

Research on the Development Path of New-Quality Productive Forces in Dongguan City

Yuxuan Yang, Xiaoqian Yang

Guangdong University of Science and Technology, Dongguan, Guangdong, 523000, China

ABSTRACT

With the intensification of global industrial competition and the ongoing transformation and upgrading of the manufacturing sector, new-quality productive forces have emerged as the core driving force of high-quality economic development. Taking Dongguan City as the research subject, this paper examines the key challenges in its development of new-quality productive forces. First, insufficient investment in research and development (R&D) constrains enterprises in technological innovation, product upgrading, and the shaping of core competitiveness, thereby impeding the optimal allocation of innovation resources and slowing down industrial upgrading. Second, the limited number and small scale of high-tech enterprises weaken both the cluster effects of industries and competitiveness in high-end segments of industrial chains, restricting the formation of a regional innovation ecosystem. Third, Dongguan's limited attractiveness to high-level talent, coupled with inadequate local training capacity, creates shortages in top-tier scientific resources, leading talents, and innovation teams. To address these issues, this study proposes targeted strategies: (1) increasing R&D investment and improving innovation-driven mechanisms; (2) expanding the number and scale of high-tech enterprises to enhance industrial clustering and competitiveness; (3) optimizing talent policies and strengthening research platforms to attract and cultivate high-level talent.

KEYWORDS

New-quality productive forces; High-tech enterprises; R&D investment; Talent strategy

1 Research background

The Chinese Government identified the cultivation of new-quality productive forces as the primary task for achieving high-quality economic development, clearly pointing out the need to “improve institutional mechanisms for region-specific development of new-quality productive forces.” The policy directions not only provide strategic guidance for local governments and industries but also open clear research avenues for academia in exploring the pathways of developing new-quality productive forces.

As an important manufacturing base in the Pearl River Delta, Dongguan enjoys notable advantages in industrial systems and manufacturing foundations. Nevertheless, significant challenges remain in its pursuit of new-quality productive forces. Specifically, R&D investment is relatively insufficient; the number and scale of high-tech enterprises are limited; and the city's attractiveness to top-tier talent and capacity for local talent cultivation are inadequate. These issues restrict Dongguan's capacity for breakthroughs in core technologies, industrial upgrading, and regional competitiveness, posing potential risks to its role in the national framework of new-quality productive forces.

Under this context, a systematic study on Dongguan's development path of new-quality productive forces holds great practical significance. On one hand, it can provide decision-making references for local governments in terms of R&D allocation, industrial layout, and talent policies, thereby promoting high-quality development of advanced manufacturing. On the other, it may shed light on the collaborative mechanisms among industrial restructuring, innovation capacity enhancement, and talent support during regional economic transformation, offering valuable lessons for the cultivation of new-quality productive forces nationwide.

2 Literature review

2.1 Research on the core connotation of new-quality productive forces

Scholars generally agree that the essence of new-quality productive forces lies in technological innovation and digital transformation. Chen Xiaofeng (2022) argued that technological innovation and the application of information technologies are key driving factors for the formation of new-quality productive forces. Ren Baoping and Wang Ziyue (2023) further emphasized the decisive role of innovation elements in developing new-quality productive forces, as they not only determine improvements in production efficiency but also directly influence industrial restructuring and economic development quality.

Similarly, Wang Shubin, Hou Bowen, and Li Yanzhao (2025) proposed that new-quality productive forces embody a fundamental transformation in the growth model, shifting away from reliance on traditional resources and low-value-added industries toward emerging industries, technological innovation, and core competitiveness. Zhang Zhenyu and

Hou Guanyu (2024) highlighted disruptive and frontier technologies as vital supports for new-quality productive forces and as the driving engines for industrial innovation and structural upgrading.

In addition, Zhou Wen and Xu Lingyun (2023) stressed that new-quality productive forces are not merely optimizations or improvements of existing forces; instead, they signify a fundamental restructuring of productivity. At their core lies technological innovation and industrial revolution, which transform traditional production systems through new elements and conditions, thereby giving rise to new industrial forms and economic momentum.

2.2 Research on the development path of new-quality productive forces

In terms of development pathways, scholars commonly stress the dual drivers of technology and talent. Sun Rui (2024) argued that the advancement of new-quality productive forces requires talent leadership, calling for a virtuous cycle of education, science, and talent. He emphasized nurturing strategically needed professionals while reforming talent systems in key areas.

Huang Qunhui and Sheng Fangfu (2024) also underscored the central role of technological innovation, suggesting that frontier technology drives qualitative shifts in productivity, enabling the transition from traditional forms to high-tech, high-efficiency, and high-value-added new-quality productive forces.

Overall, existing research reveals that the development of new-quality productive forces depends not only on technological and digital drivers but also on high-level talent and innovation policies. Multi-element collaboration is necessary to achieve industrial upgrading and high-quality economic development.

3 Shortcomings in the development of new-quality productive forces in dongguan

3.1 Insufficient r&d investment

From the perspective of developing new-quality productive forces, R&D investment is a crucial driver for upgrading advanced manufacturing and sustaining regional competitiveness. However, according to the 2024 statistical yearbooks of Dongguan and Guangzhou, Dongguan still lags behind in this regard. In 2023, R&D expenditures of large-scale industrial enterprises in Guangzhou reached 4,503,821.8 million yuan, whereas Dongguan's figure was only 3,958,647 million yuan during the same period, reflecting a considerable gap.

This disparity indicates that although Dongguan, as an important manufacturing base in the Pearl River Delta, enjoys a solid industrial foundation, its overall R&D expenditure and intensity remain weaker than those of neighboring first-tier cities.

The direct consequence of insufficient R&D investment is that enterprises face restrictions in technological innovation, product upgrading, and the cultivation of core competitiveness. On one hand, limited funding reduces the capacity for basic research and frontier technological breakthroughs, making it difficult to support large-scale, long-term projects. On the other hand, inadequate investment also hampers the attraction and retention of high-end talent, resulting in suboptimal allocation of innovation resources and weaker control over high-value segments of industrial chains.

Furthermore, insufficient R&D investment reduces the efficiency of transforming innovation outcomes, slows down the pace of industrial upgrading, and undermines Dongguan's overall position in the national system of new-quality productive forces.

In essence, Dongguan's lag in R&D investment reflects not only financial shortcomings but also weaknesses in industrial policy orientation, corporate innovation awareness, and mechanisms for industry – university – research collaboration. Unless R&D intensity is significantly enhanced and resource allocation optimized, Dongguan risks losing its first-mover advantages amid fierce regional competition and global industrial changes. This would be detrimental to its pursuit of high-quality development in advanced manufacturing. Therefore, Dongguan urgently needs to expand R&D investment and improve innovation-driven mechanisms to strengthen the endogenous momentum of new-quality productive forces.

3.2 Limited number and scale of high-tech enterprises

High-tech enterprises are central actors in developing new-quality productive forces and vital supports for enhancing regional innovation capability and industrial competitiveness. Based on the 2024 statistical yearbooks of Dongguan and Guangzhou, Dongguan still faces limitations in both the number and scale of its high-tech enterprises. In 2023, Dongguan had around 10,100 high-tech enterprises, with a total industrial output value of 1,400.85 billion yuan. In contrast, Guangzhou had about 13,000 such enterprises, generating an output value as high as 1,675.906 billion yuan.

This comparison highlights Dongguan's weaker performance in high-tech industrial development relative to its neighbor.

From the perspective of enterprise numbers, although Dongguan possesses a strong manufacturing base, the total number of high-tech enterprises remains relatively insufficient. This suggests that Dongguan is still in the transition stage

from traditional manufacturing to high-tech manufacturing. The limited number of enterprises not only constrains the vitality of the local innovation ecosystem but also weakens the formation of industrial cluster effects. By contrast, Guangzhou benefits from a more favorable policy environment, stronger talent resources, and better access to research institutions, which enables it to attract and incubate more high-tech enterprises, thereby achieving larger and more competitive industrial clusters.

From the perspective of industrial scale, the total industrial output of Dongguan's high-tech enterprises is still markedly lower than that of Guangzhou. This reveals not only the lower overall economic contribution of high-tech enterprises in Dongguan but also its insufficient capacity in high-end segments of industrial chains and in key technology breakthroughs. Smaller industrial scale limits Dongguan's bargaining power in the global value chain, increasing its vulnerability to low value-added positions and hindering the formation of sustainable technological advantages.

In summary, the insufficient number and limited scale of high-tech enterprises in Dongguan result from delayed R&D investment, weak talent inflows, and insufficient conversion of technological achievements, combined with constraints in industrial support policies. Unless the number and scale of high-tech enterprises are expanded effectively, Dongguan risks being marginalized further in regional competition, which would weaken its capacity to cultivate new-quality productive forces and achieve high-quality development of advanced manufacturing. Therefore, stronger policy support, platform building, and industry – university – research collaboration are needed to accelerate enterprise growth and industrial expansion.

3.3 Weak attractiveness and local training capacity for high-level talent

In the formation of new-quality productive forces, high-level talent represents the most critical strategic resource. Elite professionals not only serve as direct drivers of technological innovation but also act as leaders of industrial upgrading and guarantors of urban competitiveness. Although Dongguan has introduced a series of talent policies and made efforts to improve its talent development environment in recent years, it still faces disadvantages compared with first-tier cities such as Guangzhou in attracting top global scientists, leading technologists, and outstanding young researchers.

From the perspective of external attractiveness, Dongguan lags behind in comprehensive urban services, research platform construction, and higher education resources. Guangzhou, for instance, not only provides better public services and a higher level of internationalization but also enjoys stronger advantages in terms of top research platforms and high-ranking universities. Institutions such as Sun Yat-sen University and South China University of Technology continuously provide Guangzhou with abundant research outcomes and a steady supply of highly trained talent. In contrast, Dongguan has fewer research platforms, lower-ranked universities, and weaker international environments, reducing its appeal in global talent competition.

From the perspective of local training capacity, Dongguan lacks sufficient high-level universities and research institutes, resulting in shortages in cultivating and supplying advanced talent. Its local education system still needs significant improvement in terms of discipline construction, research capabilities, and depth of industry – academia – research integration, which limits its ability to meet the long-term demand for frontier technological innovation. Consequently, enterprises in Dongguan depend heavily on external talent for core technological R&D and high-end manufacturing, while lacking a sustainable, endogenous momentum for talent development.

The inadequacies in attracting and cultivating high-level talent have become a critical bottleneck in Dongguan's development of new-quality productive forces. Without addressing the shortcomings in research platforms, higher education resources, and talent ecosystems, the city will find it difficult to establish continuous innovation advantages and industrial leadership in regional competition. Therefore, it is urgent for Dongguan to accelerate the building of high-level universities and research platforms, improve urban service systems, and create an internationalized environment for talent development. Only in this way can it strengthen its ability to both attract global talent and cultivate local professionals, thereby laying a solid foundation for the advancement of new-quality productive forces.

4 Development path of new-quality productive forces in dongguan

4.1 Increasing r&d investment

Dongguan must act simultaneously on financial support, policy guidance, and institutional innovation to establish a sustainable and steadily growing mechanism for R&D investment, thereby strengthening the endogenous momentum of new-quality productive forces.

First, the government should expand its guiding role in R&D investment. Special funds can be established to support frontier technology research, basic research, and breakthroughs in critical core technologies. Fiscal subsidies, tax incentives, and loan-interest discounts should be used to reduce enterprise R&D costs and encourage continuous investment. Particular emphasis should be placed on strategic emerging industries such as high-end equipment

manufacturing, new materials, and artificial intelligence, so that a diversified investment pattern combining government guidance with market demand can be formed.

Second, enterprises must become the main actors of R&D investment. They should enhance their awareness of innovation and treat R&D spending as a key step in shaping core competitiveness, establishing long-term mechanisms for sustained input. Government authorities may guide enterprises by adopting R&D intensity (the proportion of R&D spending to revenue) as an evaluation indicator, thus encouraging firms to raise their investment levels. At the same time, enterprises should be supported in building corporate research institutes, technology centers, and key laboratories, integrating R&D more deeply with product development and strengthening the industrialization of technological achievements.

Third, it is vital to improve industry – university – research collaboration. Dongguan should actively promote the establishment of joint R&D platforms between local enterprises and universities or research institutes, sharing research facilities and talent resources to enhance the efficiency of converting research results into applications. Introducing high-level domestic and international research teams and fostering international scientific cooperation will also strengthen the foresight and openness of R&D activities, thereby compensating for Dongguan's relative shortage of high-end research resources.

Finally, optimizing the structure of R&D investment is equally important. While expanding total investment, attention should be paid to balancing basic and applied research as well as short-term benefits and long-term strategic goals, avoiding excessive concentration in low-level repetitive projects. A more balanced allocation can enhance Dongguan's influence in frontier technologies and provide continuous technological support for the high-quality development of advanced manufacturing.

Through multi-level policy design and institutional innovation, Dongguan can gradually expand the scale and efficiency of its R&D investment, forming an innovation system characterized by enterprises as the main body, government as the guide, and deep integration of industry – academia – research collaboration, thereby boosting competitiveness in the development of new-quality productive forces.

4.2 Expanding the number and scale of high-tech enterprises

Dongguan should promote the rapid growth of high-tech enterprises and expand industrial scale from the perspectives of policy support, platform construction, industrial upgrading, and collaborative innovation, thereby strengthening its competitiveness in the system of new-quality productive forces.

First, policy support must be reinforced to optimize the business environment. The government should design targeted industrial policies to support transformation toward high-tech fields, offering tax incentives, R&D subsidies, and venture funds to encourage small and medium-sized enterprises (SMEs) to innovate. At the same time, intellectual property rights protection should be improved to enhance enterprises' enthusiasm for innovation and the commercialization of R&D outcomes, thus fostering a fair and transparent market environment.

Second, efforts should be made to accelerate the construction of innovation platforms to support enterprise incubation and growth. Dongguan can leverage existing industrial and science parks to build high-level incubators, accelerators, and public R&D platforms. These platforms should provide startups with research facilities, financial assistance, and professional services. By creating integrated platforms that combine government, industry, academia, research, and application, Dongguan can strengthen enterprises' abilities to make technological breakthroughs and commercialize results, while promoting the concentration and sharing of innovation resources.

Third, cluster-based and high-end industrial development should be advanced. Dongguan should fully exploit its manufacturing base and focus on strategic emerging industries such as electronics, new materials, biomedicine, and intelligent equipment to build several high-tech industrial clusters. The development of leading enterprises should be prioritized, enabling them to drive upstream and downstream firms toward collaborative innovation and industrial expansion, thereby enhancing the competitiveness and value-added levels of entire industrial chains. Moreover, enterprises should be supported in accelerating internationalization, integrating into global high-end value chains, and extending the reach of high-tech industries.

Finally, deeper integration of industry–university–research cooperation must be promoted. Local enterprises should be encouraged to build long-term partnerships with top domestic and international universities and research institutions. Establishing joint laboratories and industrial technology research institutes will allow research findings to be rapidly applied to production. Introducing advanced research resources and leveraging them to support local enterprises will enhance both innovation capacity and economies of scale.

In sum, the expansion of high-tech enterprises in number and scale requires joint efforts in policy incentives, innovation platform building, industrial clustering, and industry – academia – research integration. This will allow Dongguan to consolidate and upgrade its strategic position in regional and global competition, while fostering new-quality productive forces.

4.3 Strengthening high-level talent attraction and local training capacity

High-level talent constitutes the core element for developing new-quality productive forces, directly shaping a city's level of technological innovation and industrial competitiveness. Dongguan must enhance the effectiveness of its talent strategy by improving policy systems, upgrading supporting services, building research platforms, and strengthening its education system.

First, talent introduction policies should be further improved. Tailored measures should be developed to attract top global scientists, leading technologists, and outstanding young researchers. Examples include offering strong financial support for scientific research, providing free exploration space, and optimizing supporting services in housing, healthcare, and education for children. By creating a more international, livable, and work-friendly environment, Dongguan can raise its competitiveness in the regional and global talent market.

Second, high-level research platforms and innovation carriers must be built at a faster pace. Leveraging its manufacturing advantages, Dongguan should prioritize the construction of national and provincial key laboratories, engineering technology centers, and industrial innovation platforms to provide arenas where high-level talent can demonstrate their expertise. Raising the level of research platforms can strengthen talent cohesion and create a virtuous cycle of "talent–technology–industry."

Third, the cultivation of local talent needs to be improved. Dongguan should accelerate the establishment and expansion of high-level universities and vocational colleges, with an emphasis on disciplines closely related to advanced manufacturing and emerging industries. By upgrading the quality of educational resources and promoting deeper school–enterprise cooperation, enterprises can participate actively in training processes, strengthening practical components and increasing the applicability of talent cultivation. Over time, this will foster a stable supply of locally trained high-end professionals.

Finally, an open and inclusive talent ecosystem should be created. Dongguan must encourage international cooperation and exchanges, absorbing advanced research concepts and talent management models. Cross-regional mobility of researchers and resource sharing should be facilitated. At the same time, a social atmosphere that values talent and stimulates innovation should be nurtured through incentive systems, honorary titles, and performance evaluation mechanisms. Such efforts can enhance the sense of belonging and motivation for long-term development among high-level talent.

Through these comprehensive measures, Dongguan can increase its attractiveness to global talent while simultaneously building stronger local training capabilities. This will provide solid human capital support for the development of new-quality productive forces.

Funding

This paper is a research outcome of the 2024 Guangdong University of Science and Technology School-Level Scientific Research Project: Research on the Development Strategies of New-Quality Productive Forces in Dongguan (NO: GKY-2024KYYBW-20)

About the Author

1. Yuxuan Yang is an undergraduate student whose research interests focus on public policy.
2. Xiaoqian Yang is a postgraduate and lecturer with research interests in public policy.

References

- [1] Chen X. (2022). The impact of digital economy development on the upgrading of China's manufacturing industry: An empirical study based on provincial panel data. *Journal of Nantong University (Social Sciences Edition)*, 38(3), 128–140.
- [2] Ren B., & Wang Z. (2023). The logic and pathway of digital new-quality productive forces in promoting high-quality economic development. *Journal of Xiangtan University (Philosophy and Social Sciences Edition)*, 47(6), 23–30.
- [3] Wang S., Hou B., & Li Y. (2025). Mechanisms of elements, innovation logic, and path breakthroughs of new-quality productive forces: A systems theory perspective. *Contemporary Economic Science*, 47(1), 120–133.
- [4] Zhang Z., & Hou G. (2024). The historical logic, theoretical logic, and practical pathway of new-quality productive forces empowering Chinese modernization. *Contemporary Economic Management*, 46(6), 20–29.
- [5] Zhou W., & Xu L. (2023). On new-quality productive forces: Connotations, characteristics, and key focal points. *Reform*, (10), 1–13.
- [6] Sun R. (2024). Providing talent leadership support for the development of new-quality productive forces. *People's Tribune*, (6), 26–30.
- [7] Huang Q., & Sheng F. (2024). The system of new-quality productive forces: Elemental traits, structural carriers, and functional orientations. *Social Sciences Digest*, (5), 88–90.