

# Collaborative Linkages Among Universities, Industry, and Research: Empowering Enterprises in Free Trade Zones for High-Quality Advancement

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**Abstract:** Against the backdrop of current economic globalization and regional economic integration, the construction of pilot free trade zones and free trade ports has become an important strategic measure for China to promote high-quality economic development and enhance international competitiveness. As an important base for knowledge innovation and talent cultivation, universities can provide strong intellectual support and technical support for the high-quality development of free trade zones and free trade port enterprises through industry university research cooperation. This article delves into the significance of university industry academia research cooperation for the high-quality development of enterprises in pilot free trade zones and free trade ports, analyzes the current problems, and proposes forward-looking, targeted, and actionable countermeasures and suggestions.

**Keywords:** Universities; Industry academia research; Pilot free trade zones; Free trade ports; High-quality development

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## 1. Introduction

With the continuous deepening of China's reform and opening up, the construction pace of pilot free trade zones and free trade ports has accelerated. These regions are characterized by trade liberalization, investment facilitation, and financial internationalization, aiming to create special economic functional zones with international competitiveness. In this process, as the main body of economic activities, the high-quality development of enterprises is crucial <sup>[1]</sup>. As a bridge connecting universities, research institutions, and enterprises, university-industry research cooperation can fully leverage the advantages of all parties, promote knowledge innovation, technology transfer, and talent cultivation, and provide strong support for the high-quality development of enterprises in pilot-free trade zones and free trade ports <sup>[2]</sup>.

## **2. The significance of industry-university research cooperation for the high-quality development of enterprises in pilot free trade zones and free trade ports**

### **2.1. Promote technological innovation**

Universities have abundant scientific research resources and excellent scientific research talents. Through industry-university research cooperation, the scientific research achievements of universities can be transformed into actual productivity of enterprises, promoting technological innovation and product upgrading of enterprises. In pilot free trade zones and free trade ports, enterprises are facing fierce international competition. Only by continuously innovating in technology can they improve their core competitiveness. For example, research teams from universities can collaborate with enterprises to conduct cutting-edge technology research, develop new products with independent intellectual property rights, and gain competitive advantages for enterprises in the international market<sup>[3]</sup>.

### **2.2. Cultivate high-quality talents**

Universities are important bases for talent cultivation, and through industry-university research cooperation, they can cultivate high-quality talents with practical abilities and innovative spirit for enterprises. In pilot-free trade zones and free trade ports, enterprises have a more diversified and specialized demand for talents, requiring both technical talents with solid professional knowledge and management talents with international perspectives and cross-cultural communication abilities. Universities can adjust their talent development plans, offer relevant courses and practical activities according to the needs of enterprises, and provide talents that meet their development needs. At the same time, enterprises can also provide internship and employment opportunities for college students, allowing them to exercise their abilities in practice and improve their competitiveness in employment.

### **2.3. Promote industrial upgrading**

The cooperation between industry, academia, and research in universities can promote the industrial upgrading of pilot free trade zones and free trade ports. Through cooperation between universities and enterprises, the scientific research achievements of universities can be applied to traditional industries, promoting the transformation and upgrading of traditional industries. At the same time, it can also cultivate emerging industries and inject new impetus into the development of the regional economy. For example, in pilot-free trade zones and free trade ports, cooperation between universities and enterprises in fields such as intelligent manufacturing, biomedicine, and new energy can promote the development of these emerging industries and improve the overall level of regional industries.

### **2.4. Enhance the competitiveness of enterprises**

University-industry research cooperation can help enterprises improve their competitiveness. Through cooperation with universities, enterprises can gain advanced technology and management experience, and improve production efficiency and product quality. At the same time, the brand and reputation of universities can also be leveraged to enhance the image and market recognition of enterprises. In pilot free trade zones and free trade ports, enterprises face fierce competition from both domestic and international sources. Only by continuously improving their competitiveness can they stand undefeated in the market.

### **3. Problems in promoting high-quality development of enterprises in pilot free trade zones and free trade ports**

#### **3.1. The cooperation mechanism is not perfect**

At present, the mechanism of industry-university research cooperation is not yet perfect, lacking effective communication and coordination mechanisms as well as benefit distribution mechanisms. In the process of cooperation, there are often problems such as information asymmetry and poor communication between universities, research institutions, and enterprises, leading to low cooperation efficiency. At the same time, due to the unclear mechanism of interest distribution, there may be conflicts of interest among all parties in cooperation, which may affect the stability and sustainability of the cooperation.

#### **3.2. Poor talent mobility**

The poor flow of talent between universities and enterprises is also an important issue affecting industry-university research cooperation. On the one hand, researchers in universities often lack practical experience in enterprises, making it difficult to transform research results into actual productivity. On the other hand, it is also difficult for technical personnel of enterprises to enter universities for further studies and exchanges, which affects the technological innovation capability of enterprises. In addition, due to the lack of effective talent incentive mechanisms, the enthusiasm for talent mobility between universities and enterprises is not high.

#### **3.3. Insufficient capital investment**

The cooperation between industry, academia and research in universities requires a large amount of capital investment, including research funding, equipment procurement, talent cultivation, and other aspects. However, there is still a problem of insufficient funding for industry-university research cooperation at present. The proportion of funding between the government, enterprises, and universities is unreasonable, which affects the depth and breadth of cooperation. Meanwhile, due to the lack of effective fund management mechanisms, the efficiency of fund utilization is also low.

#### **3.4. Inadequate protection of intellectual property rights**

Intellectual property protection is an important issue in industry-university research cooperation. In the process of cooperation, universities and enterprises often produce some intellectual property achievements. If intellectual property protection is not effective, it may lead to intellectual property disputes and affect the smooth progress of cooperation. At present, China's intellectual property protection system is not yet perfect, and the awareness of intellectual property protection in universities and enterprises is not strong enough. It is necessary to further strengthen the work of intellectual property protection.

### **4. Suggestions on promoting high-quality development of enterprises in pilot free trade zones and free trade ports**

#### **4.1. Improve cooperation mechanism**

- (1) Establish an effective communication and coordination mechanism

The government should play a leading role, establish communication and coordination mechanisms between universities, research institutions, and enterprises, and regularly organize industry-university research cooperation symposiums, project docking meetings, and other activities to promote information

exchange and cooperation among all parties. At the same time, establish an information platform for industry-university research cooperation, timely release scientific research achievements of universities and technological needs of enterprises, and provide convenience for cooperation among all parties.

(2) Clarify the mechanism for distributing benefits

In industry-university research cooperation, it is necessary to clarify the mechanism for distributing interests among all parties and allocate cooperation results reasonably based on their contributions. It is possible to clarify the rights and obligations of all parties and avoid conflicts of interest by signing cooperation agreements, developing benefit distribution plans, and other means. At the same time, establish and improve the supervision mechanism to ensure the fairness, impartiality, and reasonableness of the benefit distribution mechanism.

## **4.2. Promote talent mobility**

(1) Strengthen talent cultivation

Universities should strengthen cooperation with enterprises, jointly develop talent training programs, offer relevant courses and practical activities, and cultivate high-quality talents with practical abilities and innovative spirit. Meanwhile, universities can invite technical personnel from enterprises to serve as part-time teachers, imparting practical experience and technical knowledge to students. Enterprises can also provide internship and employment opportunities for college students, allowing them to develop their abilities through practical experience.

(2) Establish a talent mobility mechanism

The government should introduce relevant policies to encourage university researchers to work in enterprises for training and part-time entrepreneurship, providing technical support and services for enterprises. At the same time, it also encourages technical personnel of enterprises to pursue further studies and exchanges in universities, in order to improve their own technical level and innovation ability. Establish a talent mobility service platform to provide convenience for talent mobility.

(3) Improve the talent incentive mechanism

Universities and enterprises should establish and improve talent incentive mechanisms, provide material and spiritual rewards to talents who have made outstanding contributions in industry-university research cooperation, and stimulate their innovative vitality and enthusiasm. At the same time, the government can also introduce relevant policies to provide tax incentives, housing subsidies, and other policy support for talents participating in industry-university research cooperation.

## **4.3. Increase capital investment**

(1) The government increases investment efforts

The government should increase funding for industry-university research cooperation, establish special funds for industry-university research cooperation, and support universities and enterprises to carry out key technology research, achievement transformation and other projects. At the same time, the government can encourage enterprises to increase their investment in industry-university research cooperation through tax incentives, financial subsidies, and other means.

(2) Guide social capital investment

The government should introduce relevant policies to guide social capital to invest in university-industry research cooperation projects. Financial support can be provided for industry-university research



cooperation projects through the establishment of industrial investment funds, venture capital funds, and other means. At the same time, encourages financial institutions to innovate financial products and services, and provide financing support for university industry-university research cooperation projects.

(3) Strengthen fund management

Establish a sound fund management mechanism, strengthen the supervision and audit of industry-university research cooperation funds, and ensure the safety and rational use of funds. At the same time, improves the efficiency of fund utilization, and avoids waste and idle funds.

#### **4.4. Strengthen intellectual property protection**

(1) Improve the intellectual property protection system

The government should strengthen the construction of an intellectual property protection system, improve intellectual property laws and regulations, and increase the crackdown on intellectual property infringement. At the same time, establish a sound intellectual property service system to provide intellectual property consulting, agency, evaluation, and other services for universities and enterprises.

(2) Enhance awareness of intellectual property protection

Universities and enterprises should strengthen their awareness of intellectual property protection, establish and improve intellectual property management systems, and enhance the management and protection of intellectual property achievements. At the same time, strengthen intellectual property training for employees and enhance their awareness of intellectual property protection.

(3) Strengthen intellectual property cooperation

Universities and enterprises should strengthen intellectual property cooperation and jointly carry out intellectual property protection work. We can strengthen the protection and application of intellectual property achievements by signing intellectual property cooperation agreements, establishing intellectual property alliances, and other means.

#### **4.5. Practical exploration of promoting high-quality development of enterprises**

(1) Establish a normalized communication mechanism

Universities should establish a regular communication mechanism with pilot free trade zones and free trade port enterprises. Regular industry-university research cooperation forums, seminars, and other activities can be held to provide a platform for communication and cooperation between both parties. In these activities, universities can showcase the latest scientific research achievements, while enterprises can propose practical technical needs and development challenges, and jointly explore solutions. At the same time, by establishing specialized communication channels such as online communication platforms and regular visits, we can timely understand the changing needs of both parties, ensuring the efficiency and pertinence of cooperation.

(2) Jointly carry out project research and development

Universities and enterprises can jointly carry out project research and development around the characteristic industries and key development areas of free trade zones and free trade ports. For example, in the field of cross-border e-commerce, majors such as information technology and logistics management in universities can collaborate with enterprises to jointly develop projects such as intelligent logistics distribution systems and cross-border e-commerce data analysis platforms, to improve the operational efficiency and market competitiveness of enterprises. In terms of financial innovation,

finance majors in universities can collaborate with financial institutions to carry out financial technology research and development, and promote financial service innovation in pilot free trade zones and free trade ports.

(3) Co-building a collaborative base for industry-university research cooperation

Universities and enterprises can jointly establish industry-university research cooperation bases, provide internship and practical opportunities for students, and cultivate high-quality professional talents for enterprises. The base can be established within the enterprise, allowing students to learn and practice in a real work environment, improving their professional skills and practical abilities. At the same time, university teachers can also carry out research projects in the base to provide technical support and solutions for enterprises. In addition, the base can also serve as a training center for enterprises, providing continuing education and vocational training for employees and enhancing the overall quality of the enterprise.

(4) Promote the transformation of scientific and technological achievements

Universities should actively promote the transformation and application of scientific and technological achievements in free trade zones and free trade port enterprises. A technology transfer service platform can be established to provide enterprises with services such as technology information, technology evaluation, and intellectual property protection. At the same time, universities can transform scientific research achievements into actual productivity through technology transfer, cooperative development, and other means, creating economic benefits for enterprises. In addition, the government should also introduce relevant policies to encourage cooperation between universities and enterprises in the transformation of scientific and technological achievements and provide financial support and policy guarantees for both parties.

(5) Strengthen talent cultivation and communication

Universities should adjust their talent training programs and strengthen the construction of related majors according to the needs of enterprises in free trade zones and free trade ports. Specialized courses such as cross-border e-commerce, international trade, and financial technology can be offered to cultivate high-quality talents with international perspectives and innovative abilities. At the same time, universities and enterprises can carry out talent exchange and cooperation, select outstanding teachers to intern in enterprises, invite enterprise experts to serve as part-time professors in universities, and promote talent interaction and knowledge sharing between both parties.

Through practical exploration, the cooperation between universities, industry, academia and research can provide strong support and guarantee for the high-quality development of enterprises in free trade zones and free trade ports, achieving mutual benefit and win-win results between universities and enterprises.

## 5. Conclusion and prospect

The cooperation between industry, academia and research in universities is of crucial importance for the high-quality development of enterprises in pilot free trade zones and free trade ports. Firstly, this collaborative model achieves the optimization and integration of resources. The combination of the scientific research strength and talent reserve of universities with the funding, market channels, and practical platforms of enterprises has injected a strong impetus into innovative development. Through industry-university research cooperation, the scientific research achievements of universities can be quickly transformed into actual productivity, providing strong

support for enterprises to solve technical problems and enhance product competitiveness. Secondly, industry-university research cooperation promotes talent cultivation. Tailored talent training programs for pilot free trade zones and free trade port enterprises enable students to gain rich practical experience while learning theoretical knowledge, and adapt to the needs of enterprises more quickly after graduation, providing a continuous supply of talent support for the sustainable development of enterprises. Furthermore, cooperation has promoted the development of the regional economy. The close cooperation between universities and enterprises helps to enhance the industrial innovation level of free trade zones and free trade ports, attract more investment and enterprises to settle in, form a good industrial ecology, and thus drive the high-quality development of the entire regional economy.

In the future, the development prospects of university industry-university research cooperation in free trade zones and free trade ports are broad. In terms of cooperation depth, universities and enterprises will further strengthen cooperation in key technology research and development, core product innovation, and other fields to jointly overcome bottlenecks in industrial development. Cooperation will not only be limited to the technical level but will also expand to multiple aspects such as management mode innovation and corporate culture construction. In terms of cooperation breadth, with the continuous development of pilot free trade zones and free trade ports, more universities and enterprises will participate in industry-university research cooperation. A more diversified cooperation network will be formed between universities and various enterprises in different disciplines and fields, promoting the integrated development of industries. In terms of policy support, the government will further increase its support for university industry-university research cooperation, introduce more preferential policies and incentive measures, and create a better policy environment for cooperation. Meanwhile, with the continuous advancement of technology, emerging technologies such as artificial intelligence, big data, and blockchain will bring new opportunities and challenges to university industry academia research cooperation. Universities and enterprises should actively embrace new technologies, continuously innovate cooperation models, and improve cooperation efficiency and quality.

In short, the development of industry university research cooperation in free trade zones and free trade ports is full of hope. Through the joint efforts of all parties, it will undoubtedly make greater contributions to China's opening up to the outside world and high-quality economic development.

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## **Disclosure statement**

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