

Technology Market Development: A Literature Review

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Abstract—Science and technology is an important driving force for economic development, and it continues to affect the development model of the world economy. With the advent of the era of the knowledge economy, major changes have taken place in the form and content of international competition. Science and technology have played a leading role in the economic development of various countries and become a key means for countries to participate in international competition. This paper reviews the research on the "intermediary role" of technology market, technology market and technology innovation, technology market and economic growth, and factors that promote the development of technology market through a review of existing literature, and puts forward relevant suggestions.

Index Terms—Technology market; technology innovation; economy ;literature review ;policy

I. INTRODUCCION

China has undergone 40 years of reform and development, and its economy has grown rapidly, but its ability to innovate in science and technology is relatively low. Key core technologies rely on foreign imports instead of funding for research and development, and intellectual property technologies are relatively lacking. In response, the Chinese government promulgated the "Outline of the National Medium- and Long-Term Scientific and Technological Development Plan 2006-2020" in 2006, which clearly proposed the strategic goal of building an innovative country. Among them, the construction of technology markets was promoted as an important policy measure and.

In fact, the concept of "technical market" was first proposed by the central government in 1985. In the "Decision on the Reform of the Scientific and Technological System" issued by the state, the commercialization of scientific and technological achievements and the vigorous development of the technological market were clearly proposed. State Council's Interim Provisions on Technology Transfer. The development of the technology market plays an important role in innovation. It provides a perfect service environment for the realization of innovation and is an important platform for the industrialization of innovation results and commercial commerce. Practices in many countries have shown that a high-efficiency technology market can promote research and development marketization, commercialization of scientific and technological achievements, and high-tech

industrialization, can effectively promote the rational allocation of innovation resources, and promote technological innovation and diffusion of innovation among the subjects of innovation. Therefore, giving play to the role of innovation bodies such as scientific research institutions, universities, and enterprises, improving the effective operation mechanism of the technology market, accelerating the flow of knowledge and technology transfer, has an important role in building an innovative country.

With the rise of the domestic technology market, domestic scholars' research on the technology market has also risen, including research on the specificity of technology as a commodity, the definition of the technology market, problems and development suggestions for the technology market, technology market development measures, technology Research on the role and influence of transfer and technology markets. Here, this article mainly reviews the research on the "intermediary role" of technology market, technology market and technology innovation, technology market and economic growth, and factors that promote the development of technology market.

II. RESERACH ON THE "INTERMEDIARY ROLE" OF TECHNOLOGY MARKET

With the establishment of China's market economic system, the technology market, as an important factor market, has played an increasingly important role in promoting the construction of China's market system and economic development. Some scholars in China have begun to notice that the technology market in the economic system does not simply play the role of a factor market, but rather acts as an "intermediate bridge" for technology transactions. For example, Liu believes that due to the large "incompleteness" of technology in the process of flow, transfer, and introduction, the intermediary role of the technology market has become particularly important. Technology service agencies help technology buyers and sellers obtain real and effective information through technical evaluation and information aggregation of products purchased by enterprises, reducing information costs and risks, and increasing technology transaction rates [1]. Dong (2005) analyzed the generation mechanism of adverse selection in China's technology transactions from the perspective of transaction cost theory, and concluded that the intervention of technology intermediaries can improve

the transaction efficiency of technology markets and promote the transformation of technological results [2]. Zhang and Chen believe that China's technology market type is divided into seven types according to function: intermediary service type, middlemen type, technology enterprise type, technology-production combination type, direct trade type, technology-commodity concurrent type and comprehensive type. Types, technology markets with different functional types have their own business scope and economic income nature, and put forward an administrative management model to promote the development of technology markets [3]. Chen believes that the technology market has an efficient resource allocation function, a sound and perfect venture investment system function, and a complete information and value discovery function [4]. Bi believes that the same successful experience of innovative countries is that they focus on the role of science and technology intermediaries as a bridge between science and technology and the economy. In particular, they focus on the core role of the technology factor market in the integration of innovation resources. Technology market trading platform [5]. Du explained the status and role of science and technology intermediary agencies in the national technology innovation system, analyzed the main service targets of science and technology intermediaries, analyzed the development status and existing problems of science and technology intermediaries, and discussed the technology intermediary agencies to the society. The institutional issues in the process of transformation of public welfare institutions, and put forward the functions, mechanisms and operating modes that science and technology intermediaries should have in the national technology innovation system, as well as strategic countermeasures and development measures [6].

III. THE RELATIONSHIP BETWEEN TECHNOLOGY MARKET AND TECHNOLOGY INNOVATION

Can the development of technology markets promote technological innovation? In this regard, different scholars have carried out research. Xu studied the development of the technology market in the automotive industry and believed that under the background of increasingly diversified external technology sources, companies can obtain external technologies through the technology market and effectively integrate with independent development technologies to better achieve independent innovation. [7]. Lu et al. believe that innovation input and technology transaction are important factors affecting the innovation ability of the industry. Only by active technology transaction market can the introduction and transformation of scientific research results be improved and high-tech industrialization can be achieved [8]. Shen and Wu examined the technology trading behavior in the context of industry-university-research cooperation by using a signal game model. They believed that the technical cooperation transaction between universities and

enterprises is conducive to promoting technological innovation, and also promotes the transformation of scientific and technological achievements of universities. Innovation [9]. Liu et al. introduced the technology transaction variables into the knowledge production function, examined the relationship between the technology transaction network, knowledge absorption capacity, and regional innovation ability, and believed that the regional innovation ability can be improved by embedding the interregional technology transaction network [10]. Liu applied the method of time series dynamic equilibrium relationship analysis, and carried out co-integration analysis and causality test on the relevant data variables of China's annual technology market development and independent innovation capability. They believed that there was a strong correlation between the two, and the technology market Development plays an irreplaceable role in promoting independent innovation and building a national innovation system [11]. Xing et al. found a technology model under the cumulative innovation framework, and found that the technology licensing method can not only directly save and replace its own R & D, but also promote enterprises R&D investment in new technologies by improving the technological capabilities of the host country's enterprises [12]. Hao used Shanxi Province as an example to study the relationship between technology market and technology innovation using co-integration test, error correction model, Granger causality test, impulse response function and analysis of variance analysis of co-integration theory. The results show that The technological market and technological innovation interact and restrict each other, but in contrast, the promotion of technological innovation on the technological market is greater than the promotion of technological market on technological innovation [13]. Kaiming used co-integration analysis to test the relationship between technology market and technology innovation, and used regression analysis to make an empirical measurement of the relevance of technology market development to China's technology innovation, and concluded that China's technology market development There is a long-term dynamic equilibrium relationship with technological innovation. The development of the technological market has a promoting effect on the improvement of technological innovation capabilities [14]. Ye and Liu believe that the technology market dredges the "infarction" of knowledge innovation and technology innovation. The development of the technology market has promoted the government's fiscal incentive effect and promoted the efficiency of scientific and technological innovation [15]. Zhuang and Duan used the Chinese provincial panel data from 2002 to 2015 to study the impact of technology market on innovation. The research believes that the development of technology market has promoted regional innovation, and the driving role has regional differences. The driving role of developed areas is more Significantly [16]. Based on empirical analysis, Zhao believes that the principle of endogenous growth of technology in the technology

market, the principle of technology diffusion, and the fundamental role of the market in resource allocation have promoted regional innovation capabilities [17]. Zhao and Li considered the technology market transaction panel data of 30 provinces in mainland China from 2006 to 2010, and concluded that the development of technology market has promoted the enhancement of regional innovation capabilities [18].

IV. THE RELATIONSHIP BETWEEN TECHNOLOGY MARKET AND ECONOMIC GROWTH

In terms of technology market development and economic growth research, domestic and foreign scholars mainly combine technology endogenous growth theory to analyze the influence of technology transfer activities or technology markets on economic growth through empirical research. At present, scholars have two views on the relationship between the two. One view is that technological market development can positively promote economic growth. For example, Xu et al. believed that research was carried out under the framework of a dynamic stochastic general equilibrium model, and that technology diffusion and investment were important factors to promote the economy [19]. Shen and Fu studied the spillover effect of technological knowledge of foreign-funded enterprises, and the results showed that the technological diffusion and transfer of foreign-funded enterprises can help improve the quality of economic growth of domestic-funded enterprises [20]. Peng and Yi used the Moran index to analyze the spatiotemporal distribution characteristics of China's technology market development, and used a spatial error model to explore the role of technology market development in promoting economic growth. The study found that there is significant positive space for the development of technology markets in each province Relationship [21]. Chen analyzed the mechanism of technology transfer to promote economic growth, and used qualitative analysis methods to analyze the economic benefits of technology transfer in China from the international, national, regional and enterprise levels, and applied quantitative analysis methods. Construct China's technology transfer development index and economic growth index, and empirically study the relationship between technology transfer and economic growth [22]. Another view is that there is a long-term equilibrium relationship between technological market development and economic growth. For example, Pan and Liu based on the statistical data from 1987 to 2002 released by the National Bureau of Statistics and used the co-integration analysis method in econometrics to believe that there is a long-term equilibrium between the development of China's technology market and economic growth. Relationship [23]. Jin used the co-integration analysis method in econometrics to conduct an empirical study on the relationship between the development of China's technology market and economic growth, and found that there is a long-term stable equilibrium relationship and a causal relationship between the two

[24]. Huang et al. based on Shanghai GDP and technology transfer data, and used cointegration analysis to conclude that there is a long-term stable equilibrium relationship between Shanghai's technology transfer and economic growth [25]. Yang and Zhao used co-integration test, Granger causality test, impulse response function and variance decomposition, and other methods to examine the relationship between technology market and economic growth. The test results show that there is a long-term equilibrium between the two. Relationship [26]. Based on scientific and technological statistics from 1987 to 2009, Zhang used the co-integration analysis method in econometrics to believe that there is a long-term equilibrium relationship between the development of technology markets and economic growth [27].

V. RESEARCH ON FACTORS PROMOTING THE DEVELOPMENT OF TECHNOLOGY MARKET

With the promotion of the role of technology markets in economic and social development, some foreign scholars have shifted the focus of technology market research from whether it should exist to how to develop rapidly. Starting from finding factors that restrict the development of technology markets, they have proposed ways to promote the development of technology markets. Countermeasures. Gans (2000) analyzed the mechanism of clarifying technological property rights and protecting small enterprises from imitation and patent deprivation of large enterprises, and improving the absolute return on innovation. Studies have shown that the intellectual property system not only improves the tradability of technology products, but also improves the efficiency of technology transactions, stimulates the development of technology marketization transactions, and promotes the development of technology markets [28]. Podolny (1994) research found that the uncertainty and lack of information in technology transactions has prompted technology buyers to pay more attention to the potential technology providers than the quality of the transaction technology itself [29]. Guilhon (2001) explained the necessity of establishing trust mechanisms and relationship networks in the technology market. Frequent transactions between technology producers and users based on common beliefs help to form long-term cooperative relationships. The formation of adverse selection and moral hazard behaviors that help limit opportunistic behaviors [30]. Zhang and Lin calculated the statistical results of the regression model and concluded that there are many factors affecting the development of the technology market. Among them, the level of human capital and the policies of local governments are important influencing factors. In addition, economically developed regions have large market sizes, Market development has a promoting role [31]. Lei and Lin believe that China's technology market is lacking in institutional mechanisms, the implementation of preferential policies, statistical work and supervision and management systems, which restrict

the development of the technology market [32]. Zhang believes that the details of intellectual property rights are the prerequisite for ensuring the operation of the technology market, which directly affects the efficiency of the operation of the technology market, and further has an important impact on important issues such as the conversion rate of scientific and technological achievements and independent innovation capabilities [33]. Gu and Jiang believed that the regional innovation ability can promote the transaction efficiency of the technology market. Through the invention type patent and the input of regional scientific and technological personnel, the transaction efficiency of the technology-based intermediary transaction has been greatly increased [34]. Fu believes that the existing management system issues, the mechanical defects of the development of the technology market, the conceptual obstacles to the development of the technology market, and the international technology transfer are important obstacles to the development of the technology market [35]. Zhang et al. conducted a regression analysis on the statistical data of science and technology from 2010 to 2014 and concluded that the investment in research and development funds and human capital investment had an important effect on the activity of the technology market [36]. Lu et al. studied the development of the technology market in Chongqing, and considered that R & D investment and patent output are important factors affecting the development of the technology market [37].

VI. CONCLUSION

After sorting out related literatures, this paper can draw the following conclusions: First, the development of technology markets has played an intermediary role in technology transaction buying and selling, which can improve the success rate of technology transactions, and can only improve the introduction and transformation of scientific research results, and realize high-tech industrialization. The development of the technology market can promote technological innovation, which has a strong role in promoting independent industrial research and development, and the two affect each other. Scholars have two views on the relationship between technology markets and economic development. One is the positive role of promoting the development of technology markets, which can effectively promote the regional economy. The second is a long-term equilibrium relationship. The main point of view is that there is a long-term equilibrium relationship between technological market development and economic growth, and there is a certain lag effect. The development of the technology market is mainly constrained by factors such as unclear intellectual property rights and mismatched technology transaction information.

In this regard, this article believes that technology as a production factor and technology market as a factor market need to play the role of "intermediary bridge", play the basic role of market mechanism in resource allocation, and enhance regional innovation capacity and

economic level. In this regard, the government needs to better stimulate technology supply and demand side transactions to promote the development of technology markets. Innovative entities such as enterprises, universities, research institutes, etc. serve the local government according to their own advantages and adapt to local conditions, and promote the integration of local production, education, and research. In addition, it is necessary to strengthen the protection of intellectual property rights, suggest and improve the exchange mechanism of intellectual property information, severely crack down on obtaining patents and involving patent infringement, strengthen law enforcement and investigation, strengthen public supervision, and provide good technology market development. Social environment.

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