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The Current Situation, Problems and Countermeasures of Technology Transaction Market in Jinan

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Abstract

Technology transaction market is an important part of the market economy. The level of technology market transaction has increasingly become an important indicator to measure the strength of science and technology among different regions. "'13th Five-Year' National Science and Technology Innovation Plan" requires that the country should enhance the level of the service of science comprehensive. As the global technology market becoming active continually, Jinan has put the goal of "Build regional science and technology innovation center," in order to reach the technology and innovation new heights between Beijing and Shanghai, becoming the domestic first-class and the internationally renowned technology innovation center, and building up an innovative city firstly. This paper takes Jinan technology market as the research object, uses the method of qualitative analysis, quantitative analysis and comparative analysis, makes a statistical analysis for the current technology transformation situation and the existing problems in Jinan. The conclusion is that Jinan technology transaction market develops slowly and there is still a large space to improve. In the end, the research puts forward the corresponding countermeasures and suggestions.

Key words: Technology transaction market; Current situation problems; Countermeasures and suggestions

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1. RESEARCH BACKGROUND

In recent years, technology transaction market has developed rapidly in China. The level of technology market transaction has increasingly become an important indicator to measure the strength of science and technology among different regions.

The 18th National Congress of the Communist Party of China (CPC) points out: "To implement innovation-driven development strategy. Scientific and technological innovation is the strategic support for improving the social productive forces and comprehensive national strength, and it must be placed at the core of the overall development in the country." Technology transaction market is the main way to achieve the industrialization of S&T innovation, and it is an important way to transform the innovation product into social productive forces, which play an important role in the rational allocation of technical resources. "'the 13th Five-Year' National Science and Technology Innovation Plan" requires "enhancing the level of development of science and technology service industry," "focusing on the development of research exploitation, technology transfer, tests and certification, entrepreneurship incubation, intellectual property rights, technology consulting and other industries"; at the same time, the plan also requires perfecting the mechanism of scientific and technological achievements transaction. From here we see that governments have taken more and more care about technology transaction market, and then enterprises also have realized the huge economic benefits behind the science and technology.

As the capital city of Shandong Province, Jinan has many unique advantages in territory, policy, talents and so on. "The 13th Five-Year" is the critical period for Jinan to transform the mode of economic development rapidly. "Jinan Regional Science and Technology Innovation Center for the Construction of Three-Year Target System and 2016 Goals and Tasks" proposes the goal of Jinan "to build a regional scientific and technological innovation center," "to create the technology and innovation new heights between Beijing and Shanghai, to become the domestic first-class and the internationally renowned technology innovation center," "to build up an innovative city firstly." However, in recent years, Jinan technology transaction market has developed stagnation, compared to other large cities in China there is still a big gap. So the paper analyzes the development of Jinan's technology transaction market, and points out the problems existing in Jinan, and then puts forward corresponding countermeasures and suggestions.

2. LITERATURE REVIEW

2.1 Research on the Regional Technology Transaction Market

With the development of technology market, more and more scholars pay attention to the regional technology transaction market. The normally researches can be divided into two categories, the factors that impact on the formation of regional technology transaction market and the relationship among different regional technology transaction markets. Chen (2003) says that technology property rights transaction market in China has formed obvious regional characteristics, and it has appeared five models, "Wuhan - incubator model," "Shanghai model," "Zhongguancun mode," "Guangzhou - boutique mode" and "Shenzhen - entrepreneurship + listed company model." About the crucial influence factors of pattern in regional technology transaction, Zhao (2012) thinks that the technology input has a significant impact on the pattern of technology transactions, while the technology output has a significant impact on technology produce. Zhao (2014) believes that no matter inputting or outputting of the technology market, both of them have positive influence on local innovation capability. It's merely that there is a greater impact on output. Zhang (2013) researches the regional innovation situation in the Bohai economic circle which based on the applications and the authorizations of innovation patents, he points out that the main reason for the regional difference of the technical innovation capacity is the per capita GDP. In recent years, the regional technical innovation of the Bohai economic circle shows a downward trend, and the factor of technical market turnover presents a negative regional technological innovation. Liu (2014) talks about that the inter-regional technology transaction network has a positive influence on the regional innovation produce. And the ability of the absorption of knowledge can regulate the regional technology network and technology output. Ji (2016) believes that the two most important influence factors of regional transaction market activities are the research capacity factors and the policy factors.

In summary, existing researches analyze the spatial characteristics and the structure patterns of regional technology transaction market, and analyze the law of technology transfer in China typical area.

2.2 Research on the Current Situation and Current Problems of Technology Transaction Market

These years technology transaction market in China develops rapidly recently, but there are also many problems. According to the problems in China technology transaction market at different times, many scholars do this research and come up with different solutions. Zheng (2009) discusses on the factors that influence the development of technology market in China through two aspects which are environment and market. The research analyses three factors of technical requirements, enterprise management and R&D capabilities, market entry barriers, and R&D risk. He points out that the correct identification of influential factors for the analysis of technology market development status is essential. Jin (2009) says that the motive of Chinese technology market is the "demand-driven" not the "technology-driven." Li (2010) believes that information asymmetry can hinder the technology transaction market healthy development seriously in the transaction process. And then, the main reasons for asymmetric information are exogenous factors, cost factors, and knowledge differences. Zhang (2016) particularly talks about that one of the important reasons for the low conversion rate of technology achievements in Shandong province is the multi-level capital market absence. The small and medium-sized high-tech enterprises are much more need technology transaction market to raise fund particularly.

In a word, researchers study on China technology transaction market at different times, provides the theoretical support of the sustainable development of Chinese technology transaction market. In recent years, the researches on Jinan technology transaction market situation are still a blank. Thus, this paper takes Jinan technology transaction market as the object, analyzes the current situation and the problems then puts forward the corresponding countermeasures and suggestions.

3. SITUATION ANALYSIS OF JINAN TECHNOLOGY TRANSACTION MARKET

3.1 Operational Status Analysis of Jinan Technology Transaction Market

Table 1 provided analyzes Jinan technology transaction market the current situation in respect of the technology

transaction turnover in nearly six years. Jinan technology transaction market turnover shows a general increase trend in recent six years. From a total of 1.77 billion yuan of technology transactions in 2010 to 3.099 billion yuan in 2015, the amplification climbed to 75%. It is worth mentioning that from 2010 to 2014 the total turnover of technology transactions grew steadily. From the speed perspective, the year of 2010, 2011 and 2014 had a relatively rapid growth, with the fastest growth reaching a peak of 40%. In the year of 2015, however, a negative growth appeared and the technology transaction turnover also declined. The reasons for the decline are complex. First, the government of Jinan didn't place enough emphasis on it. Second, the scientific research project didn't get enough help. Last but not least, the severe loss of population was one of the key reasons.

Table 1
Jinan Technology Transaction Turnover During 2010 to 2015

	2010	2011	2012	2013	2014	2015
Turnover (billion yuan)	17.7	24.83	26.37	27.68	37.14	30.99
Amplification	27.89%	40.3%	6.24%	4.69%	34.19%	−16.56%
Jinan technology transaction turnover accounted for the proportion of the GDP in Jinan	0.45%	0.56%	0.55%	0.53%	0.64%	0.51%
Jinan technology transaction turnover accounted for the proportion of technology transaction turnover in Shandong province	17.58%	19.65%	25.97%	15.43%	14.90%	10.08%

Data source: Jinan Science & Technology Bureau; Torch High Technology Industry Development Center, Ministry of Science & Technology.

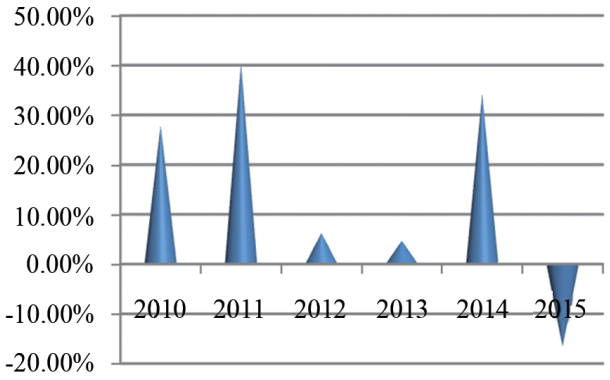

Figure 1
The Amplification of Jinan Technology Transaction turnover During 2010 to 2015
Data source: Jinan Science & Technology Bureau; Torch High Technology Industry Development Center, Ministry of Science & Technology.

Table 1 and Figure 2 reveal a comparison of the proportion of Jinan technology market transaction turnover accounts for the whole technology market transaction turnover in Shandong province. From 17.58% in 2010 to 10.08% in 2015, the proportion experiences a process of accelerated rise successively and a process of sustained decline. During the period between 2010 and 2012, the proportion has increased, before a period of decreased in 2013. Thus, compared to other cities in Shandong, Jinan technology market is lack of the potential of continuous development and the energetic.

Table 1 and Figure 2 show the proportion of Jinan technology transaction turnover accounts for the proportion of Jinan GDP. In recent six years, the proportion remained very low, from 0.45% to 0.51%, the overall trends didn't improve a lot. The contribution of technology transaction turnover to GDP is very low in Jinan, and there is still very large space to improve.

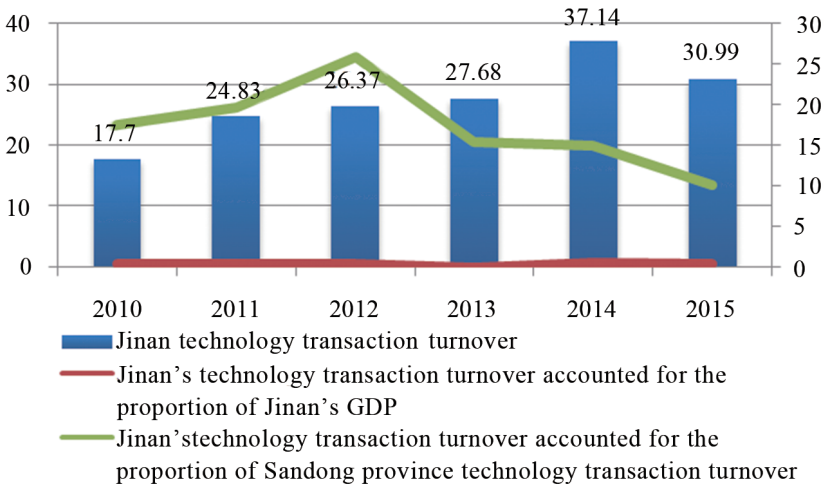

Figure 2
Jinan Technology Transaction Turnover During 2010 to 2015
Data source: Jinan Science & Technology Bureau; Torch High Technology Industry Development Center, Ministry of Science & Technology.

Table 2 and Figure 3 analyze the Jinan technology transaction market the current situation in the past six years through technology transaction volume. From a total of 2,956 in 2010 to 3,594 in 2015, the amplification saw a marginal increase in the whole. The amplification has a striking fluctuation in the year of 2011 and the year of 2014. In 2013, however, the amplification reached a peak of 11.11%.

Table 2
Jinan Technology Transaction Volume During 2010 to 2015

	2010	2011	2012	2013	2014	2015
Technology transaction volume	2956	2947	3113	3459	3327	3594
Amplification	9.04%	−0.3%	5.63%	11.11%	−3.82%	8.03%
Unit technology transaction turnover in Jinan (million yuan)	59.88	83.41	84.70	80.02	116.63	86.23

Data source: Jinan Science & Technology Bureau; Torch High Technology Industry Development Center, Ministry of Science & Technology.

With the annual transaction turnover divided by the annual transaction volume, another important indicator can be reached, which measures the level of technology market, the average annual turnover of each contract technology.

Formula: $\overline{X} = \frac{A_X}{N}$.

Unit Technology Transaction Turnover ($\overline{X}$)=Technology Transaction Turnover(A_x)÷Technology Transaction Turnover (N)

Unit technology transaction turnover represents the average transaction turnover per contract in a year. It measures the average level of technology transaction market in a city. The much higher of the unit the technology transaction turnover represents the much more value of the unit technology transaction contract.

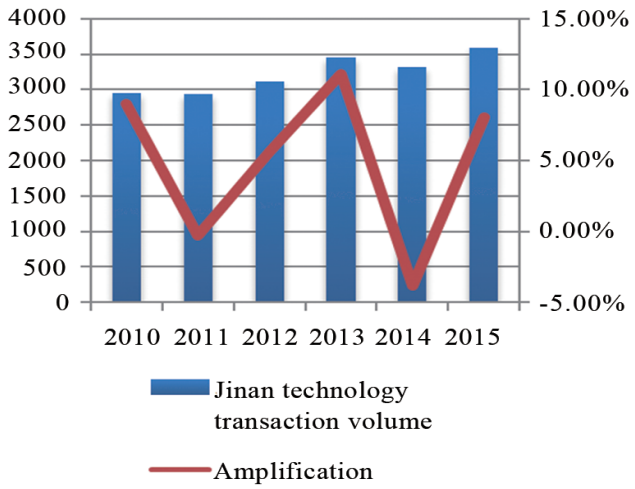

Figure 3
Jinan Technology Transaction Volume During 2012 to 2015

Data source: Jinan Science & Technology Bureau Torch High Technology Industry Development Center, Ministry of Science & Technology.

In Table 2 and Figure 4, Jinan unit technology transaction turnover from a total of 59.88 million yuan in 2010 to 86.23 million yuan in 2015, the total amplification is 44%, and peak volume up to 116.63 million yuan in 2014. Jinan unit technology transaction turnover shows a fluctuating upward trend.

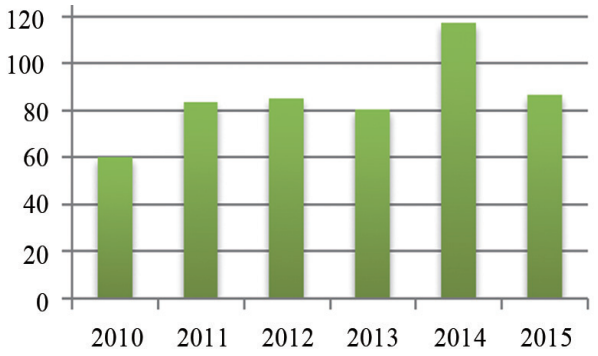

Figure 4
Jinan Unit Technology Transaction Turnover During 2012 to 2015

Data source: Jinan Science & Technology Bureau Torch High Technology Industry Development Center, Ministry of Science & Technology.

The technology transaction turnover in Jinan rises continuously, but the amplification of transaction volume in Jinan doesn't change much. In this case, the unit technology transaction turnover rises obviously. The result shows that unit technology transaction achievement in the process of Jinan technology market is much more valuable. Jinan's scientific and technological transaction becomes more reasonable, and the gold content of technology research also increased, this is indeed a welcome phenomenon.

In terms of technology transaction market turnover and volume, this paper selects the top five cities in China (Beijing, Shanghai, Xian, Wuhan and Shenzhen) and compares them with Jinan in turnover and volume, and then analyzes the present development situation of Jinan technology transaction market. At present, the most active areas in China technology transaction market is the Beijing-Tianjin-Hebei region, the Yangtze River Delta region and the Pearl River Delta region, It's is worth mentioning that Beijing, Shanghai, Guangzhou and Shenzhen play a significant radiation role in regional.