Causes and Countermeasures of the Loss of Sci-tech Talents in Jiangsu of China

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Abstract

Talents are the fundamental driving force for economic and enterprise development. Attracting, introducing, retaining and cultivating talents are the goals of the strategy of "Strengthening the Province by Talents" in Jiangsu Province. Based on the current situation of the loss of sci-tech talents in Jiangsu Province, this paper finds out the problems of the structural imbalance of sci-tech talents, the uneven distribution of sci-tech talents in various regions, and the serious brain drain in some cities. Based on the above problems, In view of the above problems, this paper explores the causes of talent mobility from the perspectives of population, government, enterprises and living environment, mainly including the aging of the population leading to the decline of the demographic dividend, government policies affecting the flow of sci-tech talents, the strength of enterprises determines the retention of sci-tech talents, and living environment restricts technology Talent selection, etc.; and on this basis, proposed countermeasures and suggestions to improve the attractiveness of sci-tech talents in Jiangsu Province and promote the rational flow of talents, including improving the population development strategy, optimizing the population quality structure; giving full play to the guiding role of the government to create a good atmosphere for talent introduction; perfect corporate incentive mechanism to form a virtuous competition and cooperation atmosphere; provide precise services for talents and optimize the development environment for sci-tech talents.

Keywords

Jiangsu Province; Sci-tech talents; Loss.

1. Introduction

Practice shows that the most important resource for a region to develop rapidly and sustainably is talents, and the competition for talents has become a vital part of regional competition. As a kind of scarce strategic resources and scarce elements in the talent team, the inflow or outflow of sci-tech talents can improve or reduce the productivity of other input factors by their special knowledge and skills, thus producing multiple impacts that are beneficial or unfavorable to regional economic and technological development. Since 2017, China's second and third-tier cities have successively launched a magnificent "talent war". All parts of China have issued a series of sincere new policies for talents, covering easy settlement, employment and entrepreneurship incentives, rental housing discounts, cash subsidies, etc. Under a series of new policies on talents, the number of talents settled in major cities has soared rapidly, which also leads to the loss of sci-tech talents in many regions. At present, Jiangsu Province is in the key stage of economic transformation and upgrading. Speeding up the construction of a strong province with talents and focusing on cultivating a high-quality talent team are important choices for promoting scientific development and building a beautiful Jiangsu Province and providing talent support and intellectual support. Therefore, how to break the shackles of traditional talent management, improve the flow mechanism of sci-technological talents,
optimize the allocation of innovative resources, and promote the internationalization of talents have become a new proposition faced by talents and innovation management departments at all levels in Jiangsu Province under the new situation.

2. The current situation and problems of the loss of sci-tech talents in Jiangsu

Jiangsu has been a place where humanities gather since ancient times, and the saying of "talents in the south of the Yangtze River" also proves that people have been accustomed to connecting talents with Jiangsu in their thoughts. In addition to a group of historical figures such as Zhou Enlai, Xu Guangqi, Fei Xiaotong, Hua Luogeng and Zhou Peiyuan, the contemporary talent pool of Jiangsu Province is also quite abundant. The modern economic and social environment shows great uncertainty and turbulence. Therefore, technological innovation has become a basic skill for survival and development. Jiangsu Province has a good performance in innovation, which is due to the efforts of sci-tech talents. Statistics on the hometowns of the academicians of the two academies from 1955 to 2015 are divided into groups and counted by region. The top three provinces are 450 in Jiangsu, 375 in Zhejiang, and 145 in Guangdong. Qian Weichang, a famous scientist, is a native of Jiangsu, which shows that Jiangsu ranks first in the total number of sci-tech talents. According to statistics of the number of high-level talents from 2013 to 2017, the total number of Jiangsu is 582, ranking the third in China, only after Beijing and Shanghai. These data all show the huge talent pool in Jiangsu. Looking at the development of Jiangsu in recent years, there is no negative growth in the total number of sci-tech talents in Jiangsu, but the talent structure and the number of talents among different cities are not balanced. The main problems are as follows:

2.1. The unbalanced structure of sci-tech talents in Jiangsu

The total scale of sci-tech talents in Jiangsu has certain advantages, but there are few high-level innovative talents, and the structural imbalance of sci-tech talents is obvious. There is a lack of leaders with global competitiveness, the overall strength and overall level are not enough, the talent team is "big but not strong", and there is a lack of high-end scientific research talents, especially the "high-tech and top-notch" talents who stand at the forefront of industry technology development and can participate in international competition. Insufficient talents and their international influence is weak. In the 2017 "Highly Cited Scientists" list released by Clarivate Analytics, China (including Hong Kong, Macao and Taiwan) was selected 265 people, of which 215 were from the mainland and only 15 were from Jiangsu. It can be seen that there are many general innovative and entrepreneurial talents in Jiangsu, but there are a shortage of compound innovative and entrepreneurial talents, high-tech leading talents and high-end talents in strategic emerging industries who can break through major key technologies, overcome major technical problems, and lead industrial innovation and development. There is a lack of innovative and entrepreneurial leading talents like Jack Ma and Ren Zhengfei, and the reserve of "high-tech and cutting-edge" professional sci-tech talents cannot keep up with the requirements of industrial innovation and development; advanced manufacturing and other leading industries have insufficient sci-tech human capital, and core sci-tech talents are drained serious. The existing high-level sci-tech talents are unevenly distributed in universities, scientific research institutes and enterprises. More than 60% of high-level sci-tech human capital is concentrated in universities and scientific research institutes, and the trend of this part to the front line of enterprises is not obvious.

2.2. Uneven distribution of sci-tech talents in various regions of Jiangsu

Extremely uneven economic development in Jiangsu has led to regional differences in the distribution of sci-tech talents. Data from the "Jiangsu Statistical Yearbook 2018" shows that
the number of graduate students in Jiangsu in 2017 was 45,802, while Nanjing accounted for 30,733, and the number of graduate students in Yancheng, Taizhou and Suqian was 0. According to the talent Competitiveness Report of Jiangsu Province in 2016, Suzhou, Nanjing and Wuxi are in the first echelon of talent competitiveness, and their overall score is higher than 0.7. However, the talent competitiveness of the three cities of Huai’nan, Lianyungang and Suqian in the third echelon is relatively low, with scores below 0.3. Also, the "Statistical Data Table of Talent Development in Each County (City) of Jiangsu Province in 2016" shows that only Nanjing, Suzhou, Wuxi, Changzhou, and Xuzhou have an increase in the number of experts in the "Thousand Talents Program" in Jiangsu Province, while the data of other cities are 0. Therefore, it can be seen that the distribution of sci-tech talents in Jiangsu Province is very uneven, and its distribution law has a coupling effect with the level of economic development. Therefore, the brain drain situation in different regions of Jiangsu Province is not the same. It is difficult to generalize and needs to be looked at separately.

2.3. Some cities in Jiangsu have serious brain drain

As the second strongest province in my country’s economy after Guangdong, Jiangsu is a place where many talents and fresh graduates aspire, especially cities such as Suzhou and Nanjing, which are not only relatively developed now, but also have great development potential in the future. However, the development of talents in Jiangsu has experienced regional imbalances, presenting a diametrically opposite situation in southern Jiangsu and northern Jiangsu. The influx of talents in southern Jiangsu has been steadily influx, while there has been a brain drain in northern Jiangsu. Among them, Xuzhou and Nantong are the most obvious. Xuzhou, as the northernmost city in Jiangsu Province, had a population growth of only 20,000 during the ten years from 2007 to 2017. In 2016, Xuzhou had a registered population of 10.413 million, a permanent resident population of 8.71 million, and a net outflow of 1,703,900. By 2017, the permanent population of Xuzhou is 8,763,500, which is a slight increase. From the data of sci-tech talents, the "Report on the Competitiveness of Entrepreneurial Talents in Jiangsu Province" showed that the number of high-level overseas returned entrepreneurs in Xuzhou did not increase in 2016, but only one person was added in 2017. There is a serious loss of talent in Xuzhou. In addition, Nantong is also facing the problem of brain drain. The "Report on the Competitiveness of Entrepreneurial Talents in Jiangsu Province" shows that the number of high-level overseas returning entrepreneurs in Nantong has not increased for two consecutive years from 2016 to 2017. The number of permanent residents in Nantong in 2016 was 7.302 million. The permanent population in 2017 was 7.305 million, while the number of employed people in Nantong dropped from 4.58 million in 2016 to 4.56 million in 2017. This is enough to show that Nantong has a serious brain drain.

3. Reasons for the loss of sci-tech talents in Jiangsu

3.1. The aging population leads to the decline of demographic dividend

With the arrival of the new normal of an aging society and economic development, the demographic dividend is declining, and the population structure advantage of Jiangsu is gradually weakening. According to the Statistical Bulletin of National Economic and Social Development of Jiangsu in 2017, there are 80.293 million permanent residents in Jiangsu, and 16.2302 million people aged 60 and above, accounting for 20.21%. There were 10.732 million people aged 65 and above, accounting for 13.37%. Internationally, when the population aged over 60 accounts for 10% of the total population in a country or region, or 7% of the total population aged over 65, it means that the population of the country or region is in an aging society. Jiangsu is far beyond the standard. The birth rate of Jiangsu in 2017 was 9.71 ‰, 0.05 thousandth point lower than that of the previous year. After the implementation of the "two-child policy", the fertility level of Jiangsu has not been greatly improved. Under the condition of
long-term low fertility level, the advantage of population structure supporting the rapid economic growth of Jiangsu has gradually weakened. "Thirteenth Five-Year Plan for Population Development in Jiangsu Province" points out that in the next 5-10 years, the natural growth of the population in Jiangsu will show negative growth. At the same time, with the slowdown of economic growth, structural adjustment and transformation and upgrading, the provincial net migration inflow population will gradually stop growth or negative growth. With the shortage of human capital, Jiangsu's economic and social development is increasingly dependent on foreign labor, labor supply capacity continues to decline, the absolute number of the working-age population is decreasing, the age structure is aging, the labor participation rate is decreasing, and labor cost is rising. The total amount of human resources needed for industrial transformation and upgrading and innovation and development is insufficient, the growth rate is slowing down, and the structure of supply and demand is unbalanced.

3.2. **Government policies affect the flow of sci-tech talents**

The flow of sci-tech talents is inevitable in the social, political and economic environment. The attitude of the government will affect the talent strategy of enterprises and the flow decision of talents. Corresponding to China's "Strengthening the Country by Talents" strategy, all provinces put talent work on the government's agenda. In order to promote the introduction and cultivation of sci-tech talents and promote the development of high-tech industries, all provinces have formulated many preferential policies on the issue of sci-tech talents, involving household registration, house purchase, medical insurance, financing, family employment, children's enrollment, etc., and strive to provide good policy support and life welfare guarantee for talents to enter the region to carry out innovation and entrepreneurship activities. The policies and treatments for talents at home and abroad are different, and the emphasis on talent work and the implementation of policies vary in different provinces and cities. The comparison and selection of these factors will cause the flow of sci-tech talents. Even in Jiangsu, combined with the characteristics of local high-tech industry development and the demand for sci-tech talents, talent policies of each city also have differences. For example, Beijing's "Overseas Talents Gathering Project", Shanghai's "Eagle Homing Program", Hangzhou's "Global Talents Gathering and Opening-up Cultivation Policy", Shenzhen's "Peacock Project", Chengdu's "Rongpiao Project" and Jiangsu's introduction of sci-tech talents policy. When thinking about where to go, high-end sci-tech talents will inevitably compare and think about the talent policies of various provinces, cities, and regions according to their actual conditions, weigh the pros and cons, and choose the policy location that is most beneficial to themselves. In addition to the specific content of the policy, there are also differences in the implementation of the policy in various provinces and cities. Matthew effect of government resources will also affect the flow of talents. After the formulation of policies, financial support, financing concessions, patent rewards, etc., in cities with more developed economies and better development of high-tech industries tend to have higher support quotas and stronger policies, which makes it easier to attract sci-tech talents and promote the further development of high-tech industries. Such a cycle will form a closed "Matthew effect chain" of causal interaction, resulting in a situation in which cities are "the strong are stronger, the strong are always strong". The existence of the Matthew effect will also affect the flow of sci-tech talents.

3.3. **The strength of the enterprise determines the inflow or outflow of sci-tech talents**

Enterprises engaged in the business operation of high-tech industries provide a choice for the flow of sci-tech talents in most industries. The comprehensive strength and system of enterprises are important reasons for the inflow or outflow of talents. First of all, the system of the enterprise is related to the vital interests of talents. Whether the human resource management system is reasonable, flexible and humanized, whether the salary system is fair,
whether the incentive system is effective, and whether the employee welfare is sufficient will have a direct impact on the economic interests and quality of life of talents. Good management system and sufficient economic benefits are the most direct attraction for sci-tech talents, and also the most direct reason for the internal loss of sci-tech talents. Secondly, the internal culture construction of enterprises is also a factor that causes the flow of sci-tech talents. The concept of respecting talents, the atmosphere of cooperation and competition, and the appointment of making the best of their talents will make the talents feel the importance attached to them by the enterprises, attract foreign sci-tech talents, and also make the internal excellent talents have a sense of belonging and achievement and are willing to stay. Thirdly, as mentioned above, the most important thing in the high-tech industry is R&D and innovation. Therefore, whether the investment in scientific research, the emphasis on the professional development of talents, the organization and development of in-depth training of talents, and the development space provided for talents can meet the pursuit of self-realization of sci-tech talents, which may also cause the flow of sci-tech talents. In addition, the hardware facilities, working environment and development potential of enterprises will also affect the job satisfaction and loyalty of sci-tech talents. The activities of an internal job transfer, overseas assignment, talent exchange and cooperation are also one of the reasons for talent flow.

3.4. Living environment limits the choice of sci-tech talents

The flow of sci-tech talents in Jiangsu is not only affected by partial human factors related to the government and enterprises, but also related to some objective environmental factors formed for a long time and can be changed in a short time. Sci-tech talents pursue the realization of self-worth, so they will attach great importance to the future development trend of their industries and enterprises. To some extent, the overall economic development level of a region also indicates the development potential and space of the high-tech industry. All along, many sci-tech talents have chosen to flow to these provinces to pursue their development and success in a better macro environment. However, in recent years, the soaring price level, especially the rising house price, has posed a certain challenge to the resettlement of foreign talents. With the pressure of food, clothing, housing and transportation, coupled with good policy support, many sci-tech talents choose to withdraw from the first-tier cities and move to areas with lower prices and less pressure on life. As far as Jiangsu Province is concerned, housing prices in Nanjing and Suzhou have soared in recent years, and the population has also become saturated, with high competition and high consumption. However, cities such as Yangzhou and Taizhou have relatively little pressure on life, and they are less demanding for sci-tech talents. There are various policy preferences and subsidies for the inflow, which has attracted many talents to return.

4. Countermeasures and Suggestions on the loss of sci-tech talents in Jiangsu

4.1. Improving the strategy of population development and optimize the structure of population quality

Facing the social background of serious aging and declining demographic dividend, Jiangsu should strive to improve the population development strategy and optimize the population quality structure. First of all, we should improve the population development strategy and establish a balanced population development strategy system. We should scientifically study and judge the population situation, make advanced planning and policy reserves because of the population change trend, improve the support system of fertility services and family development, promote the realization of an appropriate fertility level, maintain a reasonable number and structure of labor force, delay the aging of the population, and provide more
favorable demographic conditions for economic and social development. Secondly, Jiangsu should optimize the structure of population quality. We should encourage scientific understanding of the interaction between population and economy, society, resources and environment, and the changing trend of population quantity, quality, structure and distribution, and strengthen the overall planning of population and economic and social development strategy. We should implement the strategy of strengthening the province with human capital, give priority to investment in the overall development of people, increase the introduction and cultivation of talents, attract and gather high-quality young labor force, develop and utilize the human resources of the elderly, fully tap the demographic dividend, and promote the benign interaction between population and economy. So that the population can meet the needs of environmental carrying capacity and economic development in terms of quantity, quality, structure and distribution, and realize long-term balanced development. We should promote the coordination and progress of population development, economic development. At the same time, we should innovate and improve population development policies. Focusing on serving people's needs, protecting people's rights, and promoting human development, we will strive to build a population development policy system such as population migration, childbirth, elderly care, human resource development, and family welfare, and strengthen policy support for balanced population development.

4.2. Giving full play to the guiding role of the government to attract and retain all kinds of sci-tech talents

The government should give full play to its guiding role, take policies as the main means, increase the strength of talent work in the whole province, create a good atmosphere for the introduction of sci-tech talents, improve the attraction of sci-tech talents, promote the transformation of their intellectual elements into actual productivity, and give them the sense of achievement and development space needed by sci-tech talents, so as to attract, retain and promote the reasonable flow of talents. First, in terms of talent work, the government should clarify the overall direction, continue to implement the strategy of "Strengthening the Province by Talents", constantly improve various policy systems, and create a good atmosphere for attracting talents. The government should actively implement the policy of funding training subsidies, encourage enterprises and talents to organize and participate in higher-level education and training in various forms, so as to provide conditions and support for the development of sci-tech talents, so as to improve the job satisfaction and loyalty of talents, retain talents and maintain their competitiveness. Secondly, we should accelerate the cultivation and expansion of various forms of innovation and entrepreneurship carriers. We will continue to attach importance to and adhere to the construction and cultivation of various kinds of sci-tech incubators including talent innovation and entrepreneurship base, sci-tech entrepreneurship park, university sci-tech park, and entrepreneurship service center, as well as much good innovation and entrepreneurship carriers such as enterprise academician workstation and engineering technology research center, so as to improve the construction level of hardware facilities, increase capital investment and support, encourage innovation, and form good scientific research innovation and entrepreneurship atmosphere, so as to attract the return of sci-tech talents. Thirdly, governments at all levels should strengthen cooperation and exchange and resource sharing to promote the rational distribution of resources among different regions in Jiangsu. On the one hand, the government should actively take the lead, with the help of various platforms and carriers, to promote the exchange and cooperation among sci-tech talents in academic, scientific research and innovation fields, so as to accelerate the overall upgrading of the industrial chain and the improvement of scientific research ability, and promote the further implementation of the strategy of "Strengthening the Province by Sci-tech". On the other hand, when formulating policies, governments at all levels should take into
account the historical development differences of different regions, and reasonably and fairly allocate funds, talents and various quotas. We should break the closed "Matthew effect chain" so that sci-tech talents are willing to gradually return to the north of Jiangsu, which is in urgent need of talents. Also, we should establish and improve the information statistics system and speed up the construction of talent information sharing platform. It is necessary to pay attention to the statistical work of sci-tech talents in high-tech industries and to sort out and analyze them, so as to make clear the overall situation of Jiangsu and various regions’ sci-tech talents reserve, age, industry, region, education background, skill structure distribution, flow, market supply and demand, etc. We should make the best use of talents, realize the reasonable flow of talents so that people can quickly put into satisfactory positions for innovation and entrepreneurship activities, and bring development impetus for high-tech industries in various regions.

4.3. Improving the incentive mechanism of enterprises to form a benign atmosphere of competition and cooperation

In formulating policies, the government can only give guidance from the overall policy, and give promises and support in policies and regulations. It is enterprises engaged in all kinds of business in the high-tech industries that directly deal with talents and determine the effectiveness of the introduction and cultivation of sci-tech talents. Therefore, enterprises should pay attention to the construction of the system and culture. Enterprises should establish and improve the salary management, daily management, employee welfare system, pay attention to the internal culture construction, create the internal culture of respecting talents and scientific research and innovation achievements, improve the incentive mechanism, guide the formation of a benign competition and cooperative atmosphere between sci-tech talents, and attach importance to the career planning of talents to convey the importance of the long-term development of talents, integrate the development space and success opportunities of talents with the goal of enterprise development. Enterprises should make full use of the government's policies such as training subsidies for sci-tech talents to provide training opportunities and conditions for talents, further improve the professional quality and innovation ability of talents, and finally transform them into the productivity of enterprises. Besides, enterprises should also increase R&D investment and encourage talents to make full use of R&D resources for innovation using a cash reward, shareholding award and income sharing. Only by improving the talent work from all aspects of system and management, can we establish a good employer brand, enhance the attraction of enterprises for sci-tech talents, and drive the inflow of talents.

4.4. Provide precise services for talents and optimize the development environment for sci-tech talents

Without talents, it is impossible to have the advantages of innovation, technology and industry. Talent introduction is only the first step of sci-tech talent strategy, how to retain talent and give full play to its innovation value is very important. Retaining talents is the driving force to achieve high-quality development of the regional economy. All regions should provide accurate services and constantly optimize the environment for the development of sci-tech talents. It includes not only regional hardware and software facilities, but also public services and business environment. We should rely on the ecological environment of human capital to attract and retain talents and realize the sustainable development of human capital. First, the service must be "precise". The ability of a region to absorb various kinds of sci-tech talents lies in its hardware and software environment. To do a good job in precision service, we should not only let all kinds of sci-tech talents have a sense of belonging at home, but also solve their actual needs, and provide them with logistics services such as housing, medical security and children’s education. Solve their life problems, so that they can take root in employment and
entrepreneurship. Second, the policy must be "precise". The formulation and implementation of the strategy of sci-tech talents should be connected with various kinds of sci-tech talents to understand their demands. Based on implementing preferential policies for talents, we should integrate limited resources and vigorously to develop promising and attractive industries. At the same time, it will provide a development platform matching their knowledge and ability for all kinds of sci-tech talents, create an atmosphere of tolerance for failure, and encourage them to open their hands, boldly innovate and realize their value.

References


