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Analysis of Influencing Factors of Electronic and Communication Equipment Manufacturing Industry from the Perspective of Innovation

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***Abstract*—From the perspective of innovation ecosystem, this paper selects the development indicators that influence the high-tech industries. Using the method of factor analysis, this paper structures a new state of three factors of high-tech industry innovation system including the high-tech industry innovation potential, high-tech industry flow and high-tech industry state. The study found that compared to other high-tech industries, the key to the development of electronic and communication equipment manufacturing industry is to realize efficient conversion of high-tech industry innovation, including effective output of innovative products and the investment of the innovation capital. This paper summarizes three factors affecting electronic and telecommunication equipment manufacturing industry's development. The factor lies in the way the better external support, more attention to the efficiency, the validity of innovation and transformation and market oriented production. The innovation lies in summarizing the development of the electronic and communication equipment manufacturing industry from the three dimensions of the innovation ecosystem.**

***Keywords*—electronic *and* communication equipment manufacturing industry; high-tech industry; innovation factors; factor analysis**

I. INTRODUCTION

The development of high and new technology industry not only plays an important role in stimulating the growth of national economic to a great extent but has received extensive attention from various industries. As a member of the high and new technology industry, the electronic and communication equipment manufacturing industry has been supported by the Chinese government for a long time, which is better than other high-tech industries. As of 2015, the total profit generated by the electronic and communications equipment manufacturing industry has reached 434890.97 million Yuan, far ahead of other categories of high-tech industries. Then, there are some questions we should think. How does the electronic and communication equipment manufacturing industry stand out of many high-tech industries? What are key factors it can develop better than other industries, and what countermeasures can be offered to the development of other industries? Compared with the predecessors, the paper conducts a study that compares the electronic and communication equipment manufacturing industry and other high-tech industries, covering all sectors of high-tech industries. In this paper, the development status of electronic and communication equipment manufacturing industry and other high and new technology industries is evaluated profoundly. The key factors that the electronic communication equipment manufacturing industry developed well are summed up.

II. OVERVIEW OF MANUFACTURING OF ELECTRONIC COMMUNICATION EQUIPMENT

A. *Factors affecting the manufacturing of electronic and communications equipment*

Research on innovation management by Chen Jin shows that innovation is becoming an endless research topic, which is the mainstream research direction of technological economics. On the basis of this, there are three reasons for the innovation and influence factors of electronic and communication equipment manufacturing industry from the angle of innovation. ①The main innovation is the organization with innovative technology, innovative knowledge and other related innovative ability. Electronic and communication equipment manufacturing industry itself emphasizes innovation. It takes innovation technology as the core competitive power and transforms it into products and services enterprises. ②The process of innovation shows the complex relationship of the economic operation mechanism, the electronic and communication equipment manufacturing industry is in such a complex relationship. Electronic and communication equipment manufacturing industry is one of the categories of the high-tech industries, the core technology of high-tech industry has the characteristics that great development difficulty, long period, difficult to break, difficult to replicate and the high efficiency of economic conversion, which determines the internal relations between subjects is in a complex network. As one of the main parts of the electronic and communication equipment manufacturing industry, it is necessary to emphasize the cooperative symbiosis between the internal and external parts of the system. ③From the initial concept to "industry 4.0", what innovation pursues is the coordination, stability and sustainable development within the system. The electronics and communications equipment manufacturing industry is also faced with a number of risks

and challenges while gaining good government support. Studying electronics and communication equipment manufacturing industry from an innovative perspective can reflect the impact of input, factor flow and output factors on it.

B. Innovation factor system construction of electronic and communication equipment manufacturing industry

TABLE I. HIGH-TECH INDUSTRY, INNOVATION FACTOR, INDEX SYSTEM

First level index	Two level index	Three level index
Innovation potential	Material potential	Number of enterprises
		Number of R & D institutions
		Number of new product development projects
		Number of projects completed and put into operation
	Fund potential	New fixed assets
		Amount of investment
		Total profit
		Main business income
Innovation flow	Technology flow	Expenditure on the purchase of domestic technical funds
		Technology import expenditure
	Fund flow	Sales revenue of new products
Innovative state	Capital status	Internal expenditure on research and experiment funds
		Research and experimental project funding
	Technical state	Number of patent applications
	Technical state	The time equivalent of the researchers and the experimenters was equivalent

The article get 22 indicators from "China Statistical Yearbook of science and technology", including the number of enterprises, the main business income, total profits, export delivery value, the number of research institutions and R&D personnel or full time equivalent, R&D internal expenditures, R&D projects and new product development projects and new product development expenditure, new product sales income, the number of patent applications and the number of invention patents, technology introduction, digestion and absorption of expenditure, buy domestic technology expenditures, technical renovation expenditures, the number of construction projects, the completion of all projects, investment, new fixed assets and R&D project funds. The validity of these indexes was analyzed by SPSS software, 7 indexes with low validity were excluded, and the 15 remaining indexes were combined to achieve the highest validity. These 15 indicators are constructed according to the three dimensions of state, flow and potential. The index system of industry innovation impact factors is shown in Table 1.

III. ANALYSIS OF INFLUENCING FACTORS OF ELECTRONIC COMMUNICATION EQUIPMENT MANUFACTURING INDUSTRY

A. Factor analysis of electronic and communication equipment manufacturing

On the basis of constructing the index system of influencing factors of innovation in industry, this paper selects the relevant data of 5 major categories of 25 high-tech industries in the "statistical yearbook of Chinese science and technology" in 2015, and making factor analysis. The analysis results are shown in table 2.

TABLE II. FACTOR EVALUATION TABLE OF HIGH AND NEW TECHNOLOGY INDUSTRY

Industry	F1	F2	F3	F
Electronic and communication equipment manufacturing industry	-48384351.91	43603160.13	65669534.33	4902086.472
Communication equipment manufacturing	-24127846.23	22463248.98	32041202.35	2454228.723
Communication terminal equipment manufacturing	-14435319.07	15787002.72	16869552.34	1500905.204
Computer office equipment manufacturing industry	-9474675.162	9418846.522	11969551.55	965344.5186
Communication system equipment manufacturing	-9692527.163	6676246.262	15171650.01	953323.5185
Pharmaceutical manufacturing	-9078079.706	7165564.682	13352328.33	914687.6632
Electronic device manufacturing	-7800108.137	6640445.392	10968625.28	785104.5377
Computer manufacturing	-7093719.519	7364701.559	8648752.98	725494.7186
Electronic component manufacturing	-5761632.756	4930273.52	8081361.18	581273.9049
Audiovisual equipment manufacturing	-5275085.86	5026566.58	6883901.643	536123.8768
Chemical manufacturing	-4850816.441	3873165.397	7092751.815	489724.9195
Medical instrument and instrument manufacture	-4292031.124	3115489.592	6578901.502	428481.8993
Instrument manufacturing	-3471083.055	2647506.869	5191609.382	347405.523
Aerospace equipment manufacturing industry	-2757621.87	1918345.828	4303279.512	272814.2878
Aircraft manufacturing	-2293525.492	1691319.691	3483268.323	227756.9685
Proprietary Chinese medicine production	-2112682.178	1815539.178	2958896.093	214037.3661
Other electronic equipment manufacturing	-1924352.762	1646963.022	2696977.247	193677.418
Integrated circuit manufacturing	-1521092.514	973904.9947	2456913.835	149488.0634
Bio pharmaceutical manufacturing	-1033551.564	625979.7635	1707628.506	101865.9769
Medical instrument manufacturing	-820948.0696	467982.7233	1387292.12	81076.37605
Manufacture of radio and television equipment	-736367.9425	545908.4205	1116241.874	73344.0939
Computer parts manufacturing	-517576.687	426261.4374	742632.9077	52079.31009
Semiconductor discrete device fabrication	-263112.82	186862.3769	407344.818	26209.50474
Spacecraft manufacturing	-160614.4214	26479.96526	334918.9113	14893.44598
Manufacture of electronic vacuum devices	-58380.23093	38347.78179	93529.06139	5796.010503

B. Comparative evaluation of electronic and communication equipment manufacturing industry and other high-tech industries

Compare the development of 5 major high-tech industries, from the weight coefficient, the F1 coefficient is larger, and its corresponding ranking is higher, but from the comprehensive score ranking results, F1 is negative, resulting in the higher the score, the lower the overall ranking. This shows that the process of innovation investment and output in high-tech industry has its own problem, which is the low efficiency of innovation transformation and the low validity. From the results of the study, the innovation potential F1 of electronic and communication equipment manufacturing industry has the lowest score. The highest score is innovation flow F2 and innovative F3.It is shown that compared to other high-tech industries, the capacity of transferring innovation support into innovative results and innovative income is high in electronic and communications equipment manufacturing industry. Based on the composite score of three innovative factors, the development of electronic and communication equipment manufacturing industry is better in comparison with other industries under the influence of these three factors. Zang Xuheng, and other research shows that the electronic and communications equipment manufacturing industry has a stronger influence, which can stimulate social production. So what are the reasons that the electronics and communications equipment manufacturing industry can realize this? In this paper, the article summarizes several factors that make the electronic and communication equipment manufacturing industry achieve better comprehensive development results:(1)From the aspect of innovation potential of high and new technology industry, it fully accesses to external support and reasonable internal support. Xiao Min and Gao Yanmei covered by industry gathering of China electronic and communication equipment manufacturing industry competitiveness shows that electronic and communication equipment manufacturing industry mainly concentrated in the eastern region of the formation of Chinese, greatly boosted the growth of the local economy, which not only benefited from government policy support, but also the result of market choice. The study feedback that electronic and telecommunication equipment manufacturing industry in the high-tech industry innovation need supports form outside, including the support from government, the construction of a relationship between the developments of the industry for the enterprise. At the same time, it also needs the internal support, including industry scale, product innovation, technology innovation, innovative talents etc. input. Similarly, the high-tech industry is the core competitiveness of a region or country,it absorbs the attention of government and all sectors of society. As long as work out the reasonable planning, it can get the support from the government and society. The key lies in reasonable internal support, dealing with the relevant R & D investment, innovation, personnel training, channel development and other relations, under the premise of limited resources.(2)From the aspect of innovation flow of high-tech industry, we should pay attention to the efficiency and validity of innovation transformation. The study find that the expenses for the purchase of domestic technology funds and the technology import expenditure of the electronic and communication equipment manufacturing industry are high. At the same time, sales of new products are also higher. It can be concluded that, if necessary, high-tech industries can introduce technology to reduce their R & D time, and enhance the efficiency of research and development of the industry. Each industry may be skilled in some aspects, and weakness in some aspects. The introduction of technology is a kind of way, which can be more suitable for the industry that can absorb technology .If the technology absorption capacity is not up to expectations, we can choose to cooperate with other industries, technology outsourcing. It is also a strategy to improve the efficiency of a innovation. Liu Wei, through the research on the convergence trend of high-tech industry technological innovation, shows that human resources are one of the significant factors contributing to its convergence. Many studies have found that, in the long run, the key lies in the reserve and cultivation of creative talents. Although the process is relatively long, the validity is relatively high.(3)From the aspect of innovation state of high-tech industry, the core lies in the market orientation. Sun Bing and Zhang Weifeng found that the market environment will have a very important stimulating effect on technological innovation through the study of the development of the electronic and communication equipment manufacturing industry. The study also found that the mismatch problem between the support for innovation and innovation output of high-tech industries. Developing the market demand in the right way is the core to improving the innovative achievements, increasing the ability of innovation output, and realizing the balance between innovation support and innovation output. After understanding the needs of the market, it can precede related industrial planning, research and development, production and other activities. The consumer is the main role in market demand. High-tech industry needs to have a clear positioning of the consumer groups. Through the investigation, we can fully understand and excavation the needs of consumers' interests, leading the consumer demand, making consumers play an important role in the economy, realizing effective production

IV. CONCLUSION

The core point of the above research is to realize the transformation of innovation support and innovation output into effective results of high-tech industry, which is not only the pursuit of innovation results, but also the control of the innovation process. As far as innovation is concerned, the effective output of innovative products lies mainly in the process of innovation, which is reflected in the effective input of innovative capital. The key to ensure the effective output of innovative products is innovation technology, and the key to ensure the effective input of innovation capital is the timeliness of capital investment. Other high-tech industries should learn from the electronic communications equipment and manufacturing industry how to grasp the two parts of the relationship.

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