Original Research Article

Research on the high-quality development path of strategic emerging industries in Foshan

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Abstract: Strategic emerging industries serve as the core driving force propelling future economic and social progress. As a pivotal manufacturing hub within the Greater Bay Area, Foshan bears the critical responsibility of transitioning from a "major traditional manufacturing city" into a "powerful city of technological innovation." Employing a three-dimensional analytical framework, encompassing technology, industrial clusters, and policy. This paper meticulously examines the "three highs and three lows" challenges encountered by Foshan's strategic emerging industries on their path toward high-quality development. Furthermore, drawing upon exemplary domestic and international practices, it proposes a collaborative innovation strategy centered on "chain-leader leadership, scenario expansion, and financial empowerment," alongside a dynamic pathway for policy support.

Keywords: emerging industries; manufacturing; high-quality development; digital transformation; green transformation

1. Introduction

The report of the 20th National Congress of the Communist Party of China emphasizes that fostering the high-quality development of strategic emerging industries serves as a critical pillar in constructing a modern socialist industrial system. Against the backdrop of intensifying global technological competition and the domestic "dual circulation" development paradigm, strategic emerging industries have emerged as core pillars for safeguarding national economic and industrial security. As a major manufacturing hub in China, Foshan possesses a deep-rooted manufacturing foundation. However, amidst the sweeping tides of digitalization and low-carbon transition, the question of how Foshan can break free from traditional path dependencies to achieve breakthrough development in strategic emerging industries is not only vital for the long-term growth of the local economy but also offers practical insights for industrial synergy within the Guangdong-Hong Kong-Macao Greater Bay Area[1].

Based on the evolutionary characteristics of the Technology-Organization-Environment (TOE) framework, this paper constructs a dynamic analytical framework encompassing three dimensions: technology, industrial clusters, and policy. Employing analytical tools such as field surveys and coupling coordination models, this study aims to establish a closed-loop research process comprising "status quo analysis—problem identification—countermeasure formulation."

2. Current status

Since the State Council issued the <Decision on Accelerating the Cultivation and Development of Strategic Emerging Industries> in 2010, both national and local governments have intensively promulgated relevant policies. Guangdong Province subsequently released the <Opinions on Cultivating and Developing Strategic Pillar Industry Clusters and Strategic Emerging Industry Clusters>, as well as specific action plans for sectors such as semiconductors and integrated circuits, thereby defining an industrial landscape centered on Guangzhou, Shenzhen, and Zhuhai that drives the coordinated development of surrounding cities, including Foshan. In 2020, Foshan also issued the <Implementation Opinions on Cultivating and Developing "2+2+4" Industry Clusters>, placing a specific focus on strategic emerging industries.

Existing research tends to concentrate primarily on single dimensions, such as technological innovation

or policy evaluation[2,3]. This project innovatively introduces Complex Adaptive Systems (CAS) theory to quantitatively assess the supportive effects of traditional "manufacturing genes" on emerging industries, and to explore the nonlinear evolutionary mechanisms of resource-based, value-based, and capability-based perspectives within the context of industrial upgrading[4].

3. Problems in the development of strategic emerging industries in Foshan city

A preliminary assessment of industries in Foshan, including smart home appliances, high-end equipment manufacturing, and hydrogen energy, reveals that they are currently facing a classic "three highs, three lows" dilemma:

3.1. Technical dimension: The coexistence of high output value and low added value

Although the output value of Foshan's strategic emerging industries has reached a substantial scale, demonstrating robust growth momentum and immense economic potential, the sector remains highly dependent on external sources for critical inputs such as core raw materials, key equipment, and foundational software. This reliance on external entities exposes industrial development to numerous uncertainties and risks; furthermore, distinct bottleneck technical challenges persist in several critical domains, severely constraining the industry's further expansion and its capacity for independent, self-controlled development[5].

3.2. Cluster dimensions: High cluster density and low collaborative intensity

Foshan has gradually established a number of distinctive industrial clusters, bringing together a multitude of related enterprises. However, closer examination reveals that, for the most part, these companies are merely situated in physical proximity to one another, simply co-located within the same geographical area. In terms of actual operations and development, they lack a deep-seated ecosystem for technical collaboration; cooperation among these enterprises, particularly regarding technical exchange, resource sharing, and collaborative innovation, remains woefully insufficient. Consequently, the overall resilience of the industrial chain still requires significant strengthening to better withstand various challenges—Such as market volatility and technological shifts, and to ultimately achieve sustainable industrial development and a comprehensive enhancement of competitiveness.

3.3. Policy dimension: High cluster density and low collaborative intensity

In the process of their concrete implementation, the policies currently in force in Foshan City exhibit a fragmented character. This fragmentation, while not halting the ongoing advancement of intellectual property protection efforts, implies that the results ultimately achieved still leave room for improvement when measured against their intended objectives. Furthermore, within the various stages of policy formulation and implementation, there is a notable absence of simulation tools, akin to a policy sandbox, capable of dynamically modeling the potential outcomes of policy implementation. The lack of such tools makes it difficult for policy provisions to align precisely with the actual needs of enterprises; this resulting misalignment between policy supply and corporate demand, to a certain extent, hinders the realization of overall policy efficacy and the cultivation of a favorable environment for business development.

4. New pathways for the development of strategic emerging industries in Foshan city

To address the aforementioned issues, this study proposes a collaborative innovation framework characterized by supply chain leader-driven traction, scenario openness, and financial empowerment.

4.1. Technology innovation-driven path

Foshan City can implement targeted, one-on-one support initiatives for key enterprises within the region. This support extends beyond mere financial assistance to encompass multifaceted aid, including policy guidance and resource matchmaking, thereby empowering these enterprises to achieve significant breakthroughs in their respective core technological domains. Through this approach, companies are better equipped to resolve critical technical bottlenecks that have long constrained their growth, thereby laying a solid foundation for the advancement of the entire industry. Concurrently, Foshan City fully leverages modern technological tools,

such as artificial intelligence and big data, to optimize corporate R&D processes. By harnessing the power of intelligent technologies, companies can not only drastically shorten R&D cycles but also effectively boost innovation efficiency, thereby securing a more advantageous position amidst fierce market competition.

Furthermore, Foshan City places great emphasis on fostering the development of innovation alliances, encouraging deep collaboration between enterprises, universities, and research institutions to cultivate a robust ecosystem that tightly integrates industry, academia, and research. This collaborative model facilitates the accelerated commercialization of technological achievements, ensuring that theoretical research is more rapidly translated into practical production applications. Simultaneously, Foshan actively takes the lead in establishing industry-specific innovation alliances; by integrating upstream and downstream resources and strengthening internal collaboration across the industrial chain, the city further enhances the overall competitiveness of local enterprises within global supply chains, enabling them to demonstrate greater strength and capability on the international stage.

4.2. Pathways for industrial cluster upgrading

Foshan City should go all out to optimize and refine its "First Purchase, First Use" policy, leveraging it as a powerful catalyst to assist enterprises in expanding into both domestic and international markets. Specifically, this entails further refining and implementing relevant policy provisions to provide enterprises with clearer and more robust support, thereby ensuring a smoother and more seamless entry into these markets. Furthermore, to accelerate the speed at which products reach the market, it is essential for Foshan to establish a dedicated Green Channel. This channel would streamline approval processes and enhance administrative efficiency, enabling enterprises to launch their products with maximum speed and seize first-mover advantages.

In addition, Foshan should devote significant effort to building platforms for international cooperation, specifically, by constructing high-caliber platforms for international industrial collaboration. Through such platforms, the city can actively facilitate linkages and partnerships between local Foshan enterprises and leading global companies. This not only enables local enterprises to learn from and adopt advanced international practices and technologies but also enhances their core competitiveness, thereby securing a more advantageous position within the global industrial value chain.

Moreover, the introduction of Industrial Internet platforms constitutes another crucial initiative. By harnessing the power of Industrial Internet platforms, the city can effectively drive the digital transformation of its industrial clusters. Through this process, enterprises can more effectively share resources, engage in collaborative innovation, and boost their overall production efficiency and market responsiveness. Furthermore, to ensure sustainable development, Foshan must establish green manufacturing standards. These standards will set clear requirements regarding environmental protection and resource utilization efficiency during the production process, compelling enterprises to fulfill their social responsibility of environmental stewardship while simultaneously pursuing economic gains, thereby achieving a harmonious balance between economic, social, and environmental development.

4.3. Dynamic policy safeguard mechanism

Foshan City could consider establishing a dedicated digital platform for policy simulation. Operating within a specialized environment, akin to a policy sandbox, this platform would utilize dynamic simulation tools to conduct its operations. Through these tools, detailed modeling would be performed to analyze the potential outcomes of policy implementation, as well as the various scenarios associated with potential circuit-breaker mechanisms. This modeling process would facilitate the gradual establishment of a robust set of policy circuit-breaker mechanisms, alongside a corresponding dynamic adjustment system, thereby ensuring that policies can adapt promptly and effectively to actual conditions during their implementation.

Concurrently, a guidance fund specifically targeting strategic emerging industries should be established. The objective of this fund is to vigorously promote innovation activities within the realm of technology finance. Specifically, it aims to actively foster the development of intellectual property (IP) financing services and advance initiatives related to technology insurance. By doing so, the fund can significantly mitigate the risks enterprises face when engaging in innovation activities, thereby alleviating their concerns, and encourage them to invest more proactively in critical endeavors such as research and development (R&D).

Furthermore, there is a need to construct a comprehensive service platform. This platform should encompass a multifaceted array of functions: testing and inspection services, providing accurate and reliable assessments for various products and services; intellectual property services, offering enterprises comprehensive support regarding IP application, maintenance, and commercialization; and financial matchmaking services, facilitating the establishment of effective communication and cooperation channels between enterprises and financial institutions. By integrating these diverse services into a single comprehensive platform, Foshan can comprehensively enhance the sophistication of its industrial support ecosystem. This would significantly bolster the city's competitiveness, both regionally and nationally, enabling its industrial development to continuously achieve new breakthroughs and advancements within a favorable ecological environment.

5. Conclusions

This study conducts a systematic diagnosis of Foshan's strategic emerging industries, establishing a closed-loop research framework comprising "diagnosis, verification, and optimization." Through the application of a policy alignment index and a supply chain resilience measurement model, Foshan is poised to construct internationally competitive clusters of strategic emerging industries within the Guangdong-Hong Kong-Macao Greater Bay Area. By implementing dynamic safeguard mechanisms and collaborative innovation pathways, Foshan's strategic emerging industries are set to achieve a transformative leap, shifting from mere scale expansion to value enhancement, thereby contributing invaluable Foshan experience to the coordinated regional economic development of the entire nation.

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