

Current Situation and Countermeasures of Innovation and Entrepreneurship Environment for Science and Technology Talents in Guangdong Province

Jiahui Liang

School of Finance and Economics
Guangdong University of Science & Technology
Dongguan, 523083, China

Abstract—Guangdong province has fully implemented the strategy of "rejuvenating Guangdong by science and technology". The scientific and technological strategic achievements in the province are remarkable, and scientific and technological talents play a strategic and decisive role. Creating a good environment for innovation and entrepreneurship is the key to the growth and development of scientific and technological talents. Through consulting literature and investigation, it is found that the construction of science and education environment, economic environment and entrepreneurial environment in Guangdong province is in the forefront of all provinces, but there still exists some problems, such as insufficient financing for innovation and entrepreneurship, incomplete construction of innovation and entrepreneurship carrier and unsound social service system. By further improving the financing environment for innovation and entrepreneurship, accelerating the construction of innovation and entrepreneurship carriers, and strengthening the construction of socialized service system for innovation and entrepreneurship, the construction of the environment for innovation and entrepreneurship in Guangdong province can be accelerated, so as to realize the goal of "rejuvenating Guangdong by science and technology" at an early date.

Keywords—Guangdong province; science and technology talent; innovation and entrepreneurship environment

I. INTRODUCTION

Guangdong province is the largest province of economic development in China. The new economy, new business form and new business development mode in the province are booming, and scientific and technological talents are the key to the development of economic innovation. In the national medium and long-term scientific and technological talents development plan (2010-2020), the main goal of scientific and technological talents in China by 2020 is to build a team of innovative scientific and technological talents with large scale, excellent quality, reasonable structure and vitality. The cultivation of innovative talents depends on the construction of excellent innovative entrepreneurial environment, which is conducive to the cultivation and development of scientific and technological talents, and can also promote the development of scientific and technological undertakings. The environment of innovation and entrepreneurship refers to the sum of various

material and spiritual conditions closely related to the development of innovative entrepreneurial activities by scientific and technological talents [1], which mainly includes policy environment, economic environment, science and education environment, employment environment, financing environment, entrepreneurial environment, living environment, cultural environment and natural environment [2].

II. ANALYSIS ON THE CURRENT SITUATION OF INNOVATION AND ENTREPRENEURSHIP ENVIRONMENT FOR SCIENCE AND TECHNOLOGY TALENTS IN GUANGDONG PROVINCE

A. The support of government policy is increasing

In recent years, Guangdong provincial government has promulgated a number of new policies to increase the support for innovation and entrepreneurship according to the actual needs. Starting from the aspects of lowering the threshold and cost of entrepreneurship, encouraging college students, young people from Hong Kong and Macao to innovate and start businesses, providing protection for entrepreneurs and entrepreneurial enterprises, and strengthening the protection of patent intellectual property rights, the government issued *Opinions on Further Promoting Entrepreneurship and Promoting Employment* in February 2016. In August 2016, the government supported the annual scale of 20 million "climbing plan" (Guangdong university students' special fund for scientific and technological innovation cultivation). In November 2018, Guangdong issued "nine articles for promoting employment". In August 2019, the government issues the *Implementation Plan for Strengthening the Construction of Innovation and Entrepreneurship Bases for Young people in Hong Kong and Macao*. In August 2019, the government issued the *Implementation Rules of the Special Fund for Supporting the Development of Innovation and Entrepreneurship Carriers in the Qianhai Shengang Modern Service Industry Cooperation Zone (Trial)*. In addition, the amount of additional deductions for research and development has been increased, and the implementation of these policies plays an important role in promoting a favorable environment for innovation and entrepreneurship.

B. Continuous optimization of the resource environment for innovation and entrepreneurship

Investment in scientific research is increasing [3]. By the end of 2017, the number of research and experimental development (R&D) activists in Guangdong province was 879900, increasing 19.68% over the same period last year. Internal expenditure on research and experimental development (R&D) funds was 234.363 billion yuan, increasing 15.16% over the same period last year. The internal expenditure of research and experimental development funds was equivalent to 2.61% of the regional GDP. The number of research and experimental development (R&D) projects was 170214, increasing 25.48% over the same period last year.

The level of technology is constantly improving. In 2018, the number of scientific and technological awards received at the national level was 45, increasing 18.42% over the same period last year; the number of basic theoretical achievements obtained was 382, increasing 87.25% over the same period last year; and the number of soft science achievements obtained was 107, increasing 118.37% over the same period last year. Although the number of provincial-level major scientific and technological achievements and the applied technological achievements has declined, the overall trend in the number of acquisitions in the last five years has increased. The total number of patent authorizations for invention was 464282, increasing 39.57% over the same period last year. In the past five years, the number of patent authorizations has increased year by year. The science and technology of Guangdong province is mainly concentrated in Shenzhen, Guangzhou, Foshan and Dongguan, mainly in the manufacturing industry, and the research technology in physics, transportation and electricity is very strong.

Efforts to build platforms for innovation and entrepreneurship have been intensified. By 2018, there were more than 40,000 high-tech enterprises in the province, increasing 21.21% over the same period last year. The output value of high-tech products was 7.4 trillion yuan, increasing 10.44% over the same period last year. There were 15 national engineering laboratories in the whole province, increasing 15.38% over the same period last year. There were 71 national local joint innovation platforms, increasing 7.6% year on year. 4215 provincial engineering research centers have been established and continue to develop on the basis of the previous year. 94 enterprise technology centers have been identified, increasing 13.83% over the same period last year. There were 265 provincial enterprise technology centers, increasing 369.81% over the same period last year, and 434 technological innovation professional towns have been identified, increasing 0.69% over the same period last year [4].

C. Increasing the channels for innovation and entrepreneurship financing

One of the new widening channels of innovation and entrepreneurship financing is Internet finance. From the perspective of innovation and entrepreneurship financing, it mainly includes P2P net loan, network small loan and crowdfunding. P2P lending is when individuals borrow money, or borrow money, and pay interest through online platforms. At the end of May 2019, there were 379 P2P network loan

platforms in Guangdong province, ranking first in China, and the total amount of loans borrowed was also in the forefront of China. Network small loans can break the geographical restrictions of traditional small loans because of their Internet attributes, and can lend nationwide. Online small loan refers to the online lending of small companies to provide loans to small businesses. As of December 2018, Guangdong province approved 60 companies, accounting for 23% of China. The network small loan mainly solves the "short, small, frequency, urgent" capital demand of small and micro enterprises, mainly distributing in the real estate, automobile, construction, and trade logistics. Crowdfunding raises money from the public for an individual or organization. As of May 2019, Guangdong province has 13 crowdfunding platforms, accounting for 40% of China. Guangdong province is one of the leading industries in the development of the crowdfunding industry, which has an obvious function of the agglomeration industry.

III. ANALYSIS ON THE PROBLEMS OF INNOVATION AND ENTREPRENEURSHIP ENVIRONMENT IN GUANGDONG PROVINCE

In recent years, the Guangdong provincial government has strengthened its support for innovation and entrepreneurship, and the infrastructure construction of innovation and entrepreneurship environment has greatly improved compared with the past, but there are still some problems below.

A. Inadequate financing for innovation and entrepreneurship

In the process of innovation and entrepreneurship, scientific and technological talents are often short of funds. The annual application research and development funds are insufficient, so that the research and development projects can not carry out according to the expectation, especially in colleges and universities. If teachers want to have the funds of applied research and development, they must go through the project approval, but not all the projects are funded, and many projects are self-funded, so it is not conducive to the scientific research enthusiasm of university teachers. There will be financial conflicts from technology entrepreneurship to enterprise growth, although, in recent years, the provincial government has issued a lot of policies to solve the problem of financing difficulties of start-up enterprises, financing difficulties are still the problems faced by start-up enterprises. There are not many channels for financing entrepreneurial innovation funds, which are restricted by the application terms, resulting in many projects being blocked or staying in the preparatory stage.

B. Incomplete construction of innovation and entrepreneurship carriers

Innovation and entrepreneurship carriers mainly include the innovation and entrepreneurship platform and the innovation and entrepreneurship base. On the platform of innovation and entrepreneurship, Shenzhen is the benchmark city of innovation and entrepreneurship in Guangdong province, but its experience of innovation and entrepreneurship has not been extended to the whole province for reference. Taking Dongguan city, Guangdong province as an example, the distribution of innovation and entrepreneurship platforms in Dongguan City is not balanced, and Songshan lake district has the most innovation and entrepreneurship platforms, followed

by Nancheng and Guancheng streets, while the towns are relatively few, and some townships have none. Scientific and technological research and development areas, entrepreneurial parks, public space also have the problem of uneven distribution. At the same time, the innovation and entrepreneurship incubation platform is single, and many entrepreneurial park resources integration is not in place, so it is difficult for many creative space to generate income. In colleges and universities, relying on self-built laboratories, or cooperative construction of off-campus practice base, student innovation and entrepreneurship practice platforms are built. Among these platforms, most of the practice bases jointly built with off-campus enterprises are at the shallow level of cooperation, but deep cooperation is still rare.

C. The social service system for innovation and entrepreneurship is not perfect

The socialized service system of enterprises based on innovation and entrepreneurship in Guangdong province is not perfect, especially small and medium-sized enterprises, so it is difficult to get accurate grasp of the difficult points of innovation and entrepreneurship services. The achievements of innovation and entrepreneurship of scientific and technological talents are not run by a single organization, but by a series of socialized services. The socialized service system of innovation and entrepreneurship includes policy support, information support, creative training, talent cultivation and so on, which provides professional operation management, professional guidance and professional service for scientific and technological talents, projects or enterprises. In the social service system of entrepreneurship and innovation in Guangdong, there exists problems such as insufficient government attention, insufficient capital investment, small scale of service enterprises and insufficient understanding of social service institutions. As a result, in the process of innovation and entrepreneurship, enterprises cannot find projects or implement projects properly, and the conversion rate of scientific and technological achievements in Guangdong is very low.

IV. COUNTERMEASURES FOR THE CONSTRUCTION OF INNOVATION AND ENTREPRENEURSHIP ENVIRONMENT FOR SCIENTIFIC AND TECHNOLOGICAL TALENTS IN GUANGDONG PROVINCE

A. Further improving the environment for innovation and entrepreneurship financing

Through increasing financial support and guidance, the problem of shortage of R&D funds for the application of scientific and technological talents can be effectively solved. The expenditure on scientific research funds is increased every year, special funds such as venture employment funds are built, scientific and technological innovation strategies are initiated, and banks, enterprises, scientific and technological personnel are united to carry out investment and financing docking. Multi-channel financing channels are opened up, different means of direct or indirect financing are implemented, different forces of society are integrated, and all are comprehensively coordinated by the government, so as to improve support policies for innovation and entrepreneurship. In addition, Guangdong province has actively promoted the combination of

science and technology and finance to solve the problem of enterprise financing difficulties. Colleges and universities also improve the reward standard of scientific research funds for projects at different levels, such as national level and provincial level, adjust the subsidy of funds published in core journals, and greatly improve the enthusiasm of teachers in scientific research. In addition, the school also implements the method of changing the workload of teaching and scientific research, creating conditions to improve the scientific research environment of teachers and increasing the time of scientific research.

B. Speeding up the construction of innovation and entrepreneurship carriers

Led by Guangdong-Hong Kong-Macau Greater Bay Area (Guangdong) innovation and entrepreneurship incubator base, innovation and entrepreneurship bases are constructed in Nansha, Jiangmen, Zengcheng, Guangzhou, Shenzhen-Hong Kong, Hengqin, Foshan, Huizhou, Dongguan, Zhongshan, Zhaoqing and other places, driving the establishment of a batch of innovation and entrepreneurship platform carriers. Scientific design, perfect supporting facilities, and integration of resources in Guangdong province are used to create a model carrier for cultivation, exchange, incubation, display and docking. The provincial government has promulgated policies to support the development of innovation and entrepreneurship carriers by reducing construction costs and setting up special funds for construction [5]. In 2019, Guangdong province promulgated the *Guidelines on Deepening Reform and Accelerating the Transformation of the "Three Old" Areas to Promote High-quality Development*, so as to lighten the tax burden of the "three old" transformation projects, reduce the cost of the construction of innovation and entrepreneurship carriers, and increase the support for the transformation projects. Shenzhen set up Qianhai Shengang modern service cooperation Zone to support the development of innovation and entrepreneurship carrier special fund implementation rules (trial), support the development of local innovation and entrepreneurship carrier, clear the scope of innovation and entrepreneurship carrier, set support methods and standards, application and supervision procedures. In colleges and universities, the construction of laboratory should be strengthened. For professional compulsory courses, a complete set of experimental courses throughout the week should be set up, laboratories should be built, experimental software should be purchased, and practical platform should be constructed, so as to cultivate students' hands-on ability. Off-campus practice bases should be established with government departments, associations and enterprises to set up innovation classes, give lectures to enterprise executives, and meet the talent needs of enterprises.

C. Strengthening the construction of the social service system for innovation and entrepreneurship

In the construction of socialized service system of innovation and entrepreneurship, first, the government should increase the support and provide services such as policy, management, guidance, coordination, docking and supervision. Policy support chain should be implemented to provide one-stop service to science and technology enterprises, and guide innovation and entrepreneurship carriers to develop in

the direction of specialization, branding and internationalization [6]. Second, joint offices of government functional departments should be established to coordinate and solve problems encountered in the development of science and technology enterprises, increase financial and tax support for science and technology enterprises, increase the amount of research and development expenses, and clarify the identification procedures for science and technology enterprises, especially high-tech enterprises and advanced technology enterprises. Third, the development of science and technology finance should be promoted, so as to seize the development opportunities presented by the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, realize the application of blockchain and big data technology in science and technology enterprises, strengthen the supervision of science and technology finance, and improve the service level of science and technology enterprises. Fourth, a full chain service of innovation and entrepreneurship carrier should be built. Incubated projects should be provided with low-cost and convenient sharing facilities, and be equipped with professional team services. A school-enterprise alliance should be established for science and technology enterprises, so as to provide a one-stop service throughout the process. Especially, the backbone science and technology enterprises should be supported to promote the incubation mode of "incubating + venture capital", and "entrepreneurial nursery" should be built to promote the internationalization of science and technology incubation, build an international platform, and carry out international exchanges.

V. SUMMARY

The construction of innovation and entrepreneurship environment for scientific and technological talents in Guangdong province mainly focuses on the policy environment, economic environment, financing environment and entrepreneurial environment. In view of the problems existing in the implementation of the current financing environment and entrepreneurial environment, this work first analyzed further improved solutions, so as to create an open, harmonious and dynamic environment for innovation and entrepreneurship, and stimulate the vitality of scientific and technological talents to innovate and start their businesses. For the past few years, Guangdong province has promulgated a series of policies to support the development of innovation and entrepreneurship and attract scientific and technological

talents to start employment. Although at this stage financing entrepreneurial environment still have room for improvement and innovation, in the near future, the government will take into full consideration the needs of all kinds of scientific and technological personnel, and give support from the policy, economy, finance, entrepreneurship and aspects, so as to strengthen institutional support, gradually improve the public research and development platform and social service system, and create a good environment for innovation and entrepreneurship in Guangdong province.

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- 2) Key Research Project of Guangdong University of Science and Technology 2017: *Evaluation and Countermeasures of Innovation and Entrepreneurship Environment for Science and Technology Talents in Guangdong Province* (No. GKY-2017KYZD-5).

REFERENCES

- [1] Xiong Limin, Zhang Kangguang. Science and Technology Talent Innovation and Entrepreneurship Environment Construction Research in Guangdong Province[J]. China Securities Futures, 2011(7):75-76.
- [2] Jin Xinxin. Study on the Present Situation and Countermeasures of the Development Environment of the Scientific and Technological Returnees in Hainan Province[J]. Journal of Anyang Institute of Technology, 2017(16): 75-78, 91.
- [3] Economic Performance of Guangdong Province in 2018: <http://www.cnstats.org/jjpc/201902/gdsgds-2018-ferfx.html>, Guangdong Provincial Bureau of Statistics, 2019-02-16.
- [4] Guangdong Provincial Statistical Bulletin on National Economic and Social Development 2018: http://www.cnstats.org/tjgb/201903/gdsgds-2018-jqd_2.htm 1, Guangdong Provincial Bureau of Statistics, 2019-03-26;
- [5] Chen Xiqiang. Present Situation and Countermeasure Analysis of Guangdong Innovation Environment Construction[J]. Guangdong Science and Technology, 2018(15): 5-6;
- [6] Gao Ranhui, Zhang Yufu. Jiangsu Science and Technology Talent Innovation and Entrepreneurship Ecological Environment Research - Analysis Based on Questionnaire[J]. Special Economic Zone, 2015(5): 42-44.