technological innovation effects, organizational innovation effects, and interactive innovation effects.

Based on the theory of human-intelligence division of labor and value co-creation, this framework constructs a trinity of "technology-organization-interaction" for entrepreneurs' new quality leadership. It explores the value implication and realization mechanism of how entrepreneurship empowers human-intelligence value co-creation to advance high-quality development, providing practical explanatory power for understanding how entrepreneurship acts as an engine and driving force for promoting human-machine synergistic value co-creation. The research conceptual framework is as **Figure 1**.

3.1. The Mechanism of How Entrepreneurship Enables New Quality Productive Forces

Entrepreneurship exerts an enabling effect on new quality productive forces. Given that new quality productive forces represent the core kinetic energy for high-quality economic development, researching its influence mechanism can

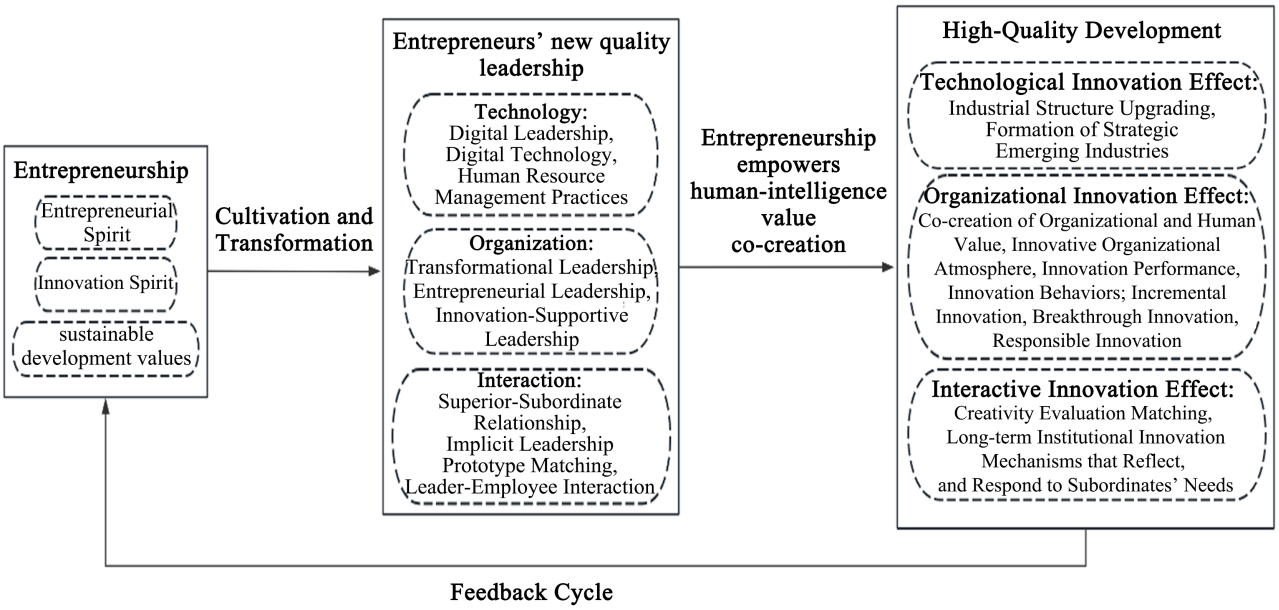

Figure 1. Conceptual model diagram of the generation logic of entrepreneurship empowering new quality productivity.

reveal the pathways through which entrepreneurship empowers the generation of new quality productive forces, providing theoretical support for enhancing the level of new quality productive forces in Western China and achieving high-quality development. Entrepreneurship promotes the generation of new quality productive forces through the following pathways.

1) Innovation-Driven

Schumpeter's innovation theory explicitly states that entrepreneurs disrupt existing market equilibrium through innovative initiatives such as introducing new technologies and products, thereby achieving a "creative destruction" effect. The essence of new quality productive forces lies in revolutionary technological breakthroughs. Within this process, the innovative spirit inherent in entrepreneurship serves as the core driving force propelling the development of new quality productive forces. Practically, entrepreneurial spirit fosters the formation and advancement of new-quality productive forces by catalysing technological breakthroughs and business model innovations. Specifically, technology-driven entrepreneurial innovation leverages digital tools to comprehensively restructure industrial chains, establishing a virtuous cycle among "technology, industry, and finance". This enables scientific and technological innovations to be more efficiently converted into industrial productivity while securing robust financial backing. In Xi'an, local entrepreneurs and financial institutions have commenced exploring the establishment of such a system. The Xi'an Science and Technology Finance Alliance, founded in 2025, integrates the entire chain from "laboratory, pilot testing, industrialization", providing diversified, relay-style financial services to technology-based enterprises. This promotes the virtuous cycle of "technology-industry-finance", supporting Xi'an's application to become a national-level science and technology innovation financial reform pilot zone and its development

as a regional science and technology innovation centre. This demonstrates that innovation driven by entrepreneurial spirit is compelling financial service models to evolve, with science and finance becoming increasingly intertwined. Concurrently, an entrepreneurial ethos rooted in deep industrial engagement is actively advancing the industrial application of disruptive technologies such as artificial intelligence and new energy, thereby fuelling the sustained development of new productive forces.

2) Resource Integration

Dynamic capability theory emphasizes that enterprises need to build and consolidate their competitive advantage by leveraging the heterogeneous characteristics of unique resources and the shaping and application of dynamic capabilities. The cultivation and development of new quality productive forces highly depend on the innovative allocation of production factors. In this process, entrepreneurship plays a key role by promoting optimal resource recombination, helping enterprises achieve leapfrog improvements in efficiency. Specifically, entrepreneurs can precisely guide the orderly flow and efficient aggregation of key production factors such as data, talent, and capital into high-tech fields, thereby providing solid factor support for the formation and development of new quality productive forces.

3) Institutional Adaptation

The vigorous development of new quality productive forces urgently requires support from new production relations. In this process, entrepreneurship achieves deep adaptation to the marketized environment by actively promoting institutional innovation. Entrepreneurs can effectively mitigate the risks associated with innovation activities by utilizing policy tools such as tax incentives and fiscal subsidies, playing a positive role in institutional gap-filling. Meanwhile, when intellectual property protection mechanisms are still imperfect, entrepreneurs can leverage the power of industry associations to promote the co-construction and sharing of technical standards, creating a favorable institutional ecology for the development of new quality productive forces.

In summary, this study constructs a theoretical mechanism for Entrepreneurship to empower the development of new-quality productive forces, revealing its crucial role as a key driving force. It is worth noting, however, that beyond the core logic of "entrepreneurship driving new quality productive forces", a reverse causal chain may also exist. That is, a region's overall leap in productivity—such as through substantial government investment in infrastructure, fostering an advantageous environment for scientific and technological innovation, or spearheading the development of specific industrial clusters—is more likely to spawn a large cohort of entrepreneurs with innovative and adventurous spirit, thereby enhancing the dynamism of the existing entrepreneurial community. In recent years, Xi'an's "Qinchuangyuan" innovation-driven platform, centred on hard technology development, has significantly optimised the regional innovation ecosystem through its very construction. This represents new quality productive forces while simultaneously galvanising city-wide enthusiasm for innovation and

entrepreneurship. This bidirectional relationship may introduce estimation biases in the measurement results of relevant variables within this study, potentially overestimating or underestimating the true effects of entrepreneurial spirit. To mitigate this endogeneity issue and achieve more reliable causal inferences, future research could adopt more rigorous econometric methodologies in its empirical analysis.

3.2. Research on the Mechanism of How New Quality Productive Forces Generation Promotes High-Quality Development

3.2.1. Scientific and Technological Innovation Leadership: Breaking Through Key Core Technologies

Scientific and technological self-reliance and self-improvement is the breakthrough point for the qualitative change of productivity. Revolutionary technological breakthroughs are the basis for generating new quality productive forces. They can facilitate the formation of new industries, new models, and new kinetic energy, making them the core element of developing new quality productive forces and the primary driving force for promoting high-quality development (Liang, 2025). Currently, global sci-tech innovation has entered a period of unprecedented intensity and activity. A new round of technological revolution and industrial transformation is restructuring the global innovation landscape and economic architecture. Facing this trend, China must take sci-tech innovation as the fundamental driving force. By relying on sci-tech innovation to empower new quality productive forces, China can promote its high-quality economic development through measures such as strengthening basic research and sci-tech innovation, reinforcing the dominant position of enterprises in sci-tech innovation, and improving the science and technology achievement transformation mechanism. Leading the development of new quality productive forces through sci-tech innovation will accelerate the formation of a new development model with innovation-driven at its core. This model not only helps enhance China's independent and self-reliant innovation capability but also provides strong momentum for high-quality economic development.

Xi'an New Quality Productivity Center (XNQP) prioritizes "hard technology" as its core mission, driving high-quality development through breakthroughs in three key sectors. First, addressing critical technological bottlenecks: XNQP drives innovation in core technologies for Xi'an's semiconductor and aerospace industries. In 2024, the city achieved a breakthrough in semiconductor technology with the development of "14 nm etching equipment" by Xi'an Zhongwei Semiconductor, increasing domestic market share from 10% to 30%. In aerospace, the "high-thrust liquid oxygen-methane engine" developed by China Aerospace Science and Technology Corporation's Sixth Academy reached 200 tons thrust, laying the foundation for commercial space development. This achievement boosted Xi'an's commercial space output value to over 40 billion yuan, enhancing technological autonomy for high-quality growth. Second, strengthening corporate innovation leadership: Enterprises have become the primary force in technological advance-

ment. In 2024, industrial enterprises in Xi'an accounted for 85% of R & D investment, with related companies maintaining an average annual 25% growth rate. Enterprises contributed 78% of the city's patent applications, up 12 percentage points from 2020, establishing them as the core driver of technological breakthroughs. Third, accelerating local technology commercialization: Through policy incentives via the Qin Chuang Yuan platform, XNQP facilitates rapid conversion of scientific achievements into practical applications within the region. In 2024, Xi'an achieved a 32% rate of local commercialization of scientific and technological achievements, marking a 15 percentage point increase from 2020. A prime example is the "Green Building Materials Technology" developed by Xi'an University of Architecture and Technology. Through collaboration with Xi'an Construction Engineering Group via the Qin Chuang Yuan platform, they established China's first low-carbon building materials production line, which reduces annual carbon dioxide emissions by 500,000 tons. This initiative has become a key driver for promoting localized conversion of scientific achievements within Xi'an's new-quality productive forces.

3.2.2. Accelerating Industrial Upgrading and Integration: Building a Modern Industrial System

Currently, China's industrial system faces the problem of being large but not strong, and large but not optimal. It is necessary to strengthen the industrial foundation for developing new quality productive forces by transforming and upgrading traditional industries, accelerating the cultivation of strategic emerging industries and future industries, thereby promoting high-quality economic development. The main measures include: accelerating the high-end, intelligent, and green transformation of traditional industries; cultivating strategic emerging industries and future industries; and promoting the deep integration of the digital economy and the real economy.

Chen Shuguang et al. also pointed out that promoting high-quality development can start from accelerating the construction of a modern industrial system and improving the formation mechanism of new quality productive forces. This involves leveraging the important supporting or service functions of entities such as the government, research institutions, universities, and enterprises for the modern industry, and collaboratively building a modern industrial system (Chen et al., 2025). Through industrial upgrading and integration, China is accelerating the construction of a modern industrial system characterized by high technology, high efficiency, and high quality. This industrial system can not only provide broad development space for new quality productive forces but also offer solid industrial support for high-quality economic development.

Xi'an New Quality Productivity drives the transformation of its industrial system towards high-tech, efficient, and high-quality development through "renewing traditional industries + cultivating emerging industries + integrating digital economy". The high-end, intelligent, and green transformation of traditional industries: For traditional industries such as equipment manufacturing and energy

chemicals in Xi'an, technological upgrades and model innovations are employed to promote their transformation. For instance, Xi'an Coal Machinery Factory achieved a 60% increase in production efficiency through digital transformation by introducing over 500 industrial robots, with product qualification rates rising from 89% to 99.2%, and output profit margins increasing from 5.8% to 9.2%. Meanwhile, Xi'an Petrochemical Company completed China's first 1 million tons/year low-carbon olefin plant through green transformation, reducing energy consumption per unit output by 30%, demonstrating significant improvements in quality enhancement and efficiency of traditional industries. Cultivation of strategic emerging industries and future industries: Leveraging New Quality Productivity, Xi'an focuses on developing four major emerging industries: artificial intelligence, aerospace, new energy, and biotechnology. In 2024, the city's AI industry achieved an output value of 89 billion yuan, attracting 420 enterprises including large companies like iFLYTEK Northwest Research Institute and Huawei Xi'an Research Institute. The aerospace industry's output value exceeded 180 billion yuan, accounting for 12% of the national total. The new energy industry has achieved an output value exceeding 210 billion yuan, with global market share leaders like LONGi Green Energy Technology and BYD driving the sector's growth as emerging industries become key drivers of high-quality development. Digital economy and real economy are deeply integrated: Xi'an's innovative productivity is accelerating the convergence of digital technologies with traditional industries, with core digital economy sectors accounting for 12.5% of GDP in 2024—a 5.8 percentage point increase from 2020. A prime example is the digital trade platform at Xi'an International Port Area, which integrates logistics data from China-Europe freight trains and cross-border e-commerce platforms to achieve full digitalization of "goods, orders, and documentation". This innovation drove cross-border e-commerce transactions to surpass 80 billion yuan in 2024, marking a 280% surge compared to 2020. Meanwhile, Xi'an Catering Group boosted revenue by 45% through its "central kitchen + online delivery" system, outperforming traditional operational models.

3.2.3. Cultivating High-Quality Innovative Teams: Stimulating Talent Innovation Vitality

Talent is the most important active agent for forming new quality productive forces and the core element of technological innovation and industrial transformation. Cultivating high-quality innovative talent is a core strategy for accelerating the development of new quality productive forces. It is essential to cultivate high-quality sci-tech talent to create a main force for technological innovation that drives high-quality economic development, providing solid talent support and intellectual guarantee for developing new quality productive forces.

Ren Baoping et al. pointed out that deepening the reform of the talent development system and mechanism should, according to the requirements of developing new quality productive forces, smoothly connect the virtuous cycle of education, science technology, and talent, and improve the working mechanisms for talent

cultivation, introduction, use, and rational flow (Ren & Zhang, 2025). Liu Li et al. suggested that cultivating high-quality innovative teams should focus on the following aspects: innovating the talent cultivation system, constructing a vocational education system that meets the development needs of new quality productive forces, and optimizing the talent development environment (Liu & Ren, 2024). Through talent cultivation and team building, the formation of a talent support system adapted to the development of new quality productive forces can be accelerated. This system can not only provide intellectual support for technological innovation but also offer talent guarantee for industrial transformation. Next, it is necessary to further deepen the integrated reform of the education, sci-tech, and talent systems and mechanisms, build institutional mechanisms that support comprehensive innovation, and provide more complete institutional guarantees for talent development.

Xi'an New Quality Productivity centers on talent development, building a high-quality innovative workforce through a full-chain mechanism of cultivation, recruitment, and utilization to support high-quality development. Innovation Talent Cultivation System Development: Xi'an boasts 63 universities and 75 national key laboratories, leveraging the advantages of higher education resources to promote industry-university-research collaborative education. For instance, the University of Electronic Science and Technology of China (UESTC) collaborated with Huawei Xi'an Research Institute to establish a 5G communication specialty class, with curriculum directly aligned to corporate technical demands. The employment rate for 2024 graduates reached 100%, with 85% entering enterprises related to New Quality Productivity. Xi'an Vocational and Technical College partnered with BYD to build a new energy vehicle training base, annually cultivating over 2000 skilled professionals to provide talent support for New Quality Productivity. Precise Introduction of High-Level Talents: Through policies like the "Qinchuangyuan Talent Program" and "Xi'an Talent Development Program," Xi'an precisely attracts high-level talents in the field of New Quality Productivity, with 80% concentrated in artificial intelligence, aerospace, biotechnology, and related sectors. Optimization of Talent Development Environment: Xi'an enhances the talent development environment through policy incentives and service guarantees. In terms of policy incentives, talents in the field of New Quality Productivity receive "up to 5 million yuan entrepreneurship subsidies" and priority access to school enrollment for their children. Regarding service guarantees, 12,000 talent apartments have been constructed to address housing issues. In 2024, Xi'an's net talent inflow rate reached 8.5%, a 5.2 percentage point increase from 2020, demonstrating significant talent aggregation effects that provide "intellectual support" for high-quality development.

Looking forward, developing new quality productive forces and promoting high-quality development is a long-term task and a systematic project. It requires maintaining resolve, accurately grasping the direction, anchoring the reform tasks proposed by the Third Plenary Session of the 20th CPC Central Committee, and advancing step by step towards the set goals.

3.3. A Cross-Level Study on the Cultivation and Emergence of Entrepreneurship

The development of new-generation digital technologies has blurred the boundaries of organizational activities and also expanded the boundaries of entrepreneurship (Zhao et al., 2021). Entrepreneurship is no longer a trait belonging only to a specific group of individuals but coalesces within action units such as individuals, teams, and organizations. Haier's proposition to "make everyone an entrepreneur, a CEO" is a concrete manifestation of this phenomenon. The trickle-down of entrepreneurship from the individual level to the organizational level is a key factor for sustained organizational innovation. This process requires adaptive adjustments to organizational structures and reforms of management systems to promote the manifestation of implicit entrepreneurial spirit among organizational members, thereby exerting a collective effect within the organization.

However, current research on entrepreneurship predominantly focuses on leader traits and employee behavior at the micro level and organizational culture shaping at the macro level, often neglecting the mediating role of the team level and cross-level studies on entrepreneurship, including its trickle-down effect (Cheng et al., 2019). This research gap leads to a lack of operational pathways in policy practices aimed at achieving the goal that "everyone is an entrepreneur", urgently necessitating the construction of a theoretical framework for the synergistic cultivation of entrepreneurship across "individual-team-organization" levels.

Regarding the triggering factors for the emergence of entrepreneurship, leaders with entrepreneurial spirit can, through their leadership behaviors, stimulate and awaken the intrinsic entrepreneurial potential within team members and employees (Gan et al., 2020). This allows entrepreneurship to transcend mere mindset and be manifested in action. Simultaneously, entrepreneurship, as a role model, creates a trickle-down effect between "leaders-teams-employees".

Team empowering leadership is a comprehensive leadership model that integrates core elements of various leadership styles. It aims to stimulate team potential, enhance overall effectiveness and creativity. Its core components include empowering leadership, transformational leadership, visionary leadership, and spiritual leadership. These four styles synergize to build a complete empowerment system. Empowering Leadership, the foundational practice dimension, focuses on delegating authority and granting trust through means like providing autonomy in decision-making, offering resource and capability support, and enhancing intrinsic motivation. Transformational Leadership, the motivational catalyst dimension, focuses on stimulating intrinsic motivation and leading organizational change through inspiration, individualized consideration, and intellectual stimulation. Visionary Leadership, the direction-guiding dimension, focuses on building shared goals and aligning team direction by painting a clear vision, communicating and integrating goals into daily work, and creating a sense of meaning. Spiritual Leadership, the cultural and value foundation dimension, focuses on

constructing meaning, values, and a culture of trust through establishing trust and psychological safety, conveying belief and value-driven purpose, and shaping an inclusive and developmental culture.

Team empowering leadership systematically activates team potential from institutional, motivational, directional, and cultural dimensions, fostering innovation consciousness, proactivity, and risk-taking spirit. Furthermore, within the context of Chinese modernization, it cultivates innovation, responsibility and commitment, the spirit of master craftsmen, global perspective, and bottom-line thinking, ultimately leading to enhanced team creativity and sustainable organizational success—that is, the awakening of team entrepreneurship.

In the VUCA era, team collaboration and autonomous innovation have become key to corporate adaptability. Team entrepreneurship is not a simple aggregate of the leader's individual capabilities but rather the collective behavioral characteristics exhibited by the team, which can effectively improve team and company performance (Chen & Hao, 2008). Team entrepreneurship, by shaping the team climate and norms, can continuously influence its members' behaviors. When a team demonstrates innovation, proactivity, and risk-taking, employees are more likely to be motivated to spontaneously generate employee entrepreneurship and unconsciously exhibit proactive change behaviors. Employees with an entrepreneurial spirit will autonomously go beyond the requirements of their defined roles to proactively initiate innovative behaviors to improve workplace performance (Covin et al., 2020). In the process of proactive innovation, employees will autonomously engage in the improvement of new processes and technologies, namely generating proactive change behaviors. This process completes the trickle-down effect from team entrepreneurship to employee entrepreneurship. The specific model is shown in **Figure 2**.

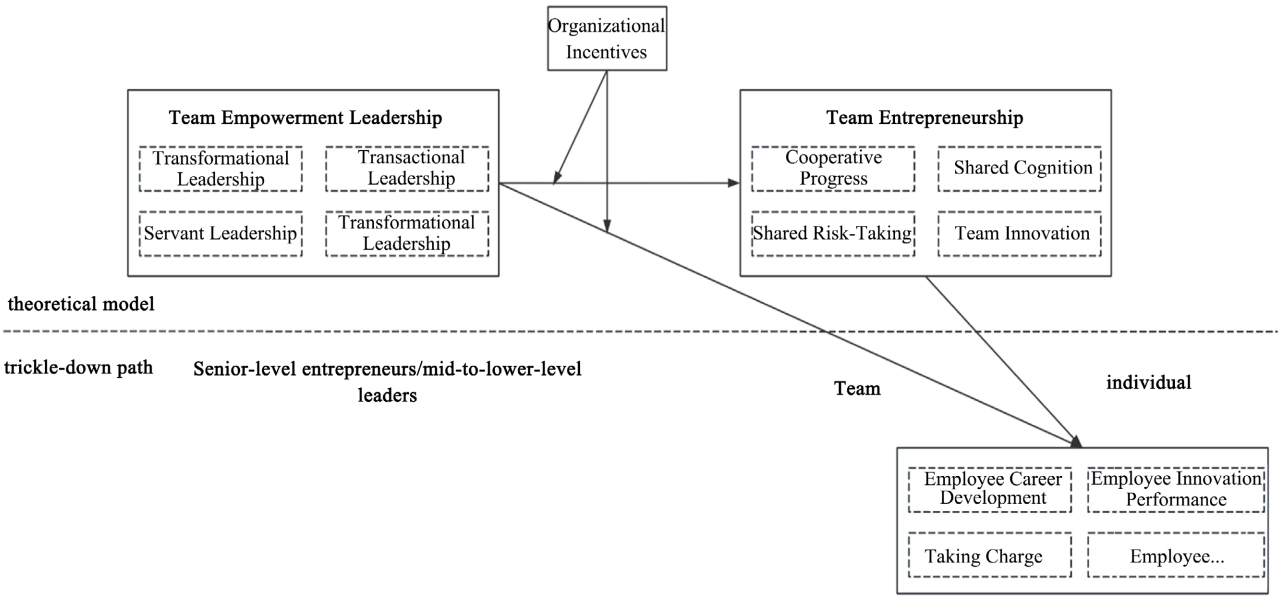

Figure 2. Conceptual model of the entrepreneurship emergence mechanism.

3.4. Policy System for Cultivating Entrepreneurship with Xi'an Characteristics from the Perspective of New Quality Productive Forces and High-Quality Development

Within the macro-strategic layout of advancing Chinese modernization, the deepening development of entrepreneurship cultivation in the western region holds significant regional strategic value. Although progress has been made in cultivating entrepreneurship in western China, a structural adaptation gap still exists relative to the national strategic goals. In view of this, based on a regional development theoretical framework, this study proposes constructing a policy system for cultivating entrepreneurship adapted to the western region's context:

Firstly, foster an innovation ecology through policy tool innovation, focusing on the synergistic development paths of characteristic advantage industries and emerging business forms, and promoting the industrial system's leap towards the high end of the value chain.

Secondly, leverage the advantages of higher education clusters in the west to build a trinity "university-industry-region" alumni economy ecological chain, achieving the regional transformation of intellectual capital.

Thirdly, establish cross-regional collaborative innovation platforms to facilitate in-depth dialogue between the western and developed regions in dimensions such as institutional innovation, business models, and technical standards, cultivating entrepreneurial capabilities that combine strategic acuity and local adaptability.

This study is grounded in the unique context of the western region where "late-development disadvantages and advantages coexist". It deeply analyzes the interaction mechanisms of factors such as geographical location, resource endowment, and policy evolution. Drawing on policy innovation paradigms from advanced regions like the Yangtze River Delta and Guangdong-Hong Kong-Macao, it constructs a policy design framework of "New Quality Productive Forces Cultivation - High-Quality Development Synergy". This aims to provide theoretical support and practical guidance for cultivating a new generation of entrepreneurs in the western region who possess global competitiveness, local embeddedness, digital empowerment characteristics, and green development concepts.

4. Challenges and Improvement Paths for Entrepreneurship to Enable the Generation of New Quality Productive Forces in Xi'an and Promote High-Quality Development

4.1. Challenges

Since the 18th National Congress of the Communist Party of China, the Party Central Committee with Comrade Xi Jinping at its core has attached great importance to the vital role of entrepreneurs and entrepreneurial spirit in national development. At the symposium on private enterprises, General Secretary Xi Jinping emphasized: "We must promote entrepreneurial spirit, focus wholeheartedly on strengthening, improving, and expanding enterprises, and remain steadfast builders of socialism with Chinese characteristics and promoters of modern-

ization with Chinese characteristics." Amidst the current complex and severe domestic and international competitive landscape, with increasing uncertainties in the international environment and the domestic economy undergoing a critical phase of transformation and upgrading, thoroughly studying and implementing the spirit of General Secretary Xi Jinping's important speech at the symposium on private enterprises and vigorously promoting the entrepreneurial spirit hold significant practical importance. For Xi'an, actively putting this spirit into practice and vigorously advancing the high-quality development of the private economy is a key pathway to achieving the goal of building a strong economic city in the west. As a hub for scientific and technological innovation in Northwest China, Xi'an possesses a solid foundation in three traditional industries: defense, education and science, and energy, playing a vital role in regional economic development. However, in the process of generating new quality productive forces, Xi'an still faces numerous bottlenecks and constraints. As the core driving force for high-quality economic development, new quality productive forces are characterized by revolutionary technological breakthroughs, innovative allocation of production factors, and deep industrial transformation and upgrading. Currently, Xi'an faces prominent issues in developing new quality productive forces, including low innovation conversion rates, rigid factor allocation, and lagging industrial upgrading. These problems hinder the city's progress toward high-quality economic development. The advancement of new quality productive forces urgently requires a powerful engine at the micro level to activate development momentum, with entrepreneurship serving as the core driving force. The qualities inherent in entrepreneurship—innovation, risk-taking, and dedication—provide the intrinsic motivation and directional guidance for generating new-quality productive forces.

Empowering the Generation of New-Quality Productive Forces in Xi'an to Drive High-Quality Development faces multiple challenges. First, insufficient innovation spirit leads to difficulties in transforming scientific and technological achievements. Although Xi'an possesses numerous top-tier military-industrial scientific and educational resources, granting it unique advantages in scientific research and innovation, the problem of low local conversion rates for scientific and technological achievements persists. According to data from the Xi'an Municipal Science and Technology Bureau, the city's technology contract transaction volume exceeded 380 billion yuan in 2023. However, a significant portion of these achievements are commercialized outside the city, indicating substantial room for improvement in local conversion rates. Many forward-looking and application-oriented scientific research outcomes remain "dormant in laboratories", failing to be promptly transformed into tangible productive forces. This results in the waste of scientific and technological resources and constrains the cultivation and development of new-quality productive forces. Second, constrained risk-taking spirit leads to rigid factor allocation. Incomplete intellectual property protection mechanisms expose entrepreneurs to substantial risks and uncertainties in long-term

investments across emerging sectors like the digital economy and green industries, dampening their confidence in such fields. This hinders the flow of production factors toward high-efficiency, high-value-added domains, obstructing industrial restructuring and the formation of new productive forces. Third, insufficient talent cultivation awareness stifles long-term growth momentum. Some entrepreneurs exhibit a tendency toward "short-term profit-seeking", resulting in severely inadequate investment in basic research and talent development. Although Xi'an has achieved notable success in talent recruitment—with over 100,000 master's and doctoral degree holders in the High-Tech Zone—the net outflow of high-end talent, particularly R & D personnel, to eastern coastal regions has not fundamentally reversed. This makes it difficult to foster an innovation culture and sense of social responsibility rooted in the west for long-term cultivation. Talent is the core element of innovation, and shortages or outflows directly impact corporate innovation capabilities and the development potential of new quality productive forces.

Xi'an faces multiple challenges in leveraging entrepreneurial spirit to empower new quality productive forces and drive high-quality development. Overcoming these hurdles hinges on institutional innovation to unleash entrepreneurs' innovative vitality and entrepreneurial passion, fully harnessing the core enabling role of entrepreneurial spirit in new quality productive forces to inject sustained momentum into Xi'an's high-quality economic development.

4.2. Improvement Pathways

Entrepreneurship can propel Xi'an's transformation from a "major science and education hub" to an "innovation powerhouse" through three pathways: innovation-driven development, resource allocation, and industrial transformation, thereby supporting high-quality development in western China. Under the national "dual circulation" strategy, Xi'an bears the mission of establishing itself as a "benchmark for new quality productive forces in the west", where nurturing and unleashing entrepreneurship is the key to success.

4.2.1. Strengthen Policy Support and Foster a Favorable Business Environment

A favorable business environment plays a crucial role in nurturing entrepreneurship in the western region. From the perspective of optimizing market mechanisms, the core essence of a favorable business environment lies in breaking down regional barriers and industry monopolies, and building a fair, orderly, open, and transparent market competition ecosystem. The city (including Xixian New Area) has 3,270,156 registered market entities, representing a year-on-year increase of 3.06%. Both locally rooted and incoming enterprises can compete under identical market rules and conditions. This rule-based, equitable environment eliminates competitive advantages derived from geography or origin, granting all market entities equal development opportunities. Such a fair competitive landscape profoundly shapes entrepreneurs' business philosophies and operational models. In

a level playing field, non-market factors are significantly diminished, compelling entrepreneurs to refocus on building their enterprises' core competitiveness. To stand out in fierce market competition, entrepreneurs must focus on enhancing product quality and service standards. Through continuous technological innovation, management optimization, and service upgrades, they meet consumers' increasingly diverse and personalized demands. A favorable business environment fosters a fair competitive ecosystem, inspiring Western entrepreneurs' dedication and integrity, thereby providing fertile ground for nurturing and developing the Western entrepreneurial spirit.

4.2.2. Strengthening Legal Safeguards to Protect Enterprise Rights

A sound legal environment effectively safeguards enterprises' legitimate rights and interests, including property rights and operational autonomy. Within a standardized and orderly legal framework, when enterprises face unlawful infringement of their rights, they can rely on a robust legal system and impartial judicial mechanisms to seek redress through legitimate and effective legal channels. In 2024, Xi'an courts accepted 476,500 cases of various types, concluding 422,700 cases—accounting for 41.11% of the province's total resolved cases. Cases pending for over 18 months were cleared entirely, while the reversal rate for first-instance judgments dropped to 2.42%, the lowest level in a decade. Whether through administrative litigation to oversee and correct improper interference by administrative agencies, or via civil litigation to assert rights and seek compensation from infringers, the law provides enterprises with clear and actionable pathways for rights protection. This comprehensive legal remedy mechanism ensures enterprises can promptly obtain fair adjudication and reasonable compensation when their rights are infringed, effectively safeguarding their legitimate interests. Simultaneously, this certainty in rights protection instills confidence in entrepreneurs for long-term investment, empowering them to allocate substantial resources to technological R & D, product innovation, and market expansion—thereby fostering their innovative and entrepreneurial spirit.

4.2.3. Fostering Talent Development to Provide Intellectual Support for Enterprises

Entrepreneurship serves as a vital force driving economic growth and social progress. In the process of generating new-quality productive forces and pursuing high-quality development, talent acts as the key vehicle and driving force for unleashing entrepreneurial potential. Xi'an has consistently prioritized talent cultivation and recruitment. Entrepreneurs integrate resources such as talent, technology, and capital to transform innovative concepts into tangible productive forces, thereby propelling the continuous emergence and high-quality development of new-quality productive forces. As the core human resource for technological innovation and the vital engine driving the generation of new quality productive forces through entrepreneurial spirit, talent plays an irreplaceable role in advancing high-quality development. Enterprises should prioritize talent cultivation and

recruitment, foster an enabling environment for talent development, and stimulate their innovative vitality and creativity. Concurrently, robust incentive mechanisms should be established to provide employees with ample growth opportunities and competitive benefits, thereby attracting and retaining top talent. Fully leveraging the potential of talent will propel technological innovation and the development of new quality productive forces, ultimately achieving high-quality economic growth.

4.2.4. Cultural Empowerment: Shaping an "Innovation-Driven" Urban Ethos

Increase recognition for outstanding entrepreneurs to establish role models for private sector leaders. Xi'an has officially established the "Xi'an Entrepreneurship Festival" to honor the entrepreneurial community in the city's name. Entrepreneurial spirit—encompassing innovation, risk-taking, dedication, and collaboration—serves as a vital engine for economic growth. Outstanding private entrepreneurs exemplify this ethos, their entrepreneurial journeys and success stories embodying its rich essence. By amplifying recognition for these leaders, their exemplary deeds and qualities can be widely disseminated, fostering a societal atmosphere that honors entrepreneurs, champions innovation, and encourages entrepreneurship. This cultural empowerment shapes a "science and technology innovation-oriented" urban spirit. As of April 2024, Xi'an has surpassed 15,000 high-tech enterprises and 19,000 science and technology-based SMEs, demonstrating robust innovative vitality. It is recommended to further strengthen the city's innovative cultural atmosphere through initiatives such as establishing the "Xi'an Science and Technology Innovation Week" and developing entrepreneurship education bases. This will address shortcomings in quality indicators like the number of high-value invention patents per 10,000 people, thereby comprehensively stimulating the entrepreneurship.

5. The Theoretical Significance and Practical Implications of Entrepreneurship Enabling the Generation of New Quality Productive Forces in Xi'an to Promote High-Quality Development

5.1. Theoretical Significance

5.1.1. Constructing a Comprehensive, Integrated, and Multi-Level Connotation of Entrepreneurship for the Era and Establishing an Evaluation Index System

A comprehensive and scientific understanding of entrepreneurship is the prerequisite for leveraging its role. Through practical research on numerous entrepreneurs in Xi'an, it helps in constructing an integrated, multi-level connotation of entrepreneurship for the era and its corresponding evaluation index system. For instance, regarding the innovative spirit, it can be measured from dimensions such as the proportion of enterprise R & D investment, the speed of new product launches, and the number of patent applications.

This evaluation index system can not only accurately assess the strength of entrepreneurship but also provide a solid theoretical basis for subsequent research, making the study of entrepreneurship more standardized and scientific. It facilitates comparative analysis across different regions and industries, providing clear direction for the cultivation and promotion of entrepreneurship.

5.1.2. Revealing the Mechanism Research on How Entrepreneurship Influences Major Issues Such as New Quality Productive Forces and High-Quality Development

In-depth exploration of the mechanism through which entrepreneurship affects major issues like new quality productive forces and high-quality development can enrich economic development theories. Taking new quality productive forces as an example, research finds that the innovative and adventurous spirit of entrepreneurs encourages enterprises to be the first to adopt new technologies and explore new markets, thereby promoting the formation and development of new quality productive forces. Their integrity and law-abiding spirit safeguard market order, creating a favorable environment for the healthy development of new quality productive forces. In terms of high-quality development, entrepreneurs optimize resource allocation and enhance enterprise management levels, achieving the unity of economic and social benefits for enterprises, and thus driving regional high-quality economic development. These research outcomes deepen the understanding of the inherent laws of economic development and provide a theoretical logic and practical path support for Xi'an and other regions to develop new quality productive forces and promote high-quality development by stimulating entrepreneurship.

5.1.3. Deepening Granular Research on the Emergence and Cultivation of Entrepreneurship

Xi'an's unique historical, cultural heritage, and economic development stage provide rich samples for studying the emergence and cultivation of entrepreneurship. Through tracking and analyzing the growth process of Xi'an entrepreneurs, it explores the emergence paths of entrepreneurship at different levels (individual, enterprise, regional). For example, at the individual level, how family background, educational experiences, and personal traits influence the formation of entrepreneurship; at the enterprise level, how factors such as corporate culture, organizational structure, and incentive mechanisms affect the inheritance and promotion of entrepreneurship; at the regional level, how policy environment, industrial atmosphere, and social culture shape entrepreneurship.

Simultaneously, deeply researching the impact of policies promoting Xi'an's high-quality development on the cultivation of entrepreneurship enhances the granular study of the inheritance of entrepreneurship. This provides valuable experience and theoretical reference for other regions to cultivate entrepreneurship and promote economic development, further enriching the theoretical research system related to entrepreneurship in the new era.

5.2. Practical Implications

5.2.1. Hierarchical Cultivation of Entrepreneurship: Promoting the Shift from "Individual Leadership" to "Collective Emergence"

To address the scarcity of entrepreneurial spirit and the insufficient atmosphere for innovation and entrepreneurship in Xi'an, a hierarchical and classified cultivation system must be constructed. For outstanding entrepreneurs, implement a "Pilot Program" that includes organizing inspections and study tours to advanced regions, inviting renowned domestic and international entrepreneurs to deliver lectures, and providing high-end management training to enhance their strategic vision and innovation capabilities, thereby leveraging their role as "leading geese". For small and medium-sized entrepreneurs, conduct empowerment training focused on practical topics such as innovative enterprise management and digital operations, while establishing a mutual aid alliance for small and medium-sized entrepreneurs to facilitate experience sharing and resource exchange. At the team level, introduce the concept of shared leadership, encouraging entrepreneurs to adopt empowering and transformational leadership styles to awaken team members' innovation awareness and sense of ownership. By establishing innovation incentive funds and carrying out internal entrepreneurship project incubations, team innovation vitality can be stimulated, achieving a trickle-down effect of entrepreneurship from top management to middle and grassroots levels, ultimately forming a pattern of collective emergence where "everyone can innovate and everyone can start a business".

To address the issue of "strong individuals but weak communities" in Xi'an's entrepreneurial ecosystem, a three-tier cultivation plan should be implemented. First, the Leading Entrepreneurs Navigation Program: Select top-tier entrepreneurs to visit Munich, Germany and Silicon Valley for technological industry ecosystem studies, enhancing their global vision and strategic thinking. Support these leaders in spearheading national major science and technology projects, such as the construction of the National Laboratory for Photovoltaic New Energy, to play a pioneering role. Second, the SME Entrepreneur Empowerment Program: Train 500 small and medium-sized entrepreneurs annually on themes like digital transformation, industrial upgrading, and market expansion. Activities include organizing visits to Xi'an Coal Machinery Factory for digital transformation learning, and connecting SMEs with university technological achievements through Qin Chuang Yuan. Third, the Startup Entrepreneur Incubation Program: Establish "Entrepreneurship Bootcamps" at universities like Xi'an University and Xidian University, inviting successful entrepreneurs as instructors to provide technical guidance, financing connections, and venue support. A seed fund will be set up to invest in projects aligned with new productive forces, nurturing entrepreneurial ventures.

5.2.2. Actively Promoting Industrial Transformation, Upgrading, and Cultivating Emerging Industries

Xi'an boasts a robust industrial foundation in manufacturing, yet faces challenges

in upgrading and transformation. Entrepreneurial spirit plays a pivotal role here, with innovative leaders boosting production efficiency and product quality through advanced manufacturing technologies and optimized workflows. The city encourages entrepreneurs to lead traditional enterprises in digital and green transformation, establishing subsidy funds to reward companies with significant improvement outcomes. In nurturing emerging industries like new energy and advanced materials, local authorities support business owners in leveraging sharp market insights to strategically position themselves, attracting high-end talent and capital investment.

5.2.3. Strengthening Regional Resource Integration and Transforming Government Roles

Xi'an, located at the heart of China's inland region, enjoys a strategic advantage in connecting the east and west and facilitating communication between the north and south. Entrepreneurs should be encouraged to broaden their international perspectives, integrate cross-regional resources, and actively participate in the Belt and Road Initiative to expand into international markets. In this process, the government should further strengthen its service functions, optimize the business environment, and provide convenience for enterprises cross-regional development. The government should transition from being a "manager" to a "service provider". First, promote precise policy services by establishing entrepreneur demand lists to address institutional issues, regularly collecting entrepreneurs' needs, and introducing targeted policies accordingly. Second, enhance the efficiency of government services by implementing measures such as completing business registration within one day to improve satisfaction with enterprise-related government services. Third, build an innovation ecosystem of government-enterprise collaboration. Hold quarterly entrepreneur symposiums to gather opinions and suggestions, establish mechanisms for entrepreneurs to participate in policy formulation, ensure policies align with enterprises' actual needs, and foster a favorable pattern of coordinated government-enterprise efforts to jointly promote high-quality development.

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