ISCTE Business School
Instituto Universitário de Lisboa

The Dilemma of Intellectual Property Transaction and Mechanism Optimizing in China

Kong Junmin

Thesis submitted as partial requirement for the conferral of the degree of

Doctor of Management

Supervisor:

Professor Sandro Mendonça, Professor, ISCTE University Institute of Lisbon

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April, 2017

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ESSAYS ON INTERNATIONAL EQUITY MARKETS

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- Spine –

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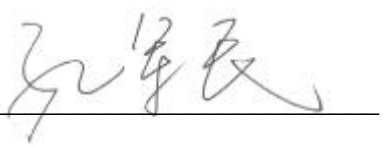

Abstract

This Thesis focuses on the difficulties and solutions regarding intellectual property (IP) transactions. High transaction costs and low exchange values in the context of sporadic trades and massive IP availability constitute a hurdle when a country seeks to realize the full potential of knowledge and innovation as part of its development strategy. The purpose of this Thesis is to address these challenges and to contribute to achieving workable solutions.

This Thesis is based on a survey of China's economic situation, IP institutional system, IP application development, and the status of IP transaction. To move forward, it puts forward the following research questions: "What are the suitable mechanisms of IP transaction to reduce transaction costs and maximize exchange value? And, how should we optimize the mechanisms to solve the dilemma of IP transaction?"

Also, the Thesis develops conceptual discussion of IP transactions consisting of transaction subjects, objects and processes. This perspective is compatible with practical requirements and recent theoretical advances. Issues on the take-off and trends of IP transactions in China are reviewed, and requirements on IP tradability, transaction pattern and evaluation are analyzed.

This Thesis implements empirical research of trademark transactions, studies case study information on IP platforms, and analyzes the factors influencing trademark transaction price. A rich array of experience regarding patent transaction mechanisms is summarized.

Finally, this Thesis argues that a feasible detailed solution can be designed, named "O3" IP transaction mechanism. Three strands of policy suggestions are given to enhance IP transactions by optimizing transaction mechanisms.

Keywords: IP Transaction Mechanisms, Transaction Costs, E-commerce, China

JEL Classification: D23, K11

Resumo

A presente Tese foca-se nos problemas das transacções envolvendo propriedade industrial (PI), que se prendem com a raridade do comércio deste tipo de activos em contraste com a sua abundância massiva. Duas perguntas articulam as inquietações de pesquisa desta Tese: Como diminuir os custos de transacção em mercados de PI? Como maximizar o valor dos ganhos deste tipo de actividade? A Tese revê as fontes destas dificuldades e procura perspectivar soluções técnicas e económicas.

Em primeiro lugar, através de uma introdução à da economia da China por via da descrição do sistema da China de PI e das tendências recentes a Tese dá um contexto para a abordagem às perguntas de investigação.

Posteriormente, o fenómeno das transações de PI são revistas através apreciações teóricas e de observações sobre aplicações concretas de experiências reais.

Em seguida, um estudo empírico das transações de marcas é realizado bem como um estudo de caso sobre as várias soluções que existem em termos de operações de negócio em torno da PIs. Um modelo econométrico é usado para analisar os factores que afectam as condições de transação de marcas. Um estudo qualitativo sobre dinâmicas de troca de patentes em contexto chinês e estrangeiro permite mostrar e comparar as características-chave das plataformas de transacção existentes.

Com base nos resultados conceptuais, empíricos quantitativos e empíricos qualitativos elaborados a Tese explora uma solução de comércio designada "O3" e propõe este como modelo-base para discussão de políticas favoráveis à transacção de PI.

Palavras-chave: mecanismos de transação de propriedade intelectual, custos de transação, comércio electrónico, China

JEL Classificação: D23, K11

Acknowledgements

The completion of this Thesis also means the end of my doctoral journey. Looking back on these years of my study, I cannot help but sighing with emotion. More than ten years ago, I took the courses of EMBA at the School of Management and Economics of the University of Electronic Science and Technology of China, establishing a close relation with the university. I have 20 years of experience in IP and began to pay attention to Intellectual Property (IP) transactions the moment I entered this field. Therefore, I commenced the construction of a trademark transaction website in 2002, which is called China Trademark Supermarket Website. As of now, the website has become the No.1 platform in terms of the agency for the volume of trademark transactions for 15 consecutive years. Such success inspires me to summarize relevant experience and conduct an in-depth exploration of IP transaction, which became the motivation for me to write this Thesis.

Firstly, I would like to thank my supervisors, Professor Sandro Mendonça and Professor Xiao Yangao. Professor Sandro Mendonça has both wisdom and a strong sense of humor. He pointed out the research direction of this Thesis and gave detailed suggestions on each chapter for improving this Thesis, the innovation research, and even the translation. Moreover, I should mention that I completed the EMBA Thesis under Professor Xiao's guidance more than ten years ago. The EMBA Thesis was focused on the strategic positioning, market identification, and market development of the China Trademark Supermarket Website.

Secondly, I would like to extend my thanks to all the teachers of ISCTE and UESTC. They taught me not only the professional knowledge, but also how to learn. Thanks should also be presented to Professor Virginia Trigo, Director of the Chinese Program at ISCTE, and Professor Wen Xiao, IDMgt Project Director of UESTC. They informed me of, and explained to me, the relevant situation in a timely manner during the writing of this Thesis with respect to the dissertation proposal, replies of the mid-term report, the relevant arrangement and requirements. Their suggestions helped me get rid of a lot of trouble, so that I could devote myself to the research.

Last but not least, special thanks should be given to my family. The completion of this Thesis cannot be separated from their understanding, support, encouragement and assistance. It is them who give the significance to what I have done. And it is them who gave me the courage and confidence to make progress.

Contents

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List of Abbreviations

B2B	Business-to-Business
B2C	Business-to-Customer
C2C	Customer-to-Customer
CFR	Code of Federal Regulations
CPC	Communist Party of China
DCF	Discounted Cash Flow
EViews	Econometric Views
IP	Intellectual Property
IPOS	Intellectual Property One-stop Service
IPXI	Intellectual Property Exchange International
IV	Intellectual Ventures
O2O	Online-to-Offline
O3	Online-Offline-Online
OECD	Organization for Economic Cooperation and Development
PRC	People's Republic of China
R&D	Research and Development
SIPO	State Intellectual Property Office
TRIPs	Trade-Related Aspects of Intellectual Property Rights
ULR	Unit License Rights
USPTO	United States Patent and Trademark Office
WACC	Weighted Average Cost of Capital

Chapter 1: Introduction

1.1 Research Background

Research background helps us understand why the Thesis chooses intellectual property (IP) transaction in China as the research subject. The background of IP transaction in China will be analyzed from multiple perspectives, including the status quo of China's economy, the IP environment, the number of IP applications, and the current situation of IP trading in China.

1.1.1 Status Quo of China's Economy and Intellectual Property

The term "Middle-Income Trap" was first put forward by Gill and Kharas (2007), which happens after a period of rapid economic growth, per-capita Gross Domestic Product (GDP) reaches the medium world level. It refers to a kind of situation when an economy is trapped in economic stagnation for a long time, suffers from social problems such as polarization between the rich and the poor, difficulty in industrial upgrading, and obstruction to urbanization. The country enters a phase of stagnant economic development, characterized by frequent occurrence of social conflicts due to the failure to realize transformation of the productive structure and knowledge development. *"Since the 1950s, rapid growth has allowed a significant number of countries to achieve middle-income status. However, very few have made the additional leap needed to become high-income economies"* (Agénor and Canuto, 2015: 641). Many countries in Latin America and Southeast Asia slipped into the "Middle-Income Trap" one after another after making their way to the list of middle-level income countries, some of them have remained at the middle-income level for serveral decades.

Since the Reform and Opening-up, China has realized rapid growth for almost 40 consecutive years by taking advantage of its low labor costs and abundant resources through investment and export. This development model enabled China to catch-up with frontier countries and become the second to enter into the club of economies with over one trillion U.S. dollars in 2014. However, with the change of economic development stages, the driving

force for economic growth also changed, labor costs kept rising, and constraints in such aspects as resources and environment have been increasing. As a result, the traditional development model characterized by high investment, high consumption, and high growth is facing challenges. China's economy faced with the growth dilemma and confronted with "middle-income trap". After analyzing industrial clusters in China, Trigo and Lang (2014) point out that industrial clusters are made up of large concentrations of enterprises mostly in the low end of technological production, mostly manufacturing undifferentiated products and operating through price competition. This status is in need of transformation. Institutional and original technological progress is key to the sustainable development of middle-income countries. Therefore, in order to avoid economic growth stalling, developing countries must improve government policy, private sector governance and encourage innovation (Zhang, 2013). With the gradual attenuation of demographic dividend, constraints on resource and environment, the economic development model characterized by high input, high consumption, high pollution, low quality, and low efficiency has become unsustainable. It is difficult for China to develop into a high-income country by the present economic development model.

China has undergone profound changes in economy since the Financial Crisis of 2008 (Wang, 2009). Economic growth rate has the trend of decline, according to the statistics from The National Bureau of Statistics (2015), the economic growth rates from 2011 to 2016 are respectively 9.5%, 7.7%, 7.7%, 7.3%, 6.9% and 6.7%. The drop from the previous double-digit high-speed economic growth to the current single-digit medium-speed growth is not caused by the change of economic cycles, but a structural slowdown reflecting that China's economic foundation has been undergoing profound historic changes. Evidence from other countries also show that if a country is unable to change its development model in time, it could meet with stagnation of socio-economic development, and finally fall into the "middle-income trap". To avoid falling into the "middle-income trap" and achieve sustainable development, China must switch the main motive force of economic growth from material factors of production to innovation.

Both the National Science and Technology Conference in 2006 and the 17th Communist Party of China (CPC) National Congress in 2007 pointed out that the development of science and technology shall be closely centered on the central task of socio-economic development, to form a "national innovation system" (Nelson, 1993; Huang and Sharif, 2016) and establish

a market-oriented system for technological innovation. In 2012, the report of the 18th CPC National Congress put forward the innovation-driven development strategy to adapt to China's economic development trends in the future. The 21st Century is an era of knowledge economy, and knowledge becomes the most important factor of various production elements and plays a very important role in the economic growth (Carlsson et al., 2009). As an important part of the knowledge economy era, IP is a strategic resource for economic development and international competitiveness. Wu (2015a: 8) points out that "*Currently, China's economic development has entered into the New Normal, and implementation of the innovation-driven development strategy has become the theme of the era. In China's system of innovation policies, IP provides important institutional support and legal guarantee for the fulfillment of the strategy.*" Druing China's Economic Annual Meeting in 2014, Shen (2014), Director of the State Intellectual Property Office (SIPO), remarked that the importance of IP is attributable to factors from two aspects. On one hand, IP is related to innovation-driven development; on the other hand, IP is an important factor to support the New Normal of economic development. President Xi Jinping purposed the New Normal in 2014, referring to a necessary stage for China's economic development to reach a higher level. The economic New Normal possesses several notable features. The first is the shift from high-speed growth to medium-speed growth. The second is the continuous optimization and upgrading of the economic structure. The third is the transformation of economic growth engine from input and investment to innovation (Jin, 2015).

Under the New Normal of economic development, it is an inevitable choice to implement the innovation-driven development strategy, accelerate the transformation of economic development model, and push China to a strong economy. It also means that China's IP will enter into a new phase with great opportunity of innovation-driven development strategy. Various issues related to IP development, including the construction of IP system and the implementation of IP strategy, also need to advance with the times, keep in line with the New Normal and the innovation-driven development strategy. Being the foundation of IP development, system construction, especially the construction and optimization of IP transaction mechanisms, is also in need of enhancement and evolution. There was a famous saying by the former U.S. president Abraham Lincoln engraved on the door stone of The United States Patent and Trademark Office (USPTO): "The patent system added the fuel of interest to the fire of genius". IP transactions can bring commercial benefits to IP holders, thus add the fuel to the fire of inventors and designers.

1.1.2 China's IP System Is Gradually Improving

For developing countries, the formation of an IP system is usually rather difficult. Since the establishment of the People's Republic of China (PRC) in 1949, the IP system mainly focused on its management functions. As a result, protection of IP was mainly dependent on a number of administrative rules and regulations. After the establishment of the socialist market economy system since the late 1970s, China has gradually established and improved its IP legal system, and taken steps to comply with international IP standards (the State Council, 1994). From the early 1980s to the early 1990s, China established the initial legal infrastructure of IP, including the *Trademark Law* in 1982, *Patent Law* in 1984, and *Copyright Law* in 1990. Later on, those major IP laws were amended several times. The *Trademark Law* was amended three times in 1993, 2001 and 2013 respectively; the *Copyright Law* was amended twice in 2001 and 2010 respectively, and is undergoing the third amendment currently (Wu, 2012); the *Patent Law* was revised three times in 1992, 2000 and 2009 respectively, and is under the fourth amendment now (Zhan, 2015). The continuous amendment to the major IP laws reflects that China's IP protection system is being gradually improved, the consciousness of IP is being awakened, and the tort costs are continuously increasing.

In the 2013 amended *Trademark Law*, provisions on the principles of good faith, prohibition of cybersquatting, punitive damages, and the infringer's burden of proof are added, indicate that China is constantly strengthening trademark protection. The fourth amendment to the *Patent Law* was launched in 2011, intending to resolve problems on patent infringement disputes such as the difficulty of proof, long-term trial, high cost, low compensation, and poor effect. One chapter about "the implementation and utilization of patents" is added to promote patent commercialization. The third amendment to the *Copyright Law* launched in 2011 also intends to strictly protect contents. The main features are encouraging creation, promoting the utilization of copyright, adjusting the authorization mechanism and market transaction rules, strengthening protection, improving the relief measures, and improving the structure of the *Copyright Law*. To sum up, after several times of amendment, the IP legal system has been improved, and IP protection is gradually being strengthened.

"*Due to historical reasons, administrative law enforcement has been playing a more important role in China's IP protection system. Back to the early period after China's IP system was established, the agreement reached in IP negotiation between China and the U.S.*

in 1995 and 1996 explicitly recognized and increased the role of administrative law enforcement in IP protection, because it can use convenient and effective means to rapidly stop law infringement behaviors and prevent them from further expansion." (Zheng, 1997:51) Besides, the administrative law enforcement system of IP has turned out to be a priority of government policy. As a result, strengthening the IP law enforcement has become the most important and difficult task in the negotiations among countries on intangible protection (Xiao, 2012). According to the World Trade Organization (1994: 341), Article 49 of *Trade-Related Aspects of Intellectual Property Rights* (TRIPs), administrative procedures underline that "*to the extent that any civil remedy can be ordered as a result of administrative procedures on the merits of a case, such procedures shall conform to principles equivalent in substance to those set forth in this section.*" The following are the great changes that China has made about IP administrative law enforcement.

First, Articles 51, 52, 53, 60, 61 and 62 of the *Trademark Law* that came into effect in 2013 have provided the administrative enforcement power and enforcement measures of the administrative authorities for industry and commerce. These measures include inquiry, investigation, inspection, reproduction, on-site inspection, seal up, and distrait, which have greatly enlarged the power of the administrative authorities for industry and commerce and increased the amount of compensation, reflecting strengthened trademark protection.

Second, in terms of patents, SIPO issued the *Measures for Patent Administrative Law Enforcement* in 2010, which was amended in 2015. The main amendment lies in improving enforcement procedures, standardizing law enforcement, making full use of administrative law enforcement measures, and adapting to the development of the Internet.

Third, with regard to copyright, the National Copyright Administration implemented the *Measures for the Implementation of Copyright Administrative Punishment* in 2009 and started the amendment thereof in 2015. The amendment is mainly made on administrative punishment procedures, the administrative liability of Internet service providers, and the copyright law enforcement under the network environment, to strengthen the fight against infringement and piracy.

In the judicial aspect, IP protection is also being improved. Since 2009, the Supreme People's Court of China issues *Intellectual Property Protection by Chinese Courts* every year, introduce the IP judicial protection status in the past year. The number of IP trials has increased rapidly in recent years. The increasing complexity and wide range of cases bring

more difficulties to justices. The range of IP includes not only the traditional trademarks, copyrights, and patents, but also new varieties of plants, layout-design of integrated circuits, and unfair competition. In order to improve the professionalism and unify the standards in IP trials, three IP courts were consecutively established respectively in Beijing, Shanghai, and Guangzhou at the end of 2014. The establishment of IP courts symbolizes that China is entering into a new stage of development on the judicial protection of IP.

On the policy front, the State Council issued the *National Intellectual Property Strategy Compendium* in June 2008. In the section of promoting the creation and utilization of IP, the document provides that enterprises shall be hastened to transform their independent innovative achievements into intellectual property, making them commercialized and industrialized, and be guided to realize the market value of their intellectual properties in manners of licensing and collateral of intellectual property.

In 2014, five years after the implementation of the *National Intellectual Property Strategy Compendium*, the State Council put forward the *Promotion Plan for the Implementation of the National Intellectual Property Strategy Compendium from 2014 to 2020*. The main actions include: the government shall promote the utilization of IP, support the industrial restructuring and upgrading; improve IP protection, and create a good market environment; strengthen IP management, and improve management efficiency; expand international cooperation on IP, and enhance international competitiveness. With regard to "promoting the creation and utilization of IP and supporting industry transformation and upgrading", it puts forward that "efforts should be made to improve the patent coordination utilization system dominated by enterprises and participated by multiple parties, in order to form a patent transaction market system characterized by concentration of resources and dynamic flow, so as to promote the healthy development of the patent operation."

In December 2015, the State Council issued the *Opinions on Accelerating the Construction of an IP Power under the New Situation*, which points out that the country shall strengthen intellectual property protection, promote the development of new technologies, industries, and landscapes, upgrade the industry to international level, encourage start-ups and innovation. Owing to the great support on the IP policy, rapid development has been achieved in various aspects of IP in recent years, including creation, protection, utilization, and management.

1.1.3 The Surge in the Volume of IP Applications

The volume of IP applications is a basic indicator of IP. Over the past decade, the volume of patents, trademarks, and copyrights has undergone rapid development. On one hand, the growth reflects increased IP awareness. On the other hand, it also lays the foundation for IP transactions.

1.1.3.1 The Volume of Patents

The volume of patents mainly includes the volume of IP applications. Meanwhile, granted patents and valid patents are also very important. Granted patents refer to patents granted this year, and valid patents refer to the total granted patents in every year, reflecting the IP awareness of various social members and their innovative abilities. Certain volumes of patents are the premise and basis for patent transactions. Only a large number of patents can support the development of the patent transaction market. With the implementation of innovation-driven development strategy and the *National Intellectual Property Strategy Compendium*, the volume of patents in China has been undergoing rapidly growth in recent years. In 2011, China surpassed the U.S. for the first time to become the country with most patent applications all over the world. By 2015, China had been the country with most patent applications for six consecutive years. According to the statistics from SIPO website, the volume of patent applications and granted patents in China had a rapid growth since 2006, as shown in Figure 1-1. From 2006 to 2015, the number of patent applications and granted patents increased from 573,000 to 2.80 million and 268,000 to 1.72 million respectively, and their annual compound growth rates are 17.2% and 20.4% respectively. Meanwhile, the number of valid patents reached 4,643,000 at the end of 2014. On 25 November 2016, China's performance of one million applications was featured in the first page of the *Financial Times*: "China sets world record for patents". The rapid growth in the volume of patents and the huge number of valid patents has laid the foundation for patent transactions.

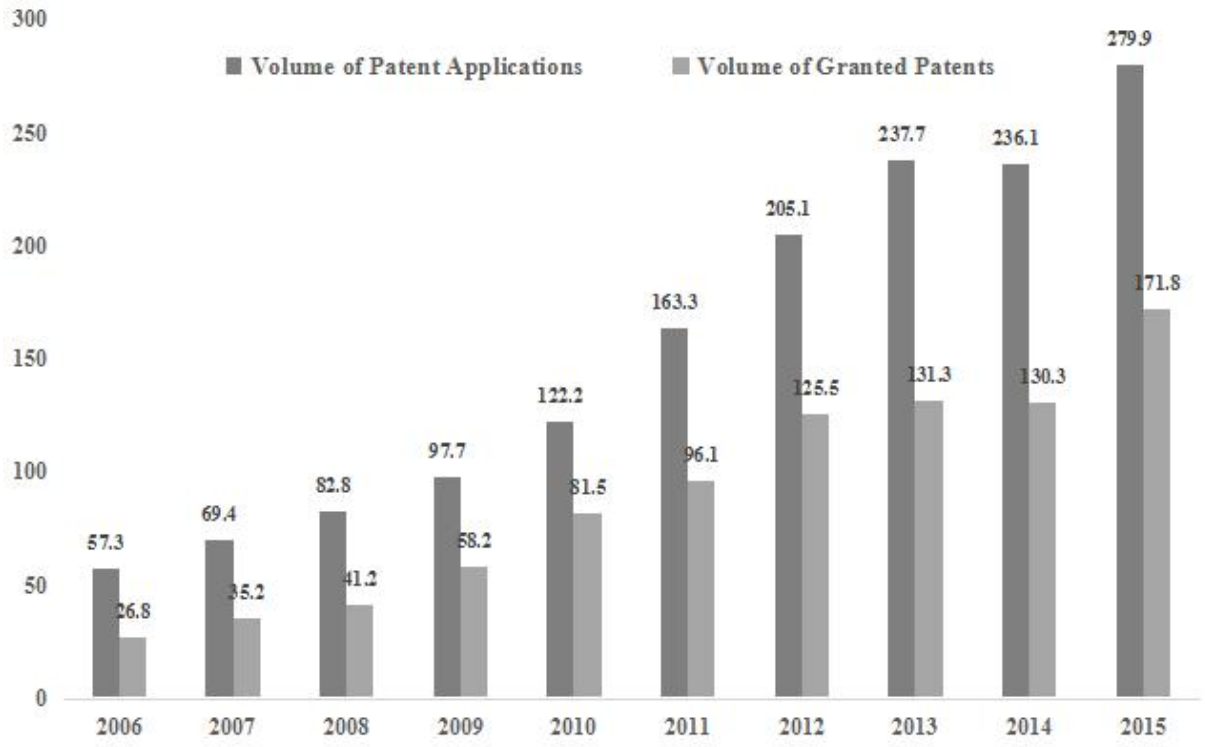


Figure 1-1: The Volume of Patent Applications and Granted Patents in China from 2006 to 2015 (Unit: 10,000)

Source: data from SIPO website http://www.sipo.gov.cn/tjxx

1.1.3.2 The Volume of Trademarks

"*Trademark data can serve the purpose of acting as a partial output indicator of innovations introduced into the goods and services markets and can therefore be used as an empirical yardstick for measuring overall changes in the patterns of economic activity*" (Mendonça et al., 2004: 1401). Thus, the volume of trademarks also reflects the awareness of brand protection. It consists of the volume of trademark applications and registered trademarks. Registered trademarks refer to the trademarks registered this year, and valid trademarks refer to the total volume of trademarks registered in every year. According to statistics from the Trademark Office of the State Administration for Industry and Commerce website, the volume of China's trademark applications and registered trademarks had a rapid growth in the past ten years, as shown in Figure 1-2. The volume of trademark applications and registered trademarks jumped from 766,000 to around 2.66 million and from 276,000 to 2.08 million respectively, and their annual compound growth rates are 13.2% and 22.4% respectively. China has ranked the first in the world for 14 consecutive years in the number of

trademark applications (The State Administration for Industry and Commerce, 2016). Meanwhile, according to the latest statistics released by the State Administration for Industry and Commerce, by October 7th, 2015, the number of valid trademark registrations had amounted to 10.04 million, exceeding ten million for the first time. The large number of valid trademark registrations and the scarcity of trademarks provide a well foundation for trademark transactions.

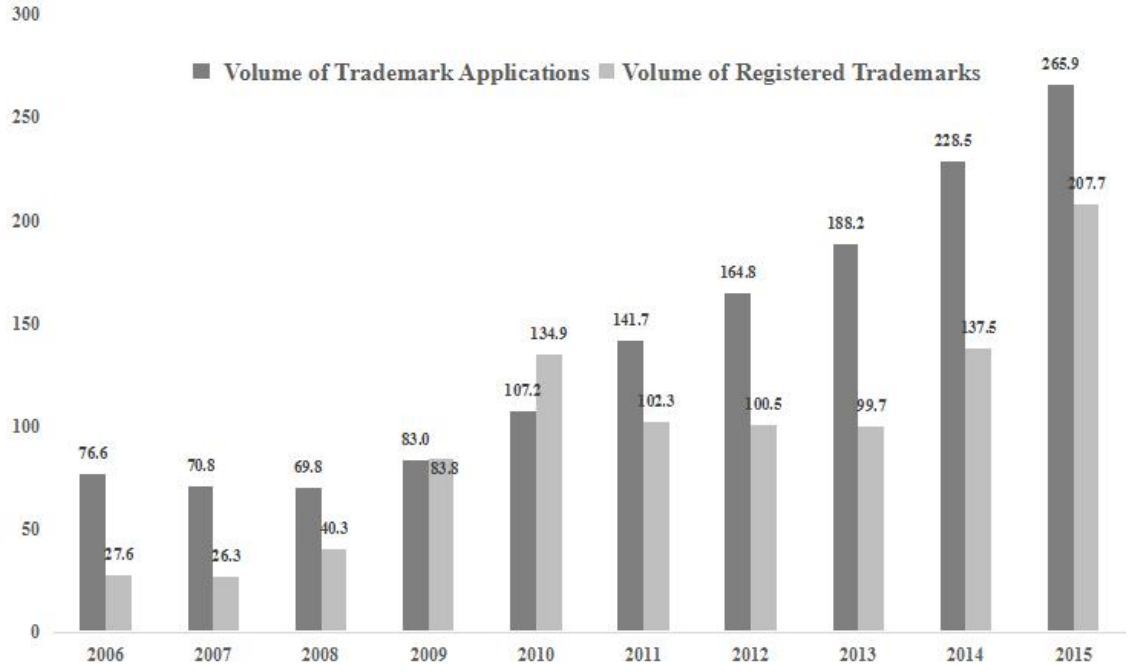


Figure 1-2: The Volume of Trademark Applications and Registered Trademarks from 2006 to 2015 (Unit: 10,000)

Source: Trademark Office of the State Administration for Industry and Commerce, http://sbj.saic.gov.cn/tjxx/

1.1.3.3 The Volume of Copyrights

The volume of copyrights mainly refers to the volume of voluntarily registered copyrights. The purpose of voluntary registration of works is to safeguard the legitimate interests of the copyright authors, holders and users, and to help resolve the disputes due to copyright ownership. Voluntary registration by the author not only reflects the rise of public awareness on copyright protection, but also avoids certain ownership disputes, thus laying a legal foundation for copyright transactions. According to statistics from the National Copyright Administration, from 2006 to 2015, the volume of voluntary registrations increased from 150,000 to almost 1.35 million, and the annual compound growth rate of which reached 24.6%, as shown in Figure 1-3. The rapid growth also provides the foundation for copyright

transactions.

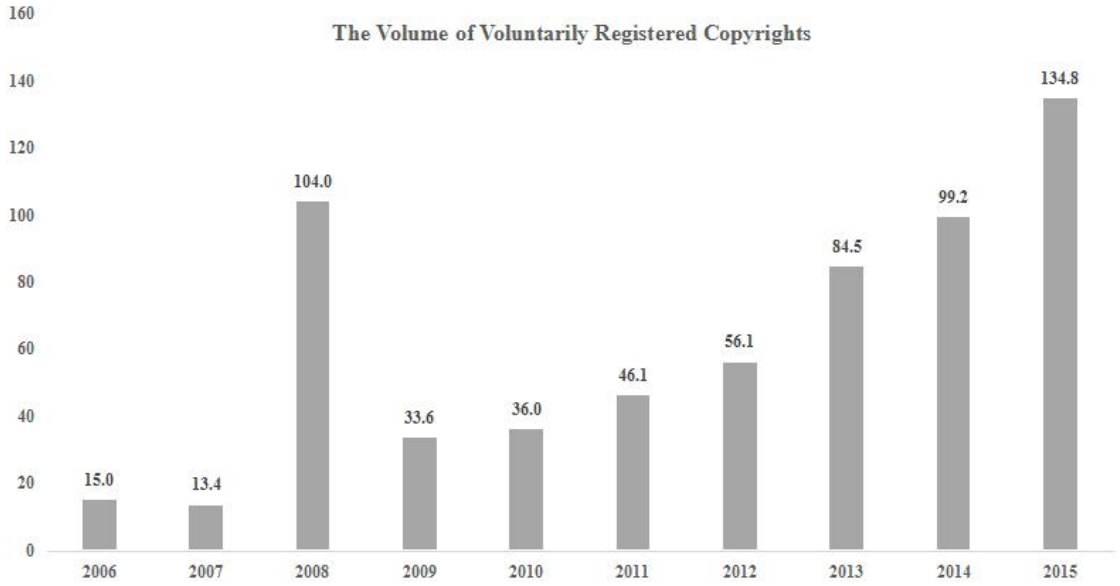


Figure 1-3: The Volume of Voluntarily Registered Copyrights from 2006 to 2015 (Unit: 10,000)

Source: data from the National Copyright Administration, http://sbj.saic.gov.cn/tjxx

1.1.4 The Current Situation of IP Transactions in China

In 2006, SIPO began to implement the *Plan of National Patented Technology Exhibition and Transaction Platform* in order to live up to the visions of IP work purposed in the 16th National Congress of the CPC and the Fifth Plenary Session of the 16th CPC Central Committee and better complement the formulation and implementation of national IP strategies. The core content of the plan is to build up a permanent exhibition and transaction platform for products generated by patents. In 2006, SIPO first established 18 exhibitions and transaction platforms for patented technologies, mainly in such cities as Beijing, Shanghai, Tianjin, and Wuhan.

At the time when SIPO took the lead to establish national exhibition and transaction centers for patented technologies all over the country, the National Development and Reform Commission jointed six ministries and commissions issued the *Guiding Opinions on Establishing and Improving the Intellectual Property Market* in 2007. The document is aimed at implementing the *Outline for National Science and Technology Development in the Medium and Long Term: 2006 to 2020* and the *Opinions of the State Council on Encouraging,*

Supporting, and Guiding the Private and Other Non-Public Economy and their supporting policies, to accelerate the standardized development of the IP market. The overall purpose is to build up an all-dimensional, dynamic, and multi-level IP market. The document also pointed out the opinions should be pushed forward from five aspects: regulating the trading entities and improving the quality of transactions, enriching varieties of transactions and innovating transaction methods, establishing the transaction market and improving the market functions, making overall arrangements and rational distribution, as well as integrating resources and providing supporting services.

However, the Trademark Office and Trademark Review and Adjudication Board of the State Administration for Industry and Commerce (2015) showed that there were only 138,200 trademark assignments and 32,325 trademark licensing contract records in 2014. Based on the total number of 10.04 million registered valid trademarks in 2014, the trademark assignment rate in 2014 was about 1.38%, and the trademark licensing gross rate was about 0.32%. "I Think Tank" (2013), a consulting and training center of the IP Publishing House under SIPO, indicates that the volume of assigned patents was 88,640, and the volume of licensed patents was 19,307. Based on a total number of 4.195 million valid patents at the end of 2013, the patent assignment rate in 2013 was 2.11%, and the patent licensing rate was 0.46%. It can be seen that the low assignment rate and licensing rate in the context of a large number of trademarks, patents, and copyrights means there is huge room for IP transactions. With the focus of IP gradually being shifted to the utilization of IP, IP assignment rate and licensing rate will increase rapidly, and the volume of commercialized IP will increase rapidly.

1.2 Research Objects

The objects of the research are IP transactions and IP transaction mechanisms. The following content provides a discussion of the research objects to define the scope of research.

1.2.1 IP Transaction

IP is the legitimate rights based on intellectual activities or the reputation of business. Compared with physical assets, IP is a form of intangible assets that possess property value despite its lack of physical form. IP cannot only be used to invest as property but is also tradable. IP transactions involve the elements of two aspects, IP and capital or other assets. IP transactions refer to the transactions of IP between equal subjects through market behavior,

including traditional transaction models such as assignment and licensing, as well as innovative transaction models such as collateral, trust, and securitization. Unless indicated otherwise, IP transactions in this Thesis only refer to IP assignment and licensing, excluding IP trust, IP securitization, and IP collateral.

IP transactions refer to the activities carried out by IP holders through the transfer of part or all of IP rights to realize its value. IP transactions play a key role in promoting the utilization of IP, realizing IP value and optimizing allocation of resources. In recent years, China's IP creation ability has greatly improved and the volume of IP has displayed a leaping growth. However, most IP remains inactive for a long time, so the commercialization of IP will undoubtedly become the focus of IP.

1.2.2 IP Transaction Mechanisms

Some scholars have done research on the mechanisms such as Machamer et al. (2000:2-3), and they give one typical definition, "*mechanisms are sought to explain how a phenomenon comes about or how some significant processes works. Specifically: mechanisms are entities and activities organized such that they are productive of regular changes from start or set-up to finish or termination conditions*".

According to the definition of mechanisms, the IP transaction mechanisms refers to the interactions and functions between every component and external factors in the process of IP transaction. Thus, it refers to the relationship between every component of IP marketplace, external policies and regulations, the mechanism and process of action. Mechanism research is a complicated systemic project, as the research focuses on not simple composition of all components, but the synergy and integration on different levels and from different perspectives and how it works.

The components of IP transactions include transaction subjects, transaction objects, transaction methods, transaction costs, transaction security, etc. IP transaction mechanisms refer to the relationship and interactive processes of these components.

(1) Transaction subjects. The main participants include corporate legal persons, individuals, universities, research institutes, and agencies and so on. IP transactions are the profitable transfer of IP among different economic subjects, so enterprises are the main transaction subjects, universities and research institutes play a key role as the research and technology center. Meanwhile, most of the IP transactions are accomplished depending on the

assistance of intermediary, so they also play an indispensable role.

(2) Transaction objects. IP transaction objects include all types of IP, which mainly include trademarks, patents, copyrights, new varieties of plants and animals, domain names, etc.

(3) Transaction methods. As a form of property right, main transaction methods of IP are similar to property rights, such as transaction through agreements, auctions, bidding and tendering, etc. The Thesis mainly researches traditional IP transaction models, including IP assignment and licensing.

(4) Transaction costs. The notion of transaction costs (Coase 1937, 1960; Demsetz, 1968) is the core of IP transactions. IP transaction process mainly produces information cost and contract cost. IP transactions through e-commerce and intermediary can effectively reduce the two types of transaction costs.

1.3 Research Questions

There exists dilemma of IP trading in the operation of IP transaction mechanisms constituted by transaction subjects, transaction objects, transaction means, and transaction costs. In the transaction process, the demander needs full information disclosure to solve the heterogeneity of the technological value of IP, whereas for the supplier, excessive information disclosure might jeopardize the technological safety. The problems of IP information disclosure are likely to increase transactions costs and decrease exchange value of intangible assets. For the “one-to-one” type of IP trade, transaction subjects can negotiate with each other repeatedly to arrive at the effective information disclosure nodes, thus realizing the maximum exchange value while diluting the transaction cost.

Now, the “Research Questions” of this Thesis arise from the context of sporadic subjects and massive IP availability. What are the suitable mechanisms of IP transaction to reduce transaction costs and maximize exchange value? And, how to optimize the mechanisms to solve the dilemma of IP transaction? Based on the research questions, this Thesis analyzes the situation in China, studies the formation, structure, and operating results of the existing IP transaction mechanisms centering on the “dilemma of IP transaction”, and puts forward the optimal plan for IP transaction mechanisms. The following four aspects are included:

(1) Formation and evolution of IP transaction mechanisms. Chapter 2 first analyzes the

formation of IP transactions from the historical perspective, then concludes IP transaction models, the development trend of IP transactions. Finally, discusses the tradability, means, and value assessment of IP transactions from the theoretical perspective.

(2) Structure of IP transactions. Chapter 3 provides the constituting elements of IP transactions, namely, transaction subjects, transaction objects, transaction means, and transaction process, then establishes the conceptual model of IP transaction mechanisms.

(3) Empirical analysis of the operating results of IP transactions. With the data of 1,009 trademark transaction contracts collected between 2013 and 2014 on China Trademark Supermarket Website, Chapter 4 adopts Eviews tools to analyze the influencing factors and influencing degree of trademark transaction prices. Chapter 5 selects the cases of six patent transaction platforms in China and the U.S. and studies the characteristics of the patent transaction mechanisms through comparison.

(4) Optimization plan of IP transaction mechanisms. Chapter 6 proposes the O3 (online-offline-online) IP transaction mechanisms. It not only compares the advantages, disadvantages, and profit-making models between the O3 IP transaction mechanisms and traditional e-commerce transactions, but also designs the operating structure of the O3 IP transaction mechanisms. Besides, this chapter also discusses the policy demands for the O3 IP transaction mechanisms.

1.4 Research Methodology and Framework

Research methodology is the basis of the research, so it is necessary to list the main methodology research methods. The framework, as the outline and overview of the Thesis, can help us understand the Thesis.

1.4.1 Research Methodology

The main methods applied in this Thesis are as follows.

(1) Theoretical deduction. Based on the review of IP transactions in civil law, economics, and management, this Thesis will discuss the essential attribute of IP transactions with the basic theory of civil law. Meanwhile, this Thesis will analyze the transaction data and the current situation of IP platforms at home and abroad with the theory of management science and economics.

(2) Empirical research. By sorting out the data of trademark transactions from China Trademark Supermarket Website, this Thesis will find out the factors that affect the price of trademarks.

(3) Comparative analysis. It is necessary to summarize the advantages and disadvantages of each platform, and provide reference for the future development of IP platforms. This Thesis will make comparative analysis on major IP platforms with respect to their mode of operation, main business, features, and prospects.

1.4.2 Research Framework

The research framework of this Thesis is shown in Figure 1-4. The Thesis first proposes the research questions, the dilemmas of IP transactions based on the status quo of China's economy and IP, as well as China's IP system and the surge in the volumes of IP. Then carries out the theoretical research from the history and development of IP transactions, the modes and patterns of IP transactions and the value analysis of IP, then construct the conceptual model of IP transactions. Next, the Thesis focuses on the empirical analysis based on the empirical study of the trademark transaction and case study of patent transaction. The following content proposes some measures to optimize the IP transaction mechanisms, such as O3 IP transaction mechanism and policy appeals. The last part of the Thesis is about the conclusions and prospects of the research.

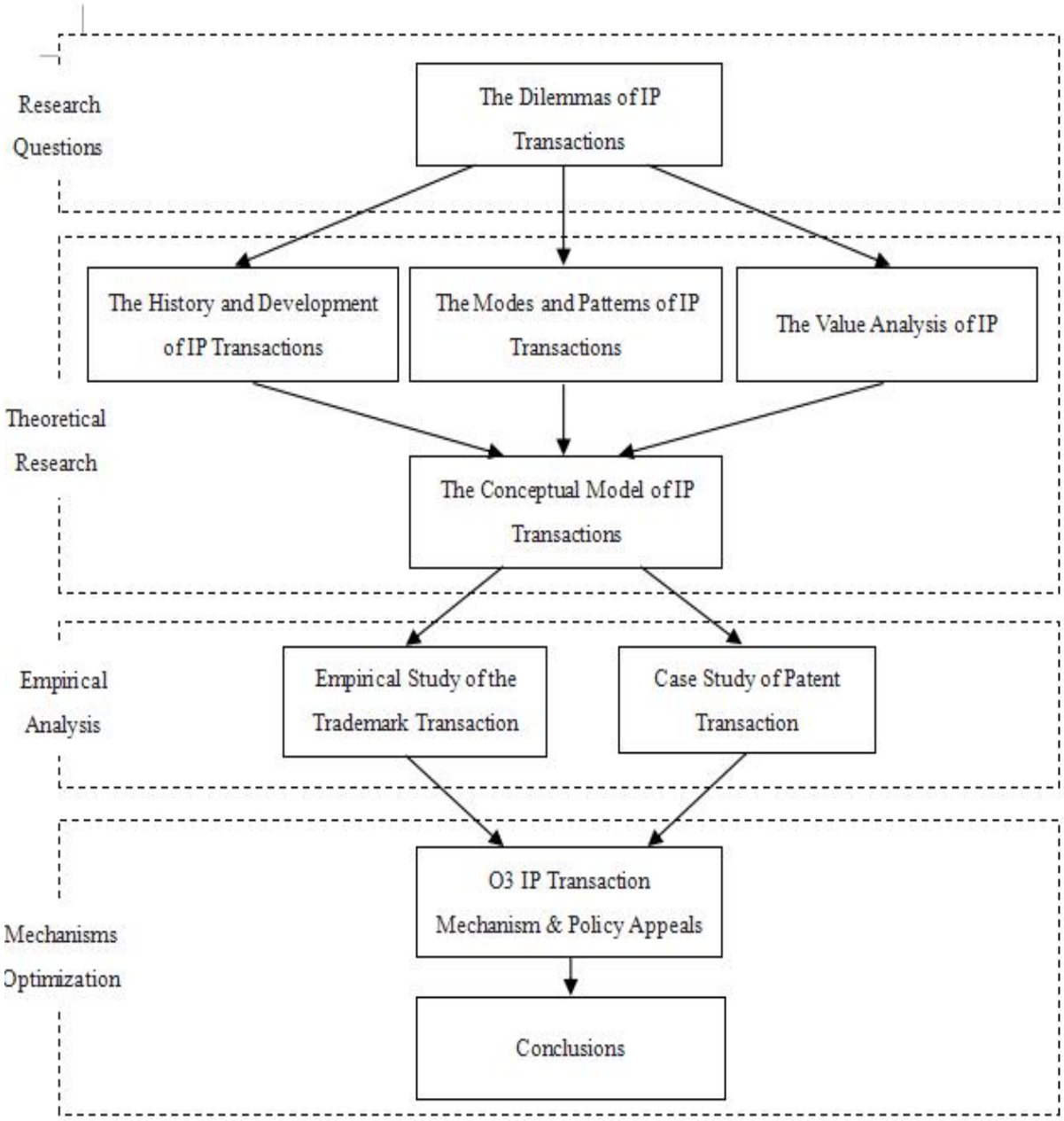


Figure 1-4: Research Framework of China's IP Transaction Mechanism

Source: This Thesis.

1.5 Organization of the Thesis

Chapter 1 of this Thesis analyzes the situation of IP transactions, such as economic situation, the status, and volume of IP, etc., then figures out the key issues of IP transactions. Chapter 2 introduces the history and evolution of IP transactions, the literature review of IP transaction theory, the essence and value of IP, the types of IP, IP transaction models, and IP valuation, and lays a theoretical basis for the research. Chapter 3 focuses on the establishment of the theoretical model of IP transaction mechanisms to analyze the IP transactions. Chapter 4 analyzes the trademark transaction data from China Trademark Supermarket Website, and studies factors that affect trademark transaction price. Chapter 5 analyzes the characteristics and prospects of domestic and foreign patent transaction platforms, and then provides reference for the development of patent transaction platforms. Chapter 6 proposes the O3 IP transactions mechanisms and policy suggestions on IP transactions based on the previous studies. Chapter 7 provides the conclusions and prospects, and summarizes the research.

Chapter 2: Conceptual Framework: Analyzing IPs and the Markets for Ideas

Based on Chapter 1, the Thesis has introduced the economic situation, IP status, current IP transactions, and the importance of IP transactions. The focus of the Thesis is IP transactions. Therefore, this chapter researches the origin and trend of IP transactions to gain a general understanding of IP transactions, and then provides literature review about IP transactions to gain an in-depth understanding. All these lay the foundation for research on IP transaction mechanisms.

2.1 Research Background: IP in China in Recent Times

Based on the origin of IP transactions, we can pinpoint the essential features; and based on the evolution of IP transactions, we can infer the future development. Therefore, review IP in China in recent times is necessary. All these lay a practical foundation for research on IP transaction mechanisms.

2.1.1 The Origin of IP Transactions

In the 1990s, the concept of knowledge-based economy was put forward, which emphasizes the important role of knowledge in the development of modern economy. The Organization for Economic Cooperation and Development (OECD) (1996:7) defines the knowledge-based economy as "*directly based on the production, distribution, and use of knowledge and information*". In knowledge-based economy, wealth creation is increasingly based on innovation, which, in turn, can give rise to important IP (Amable et al., 2010). Knowledge has surpassed the role of land and labor to become the leading form of capital in some fields. The core of the knowledge-based economy is the legal confirmation of knowledge, which depends on the IP system. Along with the gradual deepening of the concept of knowledge-based economy, IP protection becomes sounder and sounder. IP transaction becomes an important means to obtain knowledge ownership, and becomes more and more active.

Xiao and Fan (2014:6) point out *"The Statute of Monopolies in 1623, UK*, *The Statute of Anne in 1710, UK*, and *The Trademark Law in 1857, France, are recognized as the model of modern IP law's emergence*". Nowadays, most of the major countries have established IP

systems. With the rise in global technology trade, the technology trade grows fast and the growth rate is significant. According to statistics, the technology trade accounted for 0.67% in the total volume of world trade in the 1970s. This percentage had grown to nearly 5% in the early 21st Century. The world's technology trade growth rate is 3.3% higher than that of ordinary merchandise trade, with the annual growth rate reaching 15%" (Zheng, 2014: 88). Besides, Zhao (2007: 13) also refers that the world's patent licensing trade has exceeded hundreds of billions of U.S. Dollars according to the statistics from the United Nations. If the trademark licensing, trademark assignment and copyright licensing are included, the total amount of international IP transaction is very huge.

IP transactions usually include patent transactions, trademark transactions, copyright transactions, etc. Among them, trademark transactions are particularly active in China. China's IP transactions date back to the late 1990s (Wu, 2013). For a long period, the IP transactions were not mature in China due to the weak awareness of IP transactions and the immaturity of the supporting facilities related to IP. Many technological property rights transaction institutions had been set up after the establishment of Shanghai Technology Property Exchange in 1999, providing places for IP transactions. The release of the *Guidance on Establishing and Improving the Intellectual Property Market* in December 2007 and the *National Intellectual Property Strategy Compendium* in 2008 have greatly promoted the development of IP transactions in China. In particular, the State Council (2008: 6) points out in the *National Intellectual Property Strategy Compendium* in 2008 "*Enterprises shall be promoted to be the subject for creation and utilization of intellectual property. Enterprises shall be hastened to transform their independent innovative achievements into intellectual properties, making them commercialized and industrialized, and be guided to realize the market value of their intellectual property in manners of assignment, licensing, and mortgage of intellectual properties.*"

2.1.2 IP Transaction Models

During the early period of IP transaction's evolution, it mainly relied on the traditional model, including IP licensing and assignment, the specific transaction models included IP negotiation, IP auction, IP tendering and bidding. Later on, along with the development of finance, Yang (2008) and Wang (2010) propose the concept of capitalization of IP, the capitalization mode consists of IP collateral, IP trust and IP securitization. These capitalization

modes are also IP transaction, but they are quite different from IP licensing and assignment. So they are innovative IP transaction models in this Thesis.

2.1.2.1 Traditional IP Transaction Models

The traditional IP transaction models consist of IP licensing and IP assignment, which are the main ways to achieve the economic value of IP. IP licensing and IP assignment can also promote the economic and social development. In many situations, different mechanisms may be used for the same types of transactions. Successful management of purchasing depends not only on selecting the right product or service but also on choosing the best method to buy them (Handfield and Straight, 2003). Like the purchase of product or service, there are different traditional IP transaction models. So, it is necessary to research the different methods for improving the IP transaction performance. According to the existing transaction practice, the traditional transaction model of IP can be divided into IP negotiation, IP auction, as well as IP bidding and tendering. In practice, IP transactions are mainly completed by negotiation and auction.

Negotiations allow for the price as well as other issues agreed upon by two or more parties. IP negotiation transaction refers to transaction among the buyer, the seller and the IP intermediary, who negotiate to make a contract on the price, date, object, and compliance. It is the mainstream form of IP transactions. Currently, most trademark transactions are completed through negotiation. For example, all transactions on China Trademark Supermarket Website are completed through the negotiation between the owner and the assignee with the matchmaking effort of an agent. The negotiation transaction is applied when the subject of IP transaction is relatively simple, and the object of the transaction is complex. Due to the opacity of transaction process and the inadequate information disclosure, both parties have limited room of choice, so the transaction price cannot reflect fair market value. Meanwhile, even if both parties share their information thoroughly, the information asymmetry remains, thus slowing down the transaction process and increasing the cost of transaction. Finally, as the seller cannot find enough interested buyers, there will be no competition in price, which will easily lead to low transaction price. So IP auction is applied as a supplement to make up for this disadvantage of negotiation transaction by enhancing the transparency of transaction.

However, due to the specificity of IP transactions, both the user and the supplier are relatively determined in practice. Therefore, the IP transactions are usually completed through negotiation transaction with the introduction of IP transaction intermediary, to minimize the

negative effects such as information asymmetry. As a result, the negotiation transaction is usually applied in practice.

Auctions are a form of trading through public bidding to transfer specific goods or property rights to the one who pays more money. In auctions, the type of information that the mechanism accepts from and returns to bidders is structured and known to them. It is also made available to all bidders at the same time (McAfee and McMillan, 1987). Auction mechanisms require that the rules are explicit, complete and fixed for the duration of the process (Kersten et al., 2008). The auction process is highly transparent and open, which can realize the value of IP to the maximum extent. "*Intellectual property is usually difficult to assess and sell like tangible assets and goods. However, the auction makes it easy to sell, and it is quite an ideal choice"* (Ren, 2008: 63). However, the IP to be auctioned may be inadequately presented, the bidders may maliciously collude with each other, and the winner may not be able to utilize the IP after winning the auction, all of which restrict the development of IP auction.

In practice, although IP auction is highly transparent, it is usually for simple objects, of which the price is the main condition that is concerned. At present, several IP transactions have been completed through auction. Public auctions of specific patents have taken place in the U.S. in connection with bankruptcy proceedings (Viscounty et al., 2006). As the popularity of auction is different among trademark, patent, and copyright, the copyright auction is highly recognized. The first auction of movie and TV literature copyright in China was held in December 2014 (Miu, 2014). The auction obtained 961 literary works, plays, film cooperation projects as candidates, and 12 outstanding works were selected as the bids of the auction. In the end, the five plays were all sold, *I Want Us to Be Together, Broken Dream, The Woman Who Refused to Accept Her Fate, King of Sword King,* and *Chasing Waves*. The total revenue reached RMB 182.41 million Yuan (Wang, 2014).

Zhang (2002) points out that the essence of tendering and bidding is to get the best goods, construction projects and services at relatively low price in the procurement. IP tendering and bidding transaction refers to the process where the IP holders issue the announcement of IP assignment and conditions, gather intended bidders of natural persons or legal persons to compete for the bid, before the tenderer sells the IP to the bidder who meets the condition. Owing to the long time from bidding announcement in the early stage to bidding completion in the end, complex procedures, and high transaction costs, the IP tendering and bidding has

not been practiced. Tendering and bidding transactions can apply to technological inventions and patents with high technology. It will enjoy bigger room for development together with commissioned technological development. As a representative exchange method, it needs to be further explored in practice.

2.1.2.2 Innovative IP Transaction Models

With the development of economics and relevant theories, the traditional IP transaction models cannot meet the actual demand. In this context, innovative IP transaction models have emerged, such as IP collateral transaction, IP trust transaction, and IP securitization transaction. The innovative models not only realize the value of IP more flexibly, but also help firms that cannot finance through tangible assets to get through the difficulty caused by the lack of money. What is more, they have also increased the efficiency and promoted the development of the IP transaction marketplace.

Collateral is an important mechanism for decreasing credit rationing and credibly signaling borrower quality (Stiglitz and Weiss, 1981). After using a sample of secured syndicated loans, Loumioti (2012) found that intangible asset collateralization was a credit market innovation that partially alleviated financing frictions.

Japan suffered from the economic bubble in the 1990s, tehn the economy had been floundering, resulting in the dramatic shrink of traditional tangible asset. As a result, a way of financing through the collateral of IP was originated. Japan Development Bank implemented about 300 IP collateral cases from 1995 to 2007, and the total amount reached 18 billion Yen (about RMB 1.26 billion Yuan) (Li, 2000). The IP collateral is intended primarily for SMEs and the emerging industries. Compared to Japan, the IP collateral in the U.S. is market-oriented and supplemented by government policies and supporting measures, and the scale of financing has developed to a considerable extent. The first IP collateral case in the U.S. can be traced back to a hundred years ago, when Thomas Edison, the great inventor, raised fund for his own General Electric through the collateral of electric light bulb patent (Millard, 1990). According to the national conditions, China chose the same type of government-oriented IP collateral as Japan. With the encouragement of the government and introduction of various supporting policies, the scale of IP collateral has been gradually growing these years. SIPO identified the first batch of six IP collateral institutions in 2009, in order to help innovation-driven SMEs to solve financial problems through the IP collateral. Later, SIPO launched the second batch of IP collateral institutions. As a result, the IP

collateral has become more and more attractive. Patents, trademarks, copyrights, and other types of IP have all become the objects of IP collateral. Many SMEs and research-oriented enterprises have obtained loans from IP collateral.

The principle of trust is to manage money for clients. It is an effective asset management system as well as a new way of IP transaction. However, due to the high requirements for the conditions of IP trust, there is still little attention devoted to the exploration of IP trust. As a new trust product, laws and regulations shall regulate IP trust as well. However, there are no relevant provisions in the *Trust Law* on IP trust. There are only few provisions that expressly include IP trust in the *Administration Measures of Trust Investment Corporation* issued by the People's Bank of China in January 2001.

The IP trust has developed quite rapidly abroad. "*In the U.K. and Germany, the trust has been applied to the copyright collective management organization to manage copyright and its royalty*" (Yang, 2008:177). "*In June 2004, Japan revised its Trust Law, adding copyrights and patents into the scope of trust property"* (Yuan, 2010:3-4). In China, the Supreme People's Court made a judgment on the identification of trademark trust before the *Trust Law was* promulgated. In May 2000, the Supreme People's Court made a judgment, affirming that TMT Company and Guangdong Light Industrial Products Import and Export (Group) Company had formed a trademark trust relationship. The trademark belonged to TMT Company, and TMT should compensate RMB 2.5 million Yuan for Guangdong Light Industrial Products Import and Export Company. In October 2000, Wuhan International Trust and Investment Corporation pioneered to start up the patent trust business. However, two years later, the company announced the cessation of the patent trust business. As a result, China's first patent trust business exploration ended up in failure.

"*Intellectual property securitization has taken a variety of forms since its creation in the mid-1990s. These have included music royalty, future film, and trademark licensing receivable transactions. IP-backed securitization consists of the assignment of IP by an owner for securitization and the receipt of capital from investors in the form of lump sum payments*" (Kumar, 2006: 98). Among the famous securitization transactions in the field of IP, the securitizations of the copyrights of the singer David Bowie in 1997 is outstanding (Solomon and Bitton, 2014). Then, IP Securitization, as a new means of financing, attracted widespread attention in developed countries. Later, IP securitization expanded from music to video games, movies, sports, animation, fashion brands, food and beverage, pharmaceutical product patents,

and semiconductor fields, etc., with diversified forms of securitization. As a result, IP securitization has become an innovative means of financing, which is highly valued by the U.S., Japan, and other developed countries. The U.S. investment banks and its IP filed identified IP securitization as a major asset securitization project. Yang (2008) summarized some IP securitization cases in the major countries, as shown in Table 2-1.

Table 2-1: Cases of IP Securitization

Nation	Number	Date	Promoter	Asset	Financing Amount
U.S.	1	1997	Universal	Royalty receipts of music	1.1 billion dollars
	2	2002	Dream Works	Royalty receipts of movies	1 billion dollars
	3	2003	Village Roadshow	Royalty receipts of movies	1 billion dollars
	4	2005	Michael Jackson	Royalty receipts of music	2.7 billion dollars
	5	2000	Yale University	Pharmaceutical patent licensing	1 billion dollars
	6	2003	Royalty Pharma	Pharmaceutical patent licensing	2.25 billion dollars
Japan	1	2003	Scalar Inc.	Optical patent licensing	0.2 billion yen
	2	2003	Japan Digital Contents Inc.	Adaptation right of *Kaiketsuzorori* (Children's comics)	1 billion yen
UK	1	1997	David Bowie	Royalty receipts of music	55 million dollars
	2	2001	Leeds United Of FA Premier League	Ticket sale of football matches	71 million dollars
Italy	1	1999	Cecchi Gori	Royalty receipts of films	280 million dollars
	2	2002	Parma of Serie A	Sponsor income, trademark revenue, advertising revue, and revenues from telecast	95 million euros
Spain	1	1998	Real Madrid	Sponsorship from Adidas	50 million dollars

Sources: The IP securitization cases are from Yang (2008).

In China, the IP securitization is still under the theoretical research. Theoretical studies (Ai et al. 2004; Cai, 2011) suggest that China has met the basic requirements to implement IP securitization, in terms of government policies, the number of IPs, and the practice of asset

securitization. The share exchange is a new attempt of IP securitization transaction in China, mainly in artwork copyright transactions. Its emergence not only meets the investment needs of investors on IP, but also provides a new way to the exploration of IP transaction. This new pattern of transaction lowers the financial and professional threshold, shortens investment cycle, and increases liquidity, so that more investors can enter the market. The concept of artwork share exchange concept is derived from the concept of asset securitization. Wu (2013) researched the first artwork share exchange *Yellow River Roaring*. The *Yellow River Roaring* was valued at RMB 6 million Yuan in the Tianjin Culture Assets and Equality Exchange in 2009. The Exchange Market divided it into six million shares, and the price of each share was RMB 1 Yuan, representing the corresponding proportion of ownership. Despite this, the per share price of *Yellow River Roaring* increased 1,716% within 30 days. As the price of each share was too volatile, hiding great risks, the share exchange was halted later, and IP securitization attempt was subsequently shut down in China.

2.1.3 The Development Trend of IP Transactions

Nowadays, with the rapidly growth of knowledge-based economy, each enterprise is trying to save the cost of rapid development. Normally, they tend not to develop all technologies by themselves, but hope to obtain corresponding technologies from other enterprises or institution in a certain way, such as IP assignment and IP licensing. Therefore, it is necessary to consider how to carry out IP transactions to obtain the required IP. As mentioned before, IP transactions include the traditional models and innovative models. The traditional transaction models seem relatively simple and easy to implement, whereas the innovative IP transaction models are relatively complex. They both have their scopes of applicability.

The traditional way is relatively suitable for transactions between small enterprises, whereas the innovative IP transaction is suitable for financing of large companies. For different types of IP, we need to analyze its particularity, and then select the most appropriate transaction model to improve the efficiency. Therefore, instead of adopting a single transaction model, the future IP transaction platform will choose various ways of transaction. It is clear that IP transaction models are closely related to IP transaction efficiency, and the development trend is related to the prosperity of the future IP market. Therefore, the exploration of the future trends of the IP transactions is of great significance.

2.1.3.1 Further Development of the Traditional IP Transaction Models

The traditional IP transactions mainly involve the assignment and licensing of IP, which include IP negotiation transaction, IP auction transaction, as well as IP tendering and bidding.

IP negotiation transaction applies to the situation where the transaction subjects are determined but the transaction objects are complex. As the negotiation transaction process is confidential and the two parties only determine the price, this transaction model lacks efficiency and transparency. Besides, due to the particularity of the IP transaction objects and the limitation of the transaction subjects, the negotiation transaction will remain the main means of transaction in the future and play an important role. Information technologies make it possible to support the negotiators' decision-making and communication activities. It can absorb the advantages of e-commerce to improve itself.

In IP auction, as long as the bidders have the corresponding purchasing power, they can participate in the auction, and each bidder has the possibility to obtain the IP as long as they offer the highest price in the auction. Although the IP auction allows the market to determine the price of IP, it is likely to cause the price of IP to deviate far from its value. Furthermore, some types of IP, such as trade secrets, cannot be auctioned. However, there have been successful attempts in patent auction, trademark auction, and copyright auction in China (Fang et al., 2012; Zhuang, 2008; Miu, 2014). Besides, more and more players have accepted this transaction pattern. IP auction will have development in the future.

IP tendering and bidding is an IP transaction pattern where suitable IP is tendered to the open market. But it is time-consuming and involves many legal issues, which hinder the progress of tendering and bidding. At present, the information about IP tendering and bidding is rather scarce, which needs more attention in the future.

2.1.3.2 Innovative IP Transaction Models Enjoy Broad Prospects

The innovative IP transaction models are the combination of IP and finance, have broad market prospects in the future. SIPO (2015) points out that the effective integration of IP and financial resources can help widen the financing channels for medium, small and micro-enterprises, improve the environment of innovation in the market, and promote the virtuous cycle of innovation resources. It may also help to build a multiple capital investment mechanism based on IP value, and spread the technological innovation achievement through value-added professional financial services, to promote the transformation of IP fully. The *Opinions on Further Promoting Intellectual Property Financial Services* shows the broad

prospects of innovative IP transaction model.

IP collateral does not assign the IP. On the contrary, the IP holder uses IP as collateral to apply for loans from banks and other financial institutions. Owing to the high risk of IP, banks and other financial institutions may be unwilling to offer loans in consideration of the stability of its business in the future. In such cases, the implementation of IP collateral requires not only the participation of specific traders, but also the reduction of the risk by guarantee companies. Moreover, the financing process also needs to be regulated by law. However, China has not yet established a complete legal system of IP collateral, which hinders the IP collateral. In 2008, SIPO started to carry out financing through patent collateral. Tian (2013) indicates that in 2012, the total amount of patent collateral reached RMB 14.1 billion Yuan, that of trademark collateral reached RMB 21.46 billion Yuan, and that of copyright collateral amounted to RMB 2.751 billion Yuan. By the end of 2015, the newly added amount of patent collateral had reached RMB 56 billion Yuan (SIPO, 2016).

The regulations on IP trust are very strict (Huang, 2013). First, in accordance with relevant provisions of the *Trust Law,* the trust property must be registered; however, there is no further regulations and specific operation guide on trust registration in the *Trust Law*. Second, the quorum of establishing the copyright collective management organization is no less than 50 people. Third, the IP trust calls for high requirements for trustees. The trustees shall not only be skilled in market and financial operation, but also have the legal basis and professional basis of IP. At present, China only boasts market operation professionals, but lacks IP trust professionals. The trustees must be banks and other financial institutions qualified in carrying out trust. In 2000, Wuhan International Trust Investment Corporation attempted to assign patents into trust, but failed half way. It is obvious that both the strict IP trust regulations and difficulties in operation have limited the development of IP trust. China's IP trust is still in infancy.

IP securitization has taken a variety of forms since its creation in the mid-1990s (Kumar, 2006). With reference to asset securitization, there have been a lot of successful cases regarding IP securitization all over the world, such as the Bowie bonds in the UK, the drug patent case in Yale University in the U.S., and the optics patent case in Scalar in Japan (Yang, 2008). However, the process of IP securitization is very complex and requires long time. First, a qualified IP shall be selected as the underlying asset and the asset must possess the characteristics of basic securitization assets, such as clear ownership. Second, arrangements of

the security issuance of the chosen IP shall be made, and credit rating agencies and credit enhancement agencies shall be invited to improve the credit rating to attract investors. Finally, post-management of the cash flow shall be made and the risk of the underlying assets shall be managed. The whole process requires the participation of many institutions to guarantee the smooth progress of IP securitization. For example, law firms are responsible for resolving the legal issues of the underlying assets, evaluation agencies are obliged to evaluate the intangible assets, and investment banks shall help to issue securities. IP securitization, which is mainly used to help enterprises raise funds, is an effective measure to remove their capital bottleneck.

In recent years, many platforms in China have made attempts in IP securitization, such as share exchange of artwork copyright. The concept of artwork share exchange is derived from asset securitization. The asset securitization is an important part of financial innovation and reflects the development trend of financial innovation. Artwork share exchange is based on the strict physical identification, assessment, custody, and insurance of artwork. By splitting the artwork into equal shares, the artwork can be exchanged in the form of rights. However, the State Council issued the *Decision on Rectification of Various Types of Trading Venues to Effectively Prevent Against Financial Risks* in 2011, ending this new attempt of IP securitization.

2.1.3.3 The Use of E-commerce in IP Transactions Has Bright Prospects

With the popularization and development of the Internet, e-commerce has become the primary choice of many kinds of transaction activities. Compared to the traditional commodity e-commerce model, the electronic business model of IP transactions is worthy of attention. With the development of the modern financial system and the Internet, the application of e-commerce in the IP transactions will be more and more in-depth. At the same time, with the advantage of e-commerce in information transmission, it can greatly save the search cost and communication cost for players in the IP transactions. Furthermore, with the development of financial technologies, new IP transaction models might emerge in the future, such as IP futures and IP options transactions.

In the early stage, IP transactions were carried out through offline and face-to-face communication, often along with the help of IP intermediaries. With the rise and development of Internet and e-commerce, IP transactions and e-commerce started to integrate. In the beginning, IP intermediaries released IP transaction information through websites, which reduced the search cost of IP transactions, giving birth to IP e-commerce transaction platforms,

such as China Trademark Supermarket Website. Currently, the model of the combination of online and offline e-business is being explored. Before IP transactions, the players can get more information about the transaction object, and then complete transactions directly online. They can also complete the preparatory work of IP transaction online, and accomplish final work and related follow-up work offline, such as the O3 IP transaction mechanisms explored by CIPRUN. The O3 IP transaction mechanisms can help reduce transaction cost and greatly increase transaction efficiency. Chapter 6 provides detailed elaboration on the O3 IP transaction mechanisms. In the future, both the traditional and innovative IP transaction models can be optimized with the help of e-commerce.

2.2 Analysis of the Tradability of IP

The analysis of the tradability of IP can help us understand the essential value of IP. The tradability of IP is the basis for research on IP transactions. This section provides an analysis of the tradability of IP from the essential attribute and value of IP.

2.2.1 The Essential Attribute of IP

In recent years, IP has attracted more and more attention all over the world. People research IP for comprehensive understanding from various fields, in order to enhance the competitiveness of enterprises. Liu (1995) believes that IP is a general term for all legitimate rights owned by creators of intellectual achievements or owners of marks in industry and commerce.

Regarding the nature of IP, Wu (2006) introduces his theory from the multidimensional perspective of target value and system functions. He explains his theory in detail from private, national, and international levels of IP, the three levels may be the basic nature of IP. In addition, Su (2005) believes that the understanding of IP is deepening, redefines and explains IP based on existing studies, and expounds his understanding of IP.

Scholars have also analyzed the essential nature of IP from different perspectives, such as concept, main object, public rights, private rights, human rights, non-material nature and intangibility, economic nature, and information nature, etc. On the conceptual level, Wang (2006) summarizes that IP is a civil right, of which natural persons, legal persons, and other organizations are entitled to on the basis of their creative intellectual achievements and marks

used in industry and commerce within a certain time and a certain geographical area. Zheng (1997) expounds the concept of IP in detail, and analyzes the range of IP in various countries of different times and the characteristics of IP. Zhang (2001) believes that there are some misconceptions on IP, defines IP on her own based on criticism of these misconceptions, and points out that IP is the right of a civil body disposing of his intellectual achievements, commercial marks, and other information of commercial value, as well as excluding others to interfere with his right.

As to the object and subject of IP, Wu (2000) redefines the subject and object of IP based on civil law theory. He believes that, in essence, IP is a kind of intangible property rights. Guo (2008) makes comparative analysis on several theories regarding the object of IP, and further reveals that the nature of IP is that it represents non-material information. He (2014) proposes a new understanding of the object of IP. Proceeding from the property nature of intellectual achievements, he identifies the property nature from two dimensions. Understanding the object of IP from this perspective is conducive to the formation of a comprehensive IP system.

Some researchers believe that the essence of IP lies in its information, and analyze the essential attribute of IP from this perspective. Zheng and Zhu (2005) believe that IP is characterized by the nature that intellectual achievements can be shared. Because IP is a specific type of information in essence. Zhang (2006) analyzes the historical development of IP and concludes that the essence of IP is information.

Is IP a public right, private right, or human right? Li and Lv (2004) believe that with the development of the society, IP has gradually become socialized and turned into public law. Particularly with the economic globalization, all countries are implementing their strategies of empowering the nation with IP development. Feng and Liu (2004) believe that in today's IP era, IP has gradually transformed from a private right into social public right. The private right is the principal aspect of the contradiction of IP, while the public right is the secondary aspect. The assignment from private right to public right of IP means that while strengthening the protection of IP, the public interests should also be focused on in order to prevent the insufficient or excessive protection of IP. Zhou and Hu (2005) believe the essence of IP is its intellectual creativity, which belongs to private rights but depends on public rights. Meanwhile, even though IP has the attribute of property right, its main aspects also contain important attributes of human rights. Wu (2003) expounds the private right and human right nature of IP based on the *TRIPs* and *World Convention on Human Rights*. He believes that it

is necessary to make institutional arrangements on IP within a country, and build an international IP protection system within the scope of private rights and property rights. Moreover, a legal system characterized by the integration of private rights and human rights cannot only protect the interests of IP creators, but also safeguard social public interests. Zou (2010) believes that the private property nature of IP cannot well adapt to the needs of social development, and the public nature is significantly reflected in all aspects of society. Peng and Wu (2005) hold that under the trend of developing public right of IP, more attention shall be paid to the private nature to optimize the IP legal system.

The essential attribute of IP is that its objects are non-material and intangible. Based on this view, Cui and Peng (2002) believe that commercial secrets are also a kind of intangible product, it is unreasonable to exclude commercial secrets from IP due to the exclusiveness, territoriality, and validity of IP. Wang (1996) argues that IP is an intangible and non-material asset created by people, and expounds the differences between the intangible asset IP and tangible asset. Xiao and Wei (2011) analyze the attribute of IP with relevant theories. They believe that the knowledge and products derived from IP have the essential attribute of intangibility, which further derives exclusiveness, validity, and territoriality.

By comparing the intangible asset IP with tangible asset, Jiang and Zheng (2001) elaborate on the features of IP from four aspects, namely, the intangibility, relative monopoly, limited time and space of the legal effect, and the uncertainty of the scope of the right protection. Ren (2006) believes that the essence of IP lies in its intellectual creativity. Zhu (2002) holds that IP has not only the attribute of private right but also the attribute of property right, and it is in essence an exclusive property right attributed to specific subject. The object IP protects is mainly the property right created by human intelligence. Su (2008) analyzes IP from the aspects of philosophy, economics, and law. From philosophy, he argues that the object of IP is the specific useful information; from economics, he explains the non-property attribute of intellectual as information; from law, he points out that as being regulated by law, IP must be subordinate to social public interests and the state sovereignty. Wang and Zhu (2004) contend that the basic attribute of IP is its economic efficiency. IP and incentives are closely related. The basis and utility for the formation of IP as well as relevant commodity and value connotation all reflect the economic efficiency nature of IP.

2.2.2 The Value of IP

Since IP is a kind of special asset, its value is both similar to and different from the value of tangible asset. The similarity includes two aspects. First, they are both useful, and the products produced with specific IP can be exchanged to realize its value. Second, IP is relatively scarce. Because law protects IP, the profits gained from the products made by IP are monopolistic. The value of IP is realized through the transaction of part or all of rights, rather than the transaction of material goods. In comparison, the value of IP can be realized by the way of collateral, securitization, licensing, assignment, and so on.

Some scholars study the value of IP from economic theories, and some analyze it from the special characteristics of its value. Fan (2006) investigates the value of IP from the theories of labor value, cost of production value, and marginal utility value. She believes that the value of IP can be explained by marginal utility value. Dong and Ma (2001) study the uncertainty of the value of IP according to the uncertainty of the value projection of IP, the uncertainty of the contribution rate, the uncertainty of supply and demand, and the uncertainty of substitution, laying a foundation for the comprehensive understanding of the value of IP. In addition, some researchers analyze the value of IP from the specific type. Hu (2008) analyzes the nature of the patent value, and defines patent value in theory. Zhao (2004) points out that labor is the only source of trademark value, which is reflected in the formation of trademark value, determination of the trademark value, and the ownership of trademark.

2.3 The Types of IP

In IP transaction practices, patent, trademark, and copyright are the three major objects involved. Therefore, the IP transactions mentioned in this Thesis mainly refer to transaction of patents, trademarks, and copyrights. The objects of IP transactions also only refer to patents, trademarks, and copyrights. Different types of IP have different characteristics, and the most suitable transaction patterns of IP vary as well. Xiao (2009) summarizes the characteristics of different types of IP, as shown in Table 2-2. Since the objects of protection, validity period, registration requirements, necessity to accept examination, cost of obtaining the right, maintenance cost, and cost of safeguarding rights of different types of IP differ, the transaction subjects, suitable transaction ways, and transaction cost also vary accordingly.

Table 2-2: Characteristics of the different types of IP

	Patent	**Trademark**	**Copyright**
Protection Objects	Product, patented process, design, computer program, and business method.	Recognizable sign or design related to products or services	Original works
Validity Period	20 or 10 years	10 years	50 years after death or 50 years after publication in China
Registration requirements	Yes	Yes	No
Necessity to accept examination	Yes	Yes	No
Cost of obtaining the right	Medium	Low	Low
Maintenance cost	High	Medium	Low
Cost of safeguarding rights	High	Medium	Medium

Sources: based on Xiao (2009).

2.3.1 Patents

Patents refer to the protection of the exclusive rights enjoyed by people to their own inventions within a certain time and region. Unless otherwise permitted by law, no one is allowed to implement patents without the authorization of patent holders, or constitute patent infringement. At present, most countries have established the patent system. The establishment of patent system can help the right holders achieve technological monopoly in a certain period through legal means, to protect their own interests. On the other hand, the right holders also have to disclose their technical information to obtain protection. The disclosure of information is a great way to achieve balance between individual interests and social interests, which is the most important characteristic and the basic function of the patent system. *"Preventing copying is not the only motivation for patenting. Using patents for blocking rivals to advance their technological trajectories, for avoiding lawsuits, and for negotiation leveraging are increasing patenting rationales* (Mendonça, 2005: 284)*"*.

There are three types of patents in China, invention patent, utility model patent, and design patent. Invention patent is a new technical solution relating to products, or a process, or the improvement thereof. The utility model patent refers to new technical solution that is

practical to the product's shape, structure, or combination thereof. The design patent is a new design for industrial applications to the product's appearance, patterns or their combination, and the combination of colors, shapes, and patterns, which should be aesthetic. In China, the invention patent lasts for two decades, and both utility model patent and design patent last for ten years.

2.3.2 Trademarks

"Trademarks are the outcome of establishing recognizable designations and symbols for goods and services, as well as firms' identities. They play a crucial role in the process of marketing innovations, being instrumental in differentiating the attributes of goods and services in the marketplace. These characteristics make trademarks a potential indicator of product innovation and sectoral change." (Mendonça et al., 2004: 1385). As a result, trademarks have functions of expressing sources of goods or services, quality assurance, advertising, and individuality. Trademarks can reduce consumers' cost for searching for goods or services. The value of the trademarks lies in their utilization. They gradually evolve into a property and vital resource for competing between operators, which are of far more value than the goods or services.

In China, trademarks can be divided into product trademark, service trademark, collective trademark, and certification trademark. The elements of trademarks include text, graphics, letters, numbers, three-dimensional marks, color combinations, sound, as well as combinations of these elements. The purpose of protecting a trademark is to prevent confusion and dilution. The core nature of a trademark is whether its mark is easy to identify. Distinctiveness is the core of trademarks, which significantly determines whether the logo can become a trademark and obtain the exclusive right, and the trademark owners can maintain the exclusive right. Distinctiveness can be divided into inherent distinctiveness and acquired distinctiveness. The former refers to a symbol naturally easy to identify because of its creativity. The latter refers to a mark lacking inherent distinctiveness, but after long-term continuous use, it produces new meaning and becomes easy to identify. However, the distinctiveness of trademark is not eternal and may gradually fade or recover. In China, a trademark registration shall remain valid for a period of ten years from the date of approval for registration, and the registration can be renewed for another decade.

2.3.3 Copyrights

Copyrights refer to the personal and property rights of authors and other right holders of literary, artistic and scientific works. In accordance with the *Copyright Law*, personal rights include rights of publication, authorship, alteration, and integrity, whereas property rights include the right of exploiting one's work by means of reproduction, publishing, lease, exhibition, performance, screening, broadcasting, information network dissemination, filming, adaptation, translation, compilation, and other rights enjoyed by the author. Property rights in copyrights can be assigned or licensed to others. In China, the term of protection of the rights of authorship, alteration, and integrity of an author shall be unlimited. And the term of the protection of the right of publication, the right of exploitation, and the right to remuneration in respect of a work of a citizen shall be the lifetime of the author and 50 years after his/her death. The term of a copyright, to which a legal person or entity without legal personality is entitled, shall be 50 years after the first publication of such work.

Copyright works are registered voluntarily. The purpose for China to adopt a voluntary registration system is to safeguard the legitimate interests of the authors, other copyright holders, and users. It also can help to resolve copyright ownership disputes by providing preliminary evidence on ownership. Thus, the volume of voluntary copyright registrations may reflect the activities of the creation of literary, artistic, and scientific works to some extent.

2.4 Transaction Patterns of IP

There are several ways for IP holders to obtain their economic benefits, such as self-use, licensing, assignment, collateral, and investment. Licensing and assignment are the main ways. For a nation or an enterprise, the competition in the future society is the competition of IP. Only those who can obtain IP protection for their research and development (R&D) results can stimulate innovation. Only when IP is transformed into real productivity through licensing, assignment, and other ways can it really give full play to its value and functions in promoting economic and social development.

2.4.1 IP Assignment

In the U.S., form Title 37 Code of Federal Regulations (CFR) 3.1, "*assignment means a*

transfer by a party of all or part of its right, title and interest in a patent, patent application, registered mark or a mark for which an application to register has been filed".

So, IP assignment is an important way of IP utilization, for it cannot only provide compensations to IP holders, but also promote the industrialization of IP. Chinese and foreign scholars have carried out relevant research on IP assignment. Pan (2012) believes that IP assignment can promote the technological innovation and economic development of some countries with backward technologies. Vishwasrao (1994) has also done related research on IP. However, the study of IP assignment is mainly conducted from the perspective of contract. Xu and Xu (2015) explore relevant laws applicable to overseas IP assignment contracts. Guo (2014) analyzes the problems existing in IP assignment concerning foreign countries, and points out that there are some contradictions between China's IP Laws and foreign IP Laws. Wang (2010) conducts in-depth research on IP assignment contracts, makes a systematic analysis of the conclusion, terms, validity, performance, responsibilities, and other aspects of IP assignment contracts, and lays a theoretical foundation for IP assignment contracts. Qiu (2011) analyzes the features of IP assignment from the perspective of legal act.

It can be seen that the research on IP assignment is mainly carried out in three aspects, namely, patent assignment, trademark assignment, and copyright assignment. This part will review IP assignment in these three aspects in a systematic way and elaborate on relevant research status of the process of IP assignment, so as to lay a theoretical foundation for subsequent study.

2.4.1.1 Patent Assignment

Patent assignment usually refers to the process where the patentee signs a contract with the assignee, assigns the ownership of invention to the assignee, and charges a certain amount of assignment fee. After the completion of assignment, the assignee will become the new owner of the patent, and the original patentee will no longer have the control right over the patent. In many cases, patent assignment only occurs in the process of merger & acquisition, or bankruptcy. Research on patent assignments is carried out to analyze the potential problems in the process of patent assignment, including problems in legal contracts, potential legal problems in the process of patent assignment, economic problems in the assignment process, such as assignment pricing and assignment way, and some empirical research problems in relation to patent assignment.

Different scholars have conducted research on legal contracts of patent assignment from

different perspectives. Based on the legal disputes in the process of patent licensing and assignment, Liu and Liu (2015) research the problems in patent licensing and assignment from the perspective of both sides, and propose to reduce relevant risks through emphasizing information integrity and improve the standardization of contract. Cheng (2006) analyzes the issues in the trial of patent assignment, summarizes top ten issues to provide theoretical reference for the trial of patent assignment contracts. Liu et al. (2012) carry out research on several problems of patent portfolio assignment contracts from the perspective of patent portfolio, and focuses on law application issues in the case that some patents become invalid or there is a breach of contract in the process. He et al. (2006) research the relationship between patentee and assignee in the assignment of patents, points out the property relationship as well as rights and obligations for the transaction parties before and after patent transactions. Chen (2003) analyzes the backward patent market, deficiencies of patent inventor and investor, and other problems, proposes relevant countermeasures in terms of docking of patent and capital, and constructs a patent market with China's characteristics. In addition, after reviewing the status of IP protection, Magic (2003) discusses IP protection issues from the perspectives of developed and developing countries.

Some scholars have also researched relevant economic issues of patent assignment. In consideration of patent assignment contract price, Li (2010) conducts case study of Sany Group, analyzes the problems that occurred in the IP assignment price process, proposes IP assignment pricing strategy in contract-based R&D and cost allocation, and suggests that the pricing management in IP assignment should be enhanced. From the perspective of patentee economic rationality, Wu and Gu (1996) analyze three kinds of patent assignment pricing, including profit sharing, fixed patent royalties based on the number of products, and combined pricing of profit sharing and fixed patent royalties. They finally find out the strategy choice with maximum assignment fee. Zhang (2005) adopts game theory to research on which kind of patent assignment enterprises should choose under different conditions of innovation, and concludes that unit assignment fee is the optimal assignment mode for enterprises. Li (2007) also summarizes three patent assignment modes through analyzing the pricing mechanisms of patent transactions, including outright purchase mode, gain sharing mode and the combination of outright purchase mode, and gain sharing mode.

In addition, some scholars have conducted empirical analyses on IP assignment. Gao et al. (2013) have analyzed technology assignment and mode since 2006. The result shows that

there is overlapping management in China's patent assignment management system, patent assignment takes up a small percentage in both technology transaction and low efficiency, and most assignees are individuals and companies. Serrano (2005) uses the data of patent assignment to study IP assignment, he concludes that 20% of American patents are transacted at least once within their economic lives, and better patents got more chances to be transacted and so on. Meanwhile, Serrano has also built a specific model to explain these facts.

2.4.1.2 Trademark Assignment

Trademark assignment means that a trademark registrant assigns the exclusive right to use a trademark to other party in accordance with statutory procedures within the validity period of the trademark. There are many advantages in trademark assignment. For example, relevant manufacturers can use the trademark within a shorter time, and avoid uncertainty in the process of trademark registration. Meanwhile, trademark assignment also has many disadvantages. For example, there are some people scrambling for trademark registration, resulting in a waste of trademark resources.

Registered trademark assignment includes combined assignment and free assignment. The distinction is that whether the relevant business of trademarks should be assigned in the assignment of trademarks (Guo, 2012). Pi (2009) believes that the basic function of a trademark has shifted from the basic identification function to the representation of the quality of goods or services and the competitiveness of goods, and the main trademark assignment principle has also shifted from the previous combined assignment to free assignment. Peng (2011) holds that the assignment value of trademarks mainly relies on its inherent business reputation, and trademarks are closely related to its business reputation. Without business reputation, a trademark is only a symbol, and its value will depreciate significantly, which implies combined assignment principle.

Xu (2006) discusses the problems that occurred in the process of trademark assignment and proposes some countermeasures against these problems. Qiao (2004) analyzes the principles and types of trademark assignment, disputes of trademark assignment, and corresponding legal solutions, providing theoretical reference for trademark assignment. Feng (2012) studies fundamental questions on trademark assignment, including legal character of trademark assignment and trademark assignment contracts. Liu (2003) makes a detailed analysis of the legal issues occurred in the process of trademark assignment, points out some defects in trademark assignment process, and proposes some measures to overcome these

legal issues and some suggestions for the legislation about trademark assignment system. In the process of trademark assignment, publication is also a very important part, because it directly determines whether the assignment of a registered trademark has been truly completed. Sun and Qu (2012) conduct research on the publication system of trademark assignment, such as the registration as the requirement of validity of a contract, registration validity doctrine and so on. They believe that China's registered trademark assignment publication is the requirement of registration validity, and provide corresponding countermeasures to solve the problems on the registered trademark assignment publication.

With regard to trademark assignment risks, Zhang (2008) has conducted analysis on the legal risks of trademark assignment, risks in whether the trademark to be assigned is borne with encumbrance.

2.4.1.3 Copyright Assignment

Copyright assignment refers to the legal act that the copyright holder assigns part or all of the property rights of copyrights to others (Zheng, 2009). Copyrights can be assigned free of charge or with compensation during the period within the term of copyright protection. The choice of copyright assignment should be determined based on the actual situation of the assignor and the assignee. After the assignment of copyrights, the original holder shall no longer enjoy the ownership of the property rights of the copyrights. On the contrary, the assignee shall have the ownership of the assigned part of the copyrights.

The research of copyright assignment is mainly focused on the issues related to copyright law and the problems in copyright assignment. Shen and Fang (1997) analyze the international copyright assignment and propose legal countermeasures to deal with China's copyright assignment problems. Some scholars have explored and discussed the future copyright issues. For example, Liu and Cong (2007) discuss future copyrights and relevant assignment issues and believe that future copyright assignment will not extend beyond the scope of the copyright law. China's current copyright law can solve problems on future copyrights and copyright assignment with no need to add extra provisions. Mu and Su (2004) set forth civil law foundation for future copyright assignment, demonstrate the feasibility of future copyright assignment, and provide a theoretical basis for it, so as to provide guidance for practice.

2.4.2 IP Licensing

Licensing is the granting of permission to use the IP holder's IP, usually temporarily, as opposed to the sale of the property. IP licensing is quite different from physical goods' licensing, because of its invisibility, ready appropriability and divisibility (Posner, 2004).

IP licensing refers to the assignment of the property rights of IP by IP holders without assigning the ownership. IP licensing is an important way to gain benefits for IP holders, either small enterprises or large international enterprises. For example, the income of Qualcomm in 2013 was $24.87 billion, and its total patent licensing fee was $7.88 billion, accounting for more than 30% of its income. And its patent licensing fee accounts for nearly 69% of its profit before tax (Luo et al., 2014).

The research of IP licensing mainly focuses on the legal status and economic strategy. The relevant research on IP legal status mainly includes essential legal connotation of IP licensing (Wu, 2006), IP licensing classification criteria (Qu, 2006), anti-monopoly aspects of IP licensing (Wang, 2007; Meng, 2012); IP licensing economic strategy focuses on IP license fee strategy (Kamien et al., 1992; Wang, 1998; Sen, 2005).

2.4.2.1 IP Licensing Classification

There are different classification criteria for IP licensing, and it can be divided into different categories in accordance with different criteria. Based on the scope of IP licensing right, IP licensing can be divided into simple licensing, solo licensing, exclusive licensing, and cross-licensing (Bing, 2009; Wen, 2012), the views of which are as followings.

Simple licensing is also known as general licensing or non-exclusive licensing. It refers to a form of implementation of one piece or several pieces of IP licensing in the agreed form and within specific time and territorial scope. Meanwhile, the licensor also reserves right to use such IP within the same time and territorial scope or grant any third party the right to utilize the same. In accordance with regulations, simple licensing has the following characteristics:

a. The licensee can use the licensed IP in accordance with the provisions of the contract, but shall pay license fee to the licensor in the agreed form and amount;

b. The licensor can, in accordance with provisions of this licensing, allow others to use the same IP to gain appropriate licensing fee;

c. After obtaining the approval of the licensor, the licensee can grant licensing to other licensees as licensor, namely sub-licensing, and the licensor can share the licensing

revenues.

Simple licensing is the least right that IP licensor restricts the licensee. In general, under this situation, the licensor charges a relatively small amount of licensing fee. Besides, the IP licensing without specifying its nature is generally regarded as simple licensing.

Sole licensing refers to a form of implementation of one piece or several pieces of IP licensing within specific time and territorial scope. Meanwhile, the licensor shall not utilize this IP within the same time and territorial scope or grant any other party to utilize this IP. Such licensing has the following characteristics:

a. In accordance with the agreements of this licensing, the licensee can solely enjoy the ownership of the IP within specific time and territorial scope. Besides, as the licensee enjoys higher level of the IP, it shall pay higher licensing fee while utilize the IP;

b. IP holder shall not allow any other party to utilize this licensed IP, nor utilize this licensed IP themselves;

c. This licensing mode usually charges more licensing fee than simple licensing and does not facilitate the popularization of new brand or technology. So sole licensing is rather rare in practice.

Exclusive licensing refers to a form of implementation of one piece or several pieces of IP licensing within specific time and territorial scope. Besides, the licensor reserves the right to implement this IP within the same time and territorial scope. But they cannot allow any third party to utilize this IP. Exclusive licensing has the following characteristics:

a. The licensee can utilize the licensed IP under the agreed conditions but shall pay corresponding licensing fee; meanwhile, such IP can only be exclusively used by the licensee and shall not be licensed to others;

b. Exclusive licensing is actually a licensing mode to exclude IP owner and licensee utilize the IP.

Cross-licensing is that the contracting parties or each party to an IP contract mutually license their own IP. Cross-licensing usually occurs when the licensor gives IP licensing to the licensee and the licensee makes technological improvement needed by the licensor. In addition, cross-licensing also occurs in joint development and manufacturing. There are two contradictory features of cross-licensing. On one hand, it encourages competition and development through complementary technology, thus reducing cost and eliminating various

obstacles. On the other hand, it can help competing parties understand the latest advanced technology of each other, so as to restrict competitive behaviors. Cross-licensing is quite common in complex products, for instance, the ICT industry. But it needs both sides of the license to balance in power. "*LCFs (Late-comer firms) need at least enough patents to get to the table, a formidable undertaking. Existing players need not admit another unless it has 'blocking', patents on some valuable novelty that they cannot quickly invent round*". (Xiao et al. 2013:751)

2.4.2.2 The Economic Effects of IP Licensing

IP licensing is the focus of IP strategy. IP owners can make up for its cost or gain excess profit through gaining corresponding revenue, while the licensees can acquire corresponding technologies or brands. These are closely linked with the economic benefits of IP.

With regard to the research under the condition of information symmetry, Nagaoka and Kwon (2006) indicate that under some reasonable assumptions, compared with other one-way licensing, cross-licensing is more popular among large enterprises with information symmetry. Antelo (2003) discovers that information asymmetry between the licensor and the licensee is one of the important reasons for the emergence of licensing, and proposes that licensing can bring more revenue for the licensor. Meanwhile, this kind of information asymmetry between the licensor and the licensee may lead to opportunism. Gallini, Wright (1990) and Beggs (1992) have conducted research on this from the perspective of private information, information game, etc. Antelo (2009) researches on licensing information asymmetry and believes that the selection of patent fees and contract term can avoid or reduce the occurrence of opportunism.

With regard to economic strategy of IP licensing, Kabiraj (2004) analyzes product market in the Stackelberg model and discusses the optimal licensing contract issues from the perspective of inventors. Erkal (2005) studies the optimal licensing strategy in differentiated industry and believes that there will be no technological transfer licensing in the case of small innovation size and low enough differentiated degree of products. Because only when companies adopt licensing with fixed fee, such licensing is efficient as expected. By comparing some licensing strategies, Costa and Dierickx (2002), after comparing some license strategies, such as self-pricing strategy and bundling licensing strategy, conclude that bundling licensing strategy might be a complementary strategy and an effectively incentive strategy. Motohashi (2008) analyses IP strategies, and the result shows that there is a

non-linear relation between firm size and licensing tendency; small enterprises with fewer complementary assets tend to make more licensing; meanwhile, due to the effect of cross-licensing, large enterprises have higher level of licensing tendency.

Some scholars have conducted analysis on IP licensing risks. Dratler et al. (1994) believe that there are considerable risks in licensing for patent owners, who might lose the control of technological development after licensing and depend on others for the potential income of the patent.

Finally, scholars also analyze the impact of IP licensing on market efficiency and social welfare from macroeconomic. Arora and Fosfuri (2003) think that licensing is the result of business strategy competitive behaviors, which changes the form of incentives. Companies may license their technologies to their potential competitors. In particular, when there are holders with several patents, there is competition in both product market and patent market, so it will promote the competition of licensing market and improve licensing market efficiency. Filippini (2005) adopts the optimal linear licensing to analyze the patent owners' output and its impact on social welfare in the case that patent owners are the Stackelberg leaders. The result shows that the licensing mode to achieve maximum profit for patentee is licensing with commission, optimal licensing mode maximizes the possibilities of technology transfer and reduces social welfare, thus providing a worse environment for the consumers, and inventors gain profits depending on their own technological advantages. Sen and Tauman (2007) conduct research on cost-saving simple licensing mode and show that licensing can make the environment of consumers better and the environment of enterprises worse, but the social welfare will improve eventually.

At present, a dilemma faced by patent owners is that they might license patents to their competitors, resulting in fiercer competition and reduced profits. Hausman and Leonard (2007) research on the reduced profits and measure the impact and the reduced profits through econometrics, so as to determine licensing fee can drive licensors to carry out licensing. Hoe and Diltz (2012) assess the licensing issues in pharmaceutical industry by real option approach.

2.4.2.3 The Advantages and Disadvantages of IP Licensing

The impact of IP licensing on market competition is a double-edged sword. On one hand, it plays an active role in promoting competition in the market with its unique business value. On the other hand, problems such as monopoly, obstruction, violation or distortion will be

derived from IP licensing, which need to be regulated.

Some scholars research the advantages of IP licensing and believe such advantages mainly lie in three aspects. First, IP licensing can facilitate participants' access to market, and expand the market rapidly. Second, it can promote the standardization to prevent legal disputes with other businesses, thereby reducing costs. Finally, it can promote the competing companies to learn from each other, so as to improve technological level and increase their market profit margins (Lv, 2013; Pitkethly, 2001).

The disadvantage of IP licensing is mainly the abuse of rights (Ren, 2012). Many cases show that IP holders may impose unequal requirements on the licensees. Some of these unequal requirements violate IP laws, and some may be obviously unequal behaviors. For example, Qualcomm has many core patents in ICT industry, and it mainly profits from patent licensing fees, which is its core business model. For many years, Qualcomm has been accused of abusing its dominant market position. In early 2015, China's National Development and Reform Commission imposed a fine of RMB 6.088 billion Yuan on Qualcomm for its abuse of IP. It is a typical case of the abuse of IP licensing (Zhu, 2015).

2.5 How to Set the Price: IP Valuation

The companies are able to enhance the value of IP through creation, protection, utilization, and management. Meanwhile, the countries are able to enhance their international competitiveness and status through international protection and investment of IP. Specifically, during the utilization of IP, enterprises can obtain financial support through IP securitization and collateral loan. If the value of the IP could not be reasonably assessed, it would be difficult to utilize successfully. As to the valuation of IP, it is necessary to make analysis on the assessment methods, such as the scope, the advantages and disadvantages of each assessment method. Overall, IP assessment can be divided into qualitative valuation and quantitative valuation. Qualitative valuation method is mainly based on the strength, width, and legal attributes of IP. The valuation is made by the way of rating or scoring, which tries to assess IP by some quantifiable parameter index. Compared with quantitative valuation, the qualitative valuation method is relatively simple, so it is usually adopted for internal IP management. Quantitative valuation method can be divided into three traditional approaches,

i.e. cost approach, market approach, and income approach, and a new dynamic evaluation option approach.

2.5.1 Cost Approach

Cost approach is an approach to estimate the value of IP by calculating all the expenditures in the process of creating the IP (Matsuura, 2004). These expenditures include material expenses, management expenses, and development expenses and so on. Cost approach is the most direct and easiest method for accounting the value of IP. It assesses the IP from the perspective of traditional management accounting. As long as the data in the creation of IP is available, the assessor can assess the IP based on these data. Through simple accumulation, the value of IP can be arrived at through the comparison and adjustment of the market situation before and after.

Literature shows that the cost approach can be divided into replacement cost and reproduction cost (Mard et al., 2000). Replacement cost method refers to imagining of re-creating an IP with the same function, and calculating the cost spent on the IP. In other words, replacement cost is to calculate the expense of re-creating such IP. Reproduction cost method has stricter requirements, which refers to the calculation of cost on reacquiring the same IP.

The basic formula of the cost method can be expressed as formula 2-1 and formula 2-2.

$$V = C \times \alpha \tag{2-1}$$

$$C = \sum_{i=1}^{n} C_i \tag{2-2}$$

Among which, V refers to the value of IP to be evaluated; C refers to the sum of expenditure during the creation of the IP; α refers to the adjustment factor in the valuation date of the IP, which usually takes the price level when the IP is formed as its benchmark, and makes appropriate adjustments through the price level of the evaluating day; n refers to the expenditures required for the development of the n item IP; C_i refers to the term i actual expenditure out of the n item during the formation of IP.

In addition, many IPs are the complex of intellectual capital, and their formation depends primarily on the intellectual input of IP developers. Therefore, the value of these IPs cannot be simply calculated by the above formula. The commonly used formula can be expressed as

formula 2-3 (Niu, 2012).

$$C = \frac{C_0 + \beta_1 V}{1 - \beta_2} \times (1 + L) \tag{2-3}$$

Among which, C refers to the replacement cost of IP to be evaluated; C_0 refers to the materialized labor consumption in the process of IP creation; β_1 refers to the multiplying factor of IP owners' creative work, which is a positive real number, and it indicates the creativity of the IP. The normal work value is 1. If the IP can save 50% cost or double the efficiency, the value of β_1 is 2; V refers to the active labor consumption in the process of IP creation; β_2 is the average risk factor of IP, the range of which is from 0 to 1, and the higher the risk of IP creation, the bigger value of β_2; L is the rate of return on investment of this IP.

Although the cost approach is simple in the process of accounting the IP value, the result does not always satisfy the assessors and other parties. First, the value of IP is not directly related to the development costs of the IP, and the total cost of the IP does not equal the potential benefits. Second, as some IPs are co-developed, it is difficult to distinguish which expenditures are attributed to the valuation of the underlying IP, resulting in the difficulty in measuring the value of individual IP items. Third, the lack of relevant data may lead to the difficulty in obtaining complete information to assess IP; fourth, the adjustment factor in the accounting of IP is very subjective, different assessors may arrive at different results for the same IP.

2.5.2 Market Approach

Market approach, which is also known as comparative approach. It needs the evaluator finds the same or similar IP in the IP market as a benchmark, compares it with the IP to be assessed on their legal attribute, technical features, functions, and then assesses the value of IP. There are a few important prerequisites in the practice of market approach. First, the IP shall be an active property in the marketplace. Second, the same or similar comparable IP transactions can be found in the market. Third, the transaction information shall be effective and available. Fourth, all the transactions must be independent from each other (Lagrost et al., 2010).

The results of IP valuation under the market approach are generally considered the most ideal. The price determined through market approach is tested by the market, and it is the equilibrium price of supply and demand obtained by the competitive bid in a market by all the

participants. The result is practical, and easy to be accepted by the parties. In addition, the calculation of market approach is not complex for it does not need too many mathematical models or too much financial data. It is a balanced result obtained from the competition of all the parties through the economically rational analysis. Therefore, the market approach is considered as one of the most effective ways to assess IP.

Although the result of the market approach is ideal, it is difficult to practice. As a result, the real cases of valuation through the market approach are rare. Firstly, although the IP market has been established in China, it is neither mature nor active at all. In other words, an active IP transaction market is still absent in China. Second, due to the special nature of IP, it is very difficult to find the same or a similar transaction. Even though it can be found in the market, the detailed information of such transaction is very difficult to obtain. Finally, in many cases, IP transactions are not independent cases. In other words, IPs are usually transacted in portfolio, which lead to the difficulty of measuring the value of each IP. Therefore, the market approach of IP valuation is seldom used.

2.5.3 Income Approach

Income approach is also known as discounted cash flow (DCF), which is derived from the financial asset valuation approach. It refers to a method to add up all the cash flow in a certain validity period multiplied by a certain discount rate, and then get the value of IP. The underlying theory of the income approach is that the value of property can be measured by the present value of the net economic benefit over its life.

The income approach is the most commonly used valuation method. It focuses on the future cash flow derived from a particular IP. Dong and Li (2005) choose three representative cities of China, and collect relevant data to analyze the methods applied in IP valuation. Statistics have shown that nearly 70% of the IP valuation adopts the income approach. The basic formula of income approach can be expressed as formula 2-4.

$$V = \sum_{t=1}^{n} \frac{R_t}{(1+r)^t} \tag{2-4}$$

Among which, V refers to the value of IP; t refers to the year to which IP exists; n refers to the remaining years of the IP; r refers to the discount rate of the IP cash flow required in each future period; R_t refers to the cash flow income of IP in the t year of IP duration.

Some key things should be attention when adopting the income approach. First, the

assessor shall predict the IP's future cash flow of each year according to the past IP profitability. Second, the remaining economic lifespan of IP should be accurately predicted. Finally, the hardest and most important thing is to determine the appropriate discount rate for the corresponding cash flow of each year. The future cash flow and remaining economic lifespan can make appropriate prediction based on the specific economic environment and experience. But the determination of appropriate discount rate is relatively complex. Some scholars research on it. Schmusch and Laas (2006) propose the weighted average cost of capital (WACC) model. Brealey et al. (2007) express the formula of WACC as formula 2-5, which is the replacement of discount rate in income approach.

$$r_{WACC} = r_E \times \frac{E}{C} + r_D \times (1-t) \times \frac{D}{C} \tag{2-5}$$

Among which, r_{WACC} refers to the weighted average cost of capital, r_E refers to the cost of equity, E refers to the market value of equity, C refers to the market value of total assets, r_D refers to the cost of debt, t refers to the tax rate, and D refers to the market value of debt.

Although the income approach is often used for the valuation of IP, and is well recognized by the evaluators, it still has some limitations in practice. First, the future cash flow of IP needs to be predicted. Even though an assessor may be very familiar with the characteristics of IP and the market, the result of the prediction is not the real value. As a result, there are some inevitable deviations, which may be increased due to a sudden change in economic conditions of the market, and make the prediction become ineffective. Second, the effective economic lifespan of IP is closely related to the market. The economic lifespan will change as market conditions change, so it is difficult to determine accurately. Finally, the discount rate of the IP cash flow is difficult to determine accurately. For the same IP, the IP valuation result also varies when the evaluator chooses different ways to estimate the discount rate. Therefore, the ways to determine the cash flow rate need further exploration.

2.5.4 Option Approach

Cox et al. (1979) hold that "*an option is a security which gives its owner the right to trade in a fixed number of shares of a specified common stock at a fixed price at any time on or before a given date*". As there are deficiencies in the conventional valuation approaches of IP, the scholars continue to explore new valuation approaches. In recent years, a new dynamic IP valuation approach is constantly attracting the attention of scholars, which is the option

approach (Chang et al., 2005; Vallejo-Alonso et al., 2013). The commonly used option approaches include decision tree analysis, real option analysis, and monte carlo analysis. People consider that uncertain option rights in IP are valuable and can dynamically estimate the value of IP.

The formula of option approach is expressed as formula 2-6, formula 2-7 and formula 2-8.

$$V = PN(d_1) - I\,e^{-rT}N(d_2) \tag{2-6}$$

$$d_1 = \frac{\ln\frac{P}{I} + (r + \frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}} \tag{2-7}$$

$$d_2 = d_1 - \sigma\sqrt{T} \tag{2-8}$$

V refers to the assessment value of IP; P refers to the present value of expected benefits of IP; N refers to the cumulative normal distribution function; d_1 means the option sensitivity to the value of expected benefits of IP; I refers to the investment cost of IP; r is the risk-free interest rate; T refers to the remaining lifespan of the IP; d_2 is the possibility of the option to be executed; σ refers to the volatility of expected return of IP; The formula of N is as formula 2-9.

$$N(d) = \frac{1}{\sqrt{2\pi}}\int_{-\infty}^{d} e^{-\frac{y^2}{2}}dy \quad d_1 = \frac{\ln\frac{P}{I} + (r + \frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}} \tag{2-9}$$

The option approach is gradually arousing the attention of scholars due to its flexibility in management. However, there are shortcomings as well. First, it is difficult to calculate the present value of the expected benefits of IP accurately. Second, the volatility of the expected return is also difficult to be estimated. Therefore, the estimation of the present value of the expected benefits and the volatility of the expected return of IP are the focus of the option approach.

2.5.5 Summary of the Approaches

The above approaches are the commonly used four approaches in the IP valuation. In the particular process of IP evaluation, the assessors shall choose the corresponding evaluation approaches based on the characteristics of IP, so as to achieve an effective assessment.

Sometimes more than one approach is used for IP valuation. Therefore, the valuation cannot be limited to one approach, and several evaluation approaches can be used in one specific valuation process. In addition, for the same IP at different stages, different approaches can be used in the evaluation. Taking the patent for example, when the patent is in its early stages, cost approach can be used in its valuation. However, when it is developed and mature, market approach or income approach will be better. Thus, the choice of valuation approaches shall be flexibly chosen based on the specific evaluation process of IP, in order to make the evaluation value of IP closer to its true value.

2.6 Conclusions

This chapter analyzes the origin of IP transactions, traditional and innovative IP transaction models. Currently, e-commerce approaches have a profound influence due to its obvious advantages in reducing transaction costs, and many emerging IP transaction platforms are closely related to e-commerce. It is a feasible approach to solve the “dilemmas of IP transaction”. The evolution of IP transaction gives us a general understanding about IP transaction.

Then, this chapter has discussed the literature review regarding IP transactions, including IP tradability, transaction pattern and evaluation. The IP tradability focuses on the essential attributes and economic value of IP, which are different from common commodities. The characteristics of IP lie in intangibility, relative monopoly, restriction and uncertainty of rights. They cause IP assignment and licensing quite different from the commodity exchange. Different types of IP and transaction patterns have different transaction costs, so it is necessary to consider the attribute of different IP and adopt the suitable transaction pattern. Meanwhile, IP valuation is an important way to determine the IP’s benchmark price, which can help realize the maximum exchange value. This chapter summarizes the approach of cost, market, income, and option.

Based on the literature review, we have gained a understanding of the nature and potential of IP transactions. Chapter 3 sets up a view on IP transaction mechanisms, which can help understand the process and key elements of IP transactions in greater detail.

Chapter 3: Theoretical Model of IP Transaction Mechanisms

Chapter 2 provides a general understanding of IP transactions from the practical perspective, enables us to have a better understanding of IP transactions from the theoretical perspective. But we still know few about the process and focus of IP transactions, such as how to make IP transactions and who will participate in the transactions. In this chapter, I set up the theoretical model of IP transaction mechanisms to help us better understand the IP transaction process and key nodes. It mainly consists of the players in IP transaction market, the transaction cost, and e-commerce.

3.1 The Players in IP Transaction Market

The main players of IP transaction market include IP sellers, IP buyers, and IP transaction intermediaries. The IP sellers own the IP, including natural person, legal person, and entity without legal personality. They sell all or part of their IPs to others according to their own will within the limitation of law to obtain returns. The IP buyers, also including natural person, legal person, and entity without legal personality, are those who pay expenses to obtain all or part of IP. IP transaction intermediaries provide hardware and software facilities for sellers and buyers, help formulate and execute IP transaction contracts, so as to forge both parties of the IP transaction to conclude the deal and charge commission.

3.1.1 IP Sellers

In IP market, individuals, corporate entities, universities and research institutes are the major IP sellers. According to the statistics published by “I Think Tank” (2013), corporations accounted for 66.5% of all the right holders of patent transactions in 2013, the percentage of which for individuals, universities and research institutes, and others were 25.1%, 8.2%, and 0.2% respectively.

(1) Natural persons. Natural persons can become the owners of copyrights or patents. They can also be engaged in production or services, and become trademark owners after

applying for trademark registration.

(2) Legal persons. Legal persons can be deemed to be the right holders of copyrights. They can also become the patent holders based on the invention-creation. Meanwhile, legal persons are much more commonly seen in the trademark law relationship. Legal persons refer to corporate bodies of government, institutions, public organizations and social groups, among which enterprises are the most important right holders in IP transactions, whereas universities and research institutes are important in patent applications and licensing. Currently, sleeping patent in universities is a prominent issue. It results from universities' problem of paying more attention to patent application than utilization. What is more, there is a lack of effective patent transaction platforms to help universities commercialize the patents quickly and easily (Jian and Li, 2016).

(3) Entities without legal personality. Entities without legal personality refer to social organizations that are not qualified for being legal persons or are not registered as legal persons. These social organizations are generally not allowed to become the subjects of civil legal relations, but can become the subjects of IP legal relations. There are few IPs owned by entities without legal personality, which are not outstanding enough in IP transactions.

3.1.2 IP Buyers

IP buyers refer to buyers or the licensees in IP transactions, and mainly include natural persons, legal persons, and entities without legal personality, among which, corporations and individuals are the most important. The bargaining powers of various assignees lead to differences in the final price of IP transactions. Kelley (2011) research the patent marketplace in the U.S., and points out that there are three types of patent buyers with distinctly different motivations, patent assertion firms, defensive aggregators, and Intellectual Ventures (IV). In China, the situation is quite different. According to the statistics from "I Think Tank" (2013), enterprises, individuals, universities and research institutes, and others accounted for 85.0%, 7.7%, 6.4%, and 0.9% respectively of the assignees in China. Statistics in the report also show that enterprises are the most important assignees in patent transactions, whereas the patents provided by individuals, universities and research institutes outnumber those assigned by them in patent transaction.

3.1.3 IP Transaction Intermediaries

Intermediaries, including commercial banks, security companies, and insurance companies that are familiar to us, play an indispensable role in the financial market. Similar to the financial market, intermediaries also play an important role in IP transactions. Bailey (1998) considers that intermediaries are the participators to promote and coordinate transactions between producers and consumers and reduce the transaction costs. Lamoreaux and Sokoloff (2002) indicate that patented technologies transactions are facilitated by the emergence of intermediaries who economize on the information costs associated with assessing the value of inventions and help to match sellers and buyers of patent rights. The participation of intermediaries makes the one-time game become repetitive, reduces the transaction costs, and improves the efficiency of transactions. Even though many IP transactions are done by both parties in private, it is not an efficient way. As a result, the Thesis adds the intermediaries to the analysis of IP transaction models. Intermediaries refer to the legitimate agencies that provide the service of notarization, agency and information technology services to clients according to the professional knowledge and technical service. As an important component of the market economy, emergence of intermediaries is an inevitable result of the highly efficient market operation and professional division of labor. In IP transactions, intermediaries provide such services as collecting the information of the right holders, looking for the assignees, and liaising with the right holders and the assignees, and charging commissions. They can be considered as the lubricant of IP transactions. Intermediaries can also effectively lower the search cost and information cost in IP transaction process, and enable the right holders and assignees to conclude the deal quickly. IP transaction intermediaries provide clients with various kinds of IP-related services such as information consulting and rights evaluation. To be specific, they release IP transaction information and host IP transaction exhibitions to help make the match between right holders and assignees.

Demsetz (1968) discusses the requirements of the intermediaries to achieve economies of scale and specialization from the view of transaction cost. He believes that the intermediaries are the necessary condition for the realization of the scale economy and specialization. Transaction intermediaries are not limited to commodity transaction intermediaries. Some scholars have also researched service intermediaries. Benassi et al. (2010) analyze the patent and technology transaction intermediaries using transaction cost theory and competitive advantage theory, and point out that they can promote transactions, and intermediaries are the

best choice for patent and technology transactions. Hagiu and Yoffie (2011) discuss the intermediary role of patent transaction platforms, point out their limitations from the current situation of patent transactions, and analyze the development potential.

Currently, the intermediaries are mainly composed of IP intermediaries and operating intermediaries. The service capabilities of intermediaries also make a huge contribution in concluding IP transactions. By the end of 2015, the number of trademark agencies in China had been 23,721 (The State Administration for Industry and Commerce, 2016), and that of patent agencies had exceeded 1,200 (The State Intellectual Property Office of China, 2016). These agencies also function as IP transaction intermediaries while providing general IP agency services. Meanwhile, there are some new IP operating intermediaries established in the market. They obtain IPs from the holders, and then acquire benefits from licensing or selling the rights. They are becoming a vital force in IP transactions. Nevertheless, the IP intermediaries have a high diversification and the industry concentration ratio remains at a low level. Due to the small scale of intermediaries, there has been no IP transaction platform with outstanding influence in the industry, and the services provided by intermediaries cannot provide enough support for IP transactions.

3.2 The Transaction Costs and E-commerce

In the market economy, transaction is an important way to improve the efficiency of resource allocation. Transaction costs may exist in every transaction process, and may also exist in every aspect of transaction. Meanwhile, transaction costs may exist between buyers and sellers. The more frequent the IP transactions are, the more effective IP utilization will be, which will eventually promote technological innovation. In reality, there are transaction costs in all transactions. Although it is impossible to lower the transaction costs to zero, the reduction of which is always the internal power of the market, and the foundation and driving force of the survival and development of property market (Wu, 2015b). Under the premise of clear property ownership, optimized resource allocation relies on the lowest transaction cost. Currently, China is facing the difficulty of IP commercialization and industrialization. From the point of economics, transaction costs have become a key factor affecting the transaction. Thus, it is particularly important to analyze transaction cost. On the other hand, e-commerce can play a huge role in reducing transaction costs. Analyzing transaction cost in the context of e-commerce is of instructive significance to IP transactions.

3.2.1 The Definition of Transaction Costs

Transaction cost is the focus of the research on transaction mechanisms, and it is an important concept in Economics. It is generally believed that the concept of transaction cost was first put forward by Coase (1937), making the formation of the theory of transaction cost. Coase introduces economic theories to analyze transaction cost, which expands the view of economics. He points out, in order to carry out market trade, it is necessary to find out who wishes to trade, people's willingness and ways to do trade, conclude contracts through bargaining and negotiation, and urge the strict execution of the contract terms. Based on this, transaction cost can be summarized as the cost of contract preparation, the cost of the decision to sign the contract, and the cost of supervision and performance of the contract. Coase (1960) points out in *The Problem of Social Cost* that if ownership is clear and market transaction cost is zero, the market mechanism will lead to a Pareto Efficiency outcome. This is the famous Coase Theorem. In the late 1960s, more and more economists analyze transaction cost. Williamson (1975, 1985) researches the transaction cost from three aspects. First, he establishes the basis of transaction cost economics based on Coase. Second, he creatively proposes transaction cost analysis tools. Third, he clears the basic strategy for transaction governance. He also divides the transaction cost into two parts: before signing the contract, the transaction cost of draft contract, the contents of the contract negotiations and the cost of ensuring the contract are to be carried out; after signing the contract, the transaction cost includes bargaining cost, starting and running costs, as well as guarantee costs. Zhang (1999) points out that transaction costs can be seen as a series of systems' costs, including information costs, negotiation costs on developing and implementing contracts, cost on defining and controlling ownership, supervision and management cost, and institutional structure change costs. Briefly, transaction cost refers to everything not directly occurred in material production process.

The core of transaction cost theory explains transaction costs and suggests ways to minimize them. The existence of market transaction cost results in low efficiency of resource allocation. Therefore, the effort to reduce the transaction cost becomes the organizational structure and organizational behavior in the market economy. The basic concept and analytical method of transaction cost theory have been widely accepted by economists, and the theory has been enriched and developed constantly, which has formed the transaction cost economics. On this basis, property right economics is established. Transaction cost economics

and property right economics have become the branches of new institutional economics, and transaction cost theory has become the theoretical basis of property right economics and new institutional economics.

3.2.2 IP Transaction Costs

A well-functioning transaction mechanisms and a sound transaction platform will inevitably lead to reduce transaction costs and save time and cost for the buyer and the seller, thus increase benefits for them. However, this kind of "ideal market" only exists in theory. In reality, there is cost in any transaction. A sound transaction mechanisms and transaction model will undoubtedly significantly lower transaction cost. Based on the theoretical analysis of transaction cost and taking into consideration the special characteristics of IP transaction, IP transaction cost mainly includes information cost and contract cost. And agencies can significantly lower these two kinds of cost.

Information cost in IP transaction cost mainly include the information of the transaction subject and the transaction object. Prior to IP transaction, the two parties of the transaction need to look for each other. For the two parties of IP transaction, a lot of information needs to be obtained in advance, such as who needs or owns the IP; is it an individual or an enterprise; and how should the owner be contacted. The legal status values and validity term of IP belong to the information of the transaction object. Some information can be searched through authorities, such as the IP owner, legal status, and validity term. But some information can hardly be obtained, such as the contact information and IP values. The difficulty of obtaining such information increases transaction cost. Through concentrated collection and release of transaction information, and provision of IP consulting and evaluation services, agencies can significantly lower the transaction cost.

Contract cost is the cost spent by the two parties of the transaction on reaching an agreement. After the two parties of IP transaction reach preliminary intention, they need to sign agreement on transaction price, period of contract performance, and ways of contract performance. In IP transaction, relevant registration and filing procedures need to be gone through. For example, Article 10 of the *Patent Law* regulates that the assignment of the right to apply for a patent and the patent right shall take effect as of the date of registration. Article 42 of the *Trademark Law* stipulates that the assignment of a registered trademark shall be announced after it is approved. The assignee shall enjoy exclusive right to use the mark

starting from the date of publication. All these have increased IP transaction cost. Agencies are able to significantly lower cost for the two parties of transaction and eventually lower the contract cost in transactions by helping formulate transaction contract, monitor contract performance, and go through relevant official procedures.

3.2.3 E-commerce Intermediaries and Transaction Costs

Globalization and information technologies are radically changing the business and organization. Information technologies are being adopted and incorporated into nearly all organizations for the overall of business (Ngai and Wat, 2002). Which means e-commerce is more and more common in the economy. E-commerce intermediaries emerge with the application of e-commerce in IP transaction. Since the emergence of e-commerce in the 1990s, it has become an important part of the modern economy. Sarkar et al. (1995) believe that e-commerce intermediaries are agencies that use the internet to provide information. Huang (1999) holds that e-commerce intermediaries are organizations that play the role of an agency in e-commerce market based on the internet. E-commerce intermediaries fulfill all the functions of traditional agencies based on internet and also possess some new functions that traditional agencies cannot provide. With the advantages of internet in information processing, e-commerce intermediaries can significantly reduce search cost in transactions. Besides, due to the low internet entry criteria, there is a lack of face-to-face communication between the two parties of the transaction. Thus, information asymmetry will be more serious, leads to adverse selection in transaction. Therefore, the focus of e-commerce transaction intermediaries is how to reduce information asymmetry for the two parties of the transaction despite their advantages in lowering search cost.

In IP transactions, due to the uniqueness of the transaction object, e-commerce will have prominent value in lowering search cost. Besides, due to the intangibility of the transaction object, information asymmetry will be more serious. Reducing information asymmetry is the key to successful IP transactions. By analyzing representative online knowledge transaction organizations Yet2.com and Tynax, Dushnitsky and Klueter (2011) point out the need to reduce adverse selection in e-commerce intermediaries. Through the combination between online and offline with online market lowering search cost and the offline market reducing information asymmetry, IP transaction platforms can facilitate IP transactions to the maximum extent. This model is the O3 IP transaction mechanisms.

In IP transactions, information cost is the most important transaction cost. By relying on the advantages of the internet in information collection, gathering, and processing, e-commerce enables information to be concentrated for the two parties of the transaction to search, thus reducing the difficulty of obtaining information and significantly reducing information cost in transactions. Besides, information search is also in line with the rule of diminishing marginal utility. In other words, with the increase of information mastery level, the cost of obtaining the information of the same value will increase. Therefore, e-commerce has advantages that are more obvious in information. Thus, the prominent value of e-commerce to IP transactions lies in its ability to effectively lower information search cost and increase the efficiency of information search efficiency.

(1) The Definition of E-commerce

Since the commercial application of Internet in 1995, e-commerce has rapidly developed. E-commerce has undergone stages of infancy, development, foam, and rational development. Its business model has been constantly innovated, and the market is also growing. This new transaction pattern of e-commerce has shown its great potential for development. There are many definitions of e-commerce, and one general definition is offered by Treese and Stewart (2003: 5), who describe it as "*The use of the global Internet for purchase and sale of goods and services, including service and support after the sale*". The definition emphasizes the Internet as a medium for enabling end-to-end business transactions, and applies equally well in dot-com, Internet-only business settings, as well as more traditional business settings where the new channel of the Internet is being used together with existing channels.

(2) E-commerce Intermediary Services

As independent socio-economic organizations in modern market economy system, intermediaries are gradually separated from other economic activities with the development of social productivity, social division of labor, the ever-growing diversification of the needs of the human society, and the development of technological advancements. E-commerce platforms can build a huge network platform by taking advantage of its information, capital, technology and talent. The front-ends and back-ends of e-commerce platforms are connected with buyers and sellers. Such platforms are transaction intermediary platforms providing buyers with a variety of products or service information, and helping sellers publish all kinds of products or services. E-commerce platforms such as T-mall.com, JD.COM, and Amazon are all transaction platforms between buyers and sellers through the Internet. They have

developed into large enterprises.

(3) E-commerce Transaction Costs

The biggest characteristic of e-commerce is the direct "face-to-face" interactions between producers and consumers. E-commerce greatly reduces the intermediate links of transactions. The supply and demand parties are able to obtain more information in the drafting, negotiation, guarantee and signing of an agreement so as to reduce the risk of uncertainty and the transaction cost before reaching the agreement. On the other hand, e-commerce helps transaction bodies to discover the violation of contract in a faster, easier and more economical way, thus reducing the probability of disputes as well as the post-transaction costs arising therefrom. Meanwhile, e-commerce enables management organizations to be managed in a soft and more flexible manner, so that the institutional and non-institutional cost for reaching transaction agreements can be reduced, which further reduce the transaction cost after reaching an agreement. To sum up, the greatest feature of e-commerce is to reduce transaction cost, and help control the risk of uncertainty in the transaction process. Therefore, e-commerce can effectively reduce transaction cost.

(4) The Applicability of E-commerce in IP Transactions

IP transactions are one of the most suitable commodities that can be traded through e-commerce. Since IP does not require logistics support and can be fully digitized, it can take full advantage of e-commerce to make IP transactions better, safer, faster and more efficient. It can be inferred that e-commerce is the best choice for IP transactions.

a. It ensures the legality of IP transactions. The ownership assignment of IP is not similar to that of consumer products, which is characterized by exchange of money with goods. There are no material goods that can be delivered in IP transactions. Both parties shall sign an assignment agreement and report to relevant authority for approval. IP transactions through e-commerce platforms ensure the compliance with laws and regulations, and protect the interests of both parties.

b. It ensures the authenticity and security of IP transactions. With increasingly sophisticated network security technology, the payment and the IP security can be protected during online transactions.

c. It monitors the transaction process. Through a series of techniques, the whole process of a transaction, including quotation, inquiry, bargaining, payment and delivery is

under surveillance in order to ensure the transaction.

d. It provides fast, convenient and efficient services. The application to final approval of relevant authority process needs a long time, and e-commerce platforms can provide great convenience for those who have urgent needs for IP.

3.3 IP Transaction Model

As analyzed above, the IP transaction model that directly shows the process of an IP transaction is summarized in Figure 3-1 below.

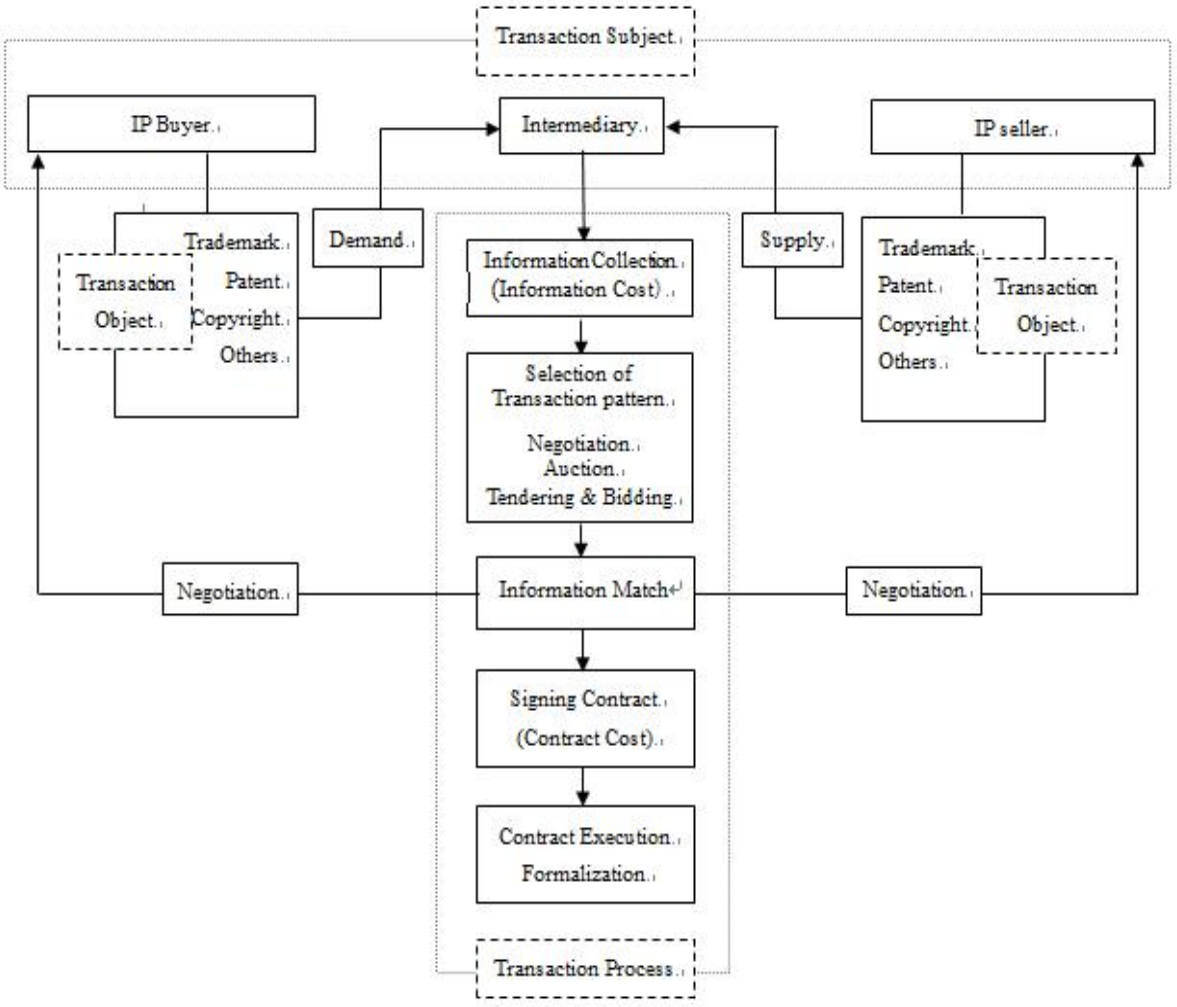


Figure 3-1: IP transaction Model Based on Intermediaries

Source: This Thesis.

First, the IP seller owns IP such as patents, trademarks, and copyrights, which are the transaction object. IP sellers are the suppliers in transaction. They entrust an IP intermediary to assign or license its own IP to others. IP buyers are the demanders in transaction. They entrust intermediaries to find the needed IP such as patents, trademarks, and copyrights they need. To be specific, IP buyers, IP sellers, and transaction intermediaries are IP transaction subjects, and such as patents, trademarks, and copyrights needed by IP buyers are the transaction objects.

Second, the intermediary shall search the information regarding the IP and the demand of the assignee through the network and the database owned by the platform. By taking advantage in information collection, sorting, and processing as well as the e-commerce model, the transaction intermediaries can significantly reduce the IP transaction information cost.

Third, the transaction intermediary shall select an appropriate transaction pattern in accordance with the requirements of the IP holders and the characteristics of the IP. The transaction patterns include negotiation, auction, as well as tendering & bidding. And usually they will choose negotiation transaction pattern.

Fourth, after the successful match of the transaction information (such as type of IP and specific requirements of IP) of the buyer and the seller in the IP transaction, IP intermediary shall negotiate with both parties on the transaction price, transaction date, and contract terms, etc.

Fifth, while the two parties reach the intention on IP transaction, they shall sign a contract with the intermediary. The intermediary shall take advantage of its expertise, draft standard contracts in transaction, and revise the terms according to the negotiation. This process can avoid risks in transactions to the maximum extent, reduce contract cost by entrusting the intermediary to formulate contracts, and increase transaction efficiency.

Finally, after signing the transaction contract, the intermediary is responsible for monitoring the execution of the contract, and shall handle all formalities, such as approval of the assignment and filing of the permission. The IP transaction is completed after the corresponding registration.

3.4 Conclusions

This chapter sets up a theoretical model to understand the process and key nodes of IP transaction. The players can be clearly distinguished in this model; they are IP seller, IP buyer,

and IP transaction intermediary. The seller owns the specific IP. The buyer needs it to develop or invest. And the IP transaction intermediary accepts the delegation of two sides to facilitate transactions and charge commissions. In IP transaction, the transaction costs are the core issue. The IP transaction intermediaries can reduce the transaction cost by reducing the information cost and contract cost. So, they are indispensable to reduce the transaction costs in the context of sporadic subjects and massive IPs, because the information cost and contract cost are remarkable in this condition. Hence, this chapter can help to solve the transaction costs of "dilemma of IP transaction". Meanwhile, the theoretical model lays the foundation for mechanism optimizing.

The next two chapters discuss trademark transactions and patent transactions from the perspective of practice, which can bring beneficial supplemental understanding to more conceptual perspectives on IP transactions.

Chapter 4: An Empirical Study of the Existing Trademark Transaction

Based on the IP transaction model in Chapter 3, we have understood the process and key notes of IP transaction. Considering that the main types of IP transaction are patents, trademarks, and copyrights, and that copyright transaction is relatively scarce, Chapter 4 and Chapter 5 are dedicated to the research of trademark and patent transactions. As China Trademark Supermarket Website has become the platform with the most trademark transactions in China for many consecutive years, it has plenty of trademark transaction data. Therefore, this chapter is focused on the empirical study based on the transaction data from China Trademark Supermarket Website in 2013 and 2014. Econometrical method is employed to analyze the factors that influence trademark transaction price and the degree of influence.

4.1 Overview of Trademark Transaction

In China, trademark assignment outnumbers trademark license in general. So this chapter is dedicated to an empirical research of the data on trademark assignment. If everything goes well, the trademark registration process usually lasts about one year. After a long time of waiting, applicants are still confronted with the risk of the application for trademark registration being rejected, or being withdrawn because of the objection from a third party. Because of the huge uncertainty, trademark applicants dare not carry out large-scale promotion of the trademark before registration. Thus, in order to avoid the uncertainty of trademark registration, save time, launch products or services in time to occupy the market, trademark applicants prefer to buy a trademark rather than apply for a new one. In addition, some applicants may choose to buy trademarks because they find that other people have already registered the trademarks they intend to apply for in advance. In this context, the trademark transaction market is becoming increasingly active in China, with the emergence of some famous trademark transaction platforms. China Trademark Supermarket Website is a

typical representative.

China Trademark Supermarket Website was established in 2002. It is a leading online trademark transaction platform under CIPRUN. Now it offers over 10,000 trademark solutions to enterprises at home and abroad every year, such as trademark application, trademark opposition, trademark renewal, trademark name and address change, trademark withdrawal etc., and its volume of trademark assignment has ranked first for 14 consecutive years. China Trademark Supermarket Website takes the price difference as its charge fee, which means it is the transaction intermediary of the buyer and the seller. China Trademark Supermarket Website negotiates and reaches agreements with both parties, and the price difference between both parties' agreements is the source of the intermediary's income. Yang (2011) indicates that the price difference as the income has become the mainstream of all trademark transaction intermediaries. Besides China Trademark Supermarket Website, many other trademark transaction platforms, such as the HW-TM.cn and Zhiyiwang.com, all earn profit in this way. China Trademark Supermarket Website reaches purchasing agreements with buyers, and trademark assignment agreements with sellers. In the terms of both the purchasing and assignment agreements, trademark transaction bodies, transaction objects (trademark registration number, names or design of the trademarks, trademark classifications, trademark expiration date, descriptions of goods or services, etc.), price and means of payment (in order to reduce trademark transaction risk, the payment is usually divided into two or three times) and other information are included. The process of trademark assignment will take some time. In addition, in order to ensure the buyer's utilization of the trademark during this period, an attorney of exclusive license on the trademark will also be signed, the period of which is from the date of signing the contract to the completion of the trademark assignment procedures, thus avoiding risks for the buyer.

4.2 Data Source of Empirical Research on Trademark Transaction

It can be seen from an analysis of trademark transaction contracts that transaction price is the most important component. Among the factors affecting the transaction price, the main transaction bodies, trademark name or design, and classification are the three main factors

affecting the trademark transaction price. These three factors can be abstracted as three research variables, namely, trademark transaction subject, trademark distinctiveness, and trademark market demand. The information grasped by different trademark transaction subjects differ. And information asymmetry has a great influence on the bargaining power during the transaction process, eventually affecting the transaction price. As a sign that distinguishes the source of goods or services, trademark distinctiveness is very important and can be regarded as the soul of trademark. Therefore, trademark transaction price increases with the increase of trademark distinctiveness. The classification of trademarks represents different goods or services and is also closely linked with the market demand. It has already been difficult to register in some popular categories, so the transaction price will surely be higher than other categories. Therefore, trademark classification is also an important factor affecting the price of trademark. The following content will be dedicated to analyzing the influences of the three factors on trademark transaction price respectively as well as their combined influences on trademark price.

Econometrics is a branch of economics, which is to reveal the quantitative relationship existing in economic activities. Econometric Views (EViews) is an econometric software for conducting data-based econometric analysis. The empirical study in this chapter aims to verify the influence of various factors on trademark transaction price. And quantification of the degree of influence can be analyzed from the perspective of econometrics. Therefore, econometrical research methods are chosen for the research and the operational software EViews 8.0 is adopted.

The empirical study of trademark transactions is based on the trademark transaction contracts signed on China Trademark Supermarket Website in 2013 and 2014. By sorting out the original contracts, collecting transaction information of 1,009 trademarks, which includes the trademark names or design, trademark classification, the main transaction bodies, trademark purchasing price, and sales price.

As shown in Figure 4-1 (the sale price of trademarks, The X-axis denotes the serial number of trademark transactions, and the Y-axis denotes the trademark sales prices), there are only a few sales prices exceeding RMB 200,000 Yuan. More specifically, as shown in the original data, there are only ten trademarks whose sales prices exceed RMB 200,000 Yuan, less than 1% of the total number of trademark transactions. However, it can be seen from the figure that most of the trademarks were traded at prices below RMB 200,000. The average

transaction price is RMB 40,486 Yuan, far less than the prices of the above ten trademark transactions. Therefore, in order to ensure the rationality and effectiveness of the data analysis, we shall exclude the transaction prices over RMB 200,000 Yuan (including RMB 200,000 Yuan). As a result, there are 999 observations from 2013 to 2014.

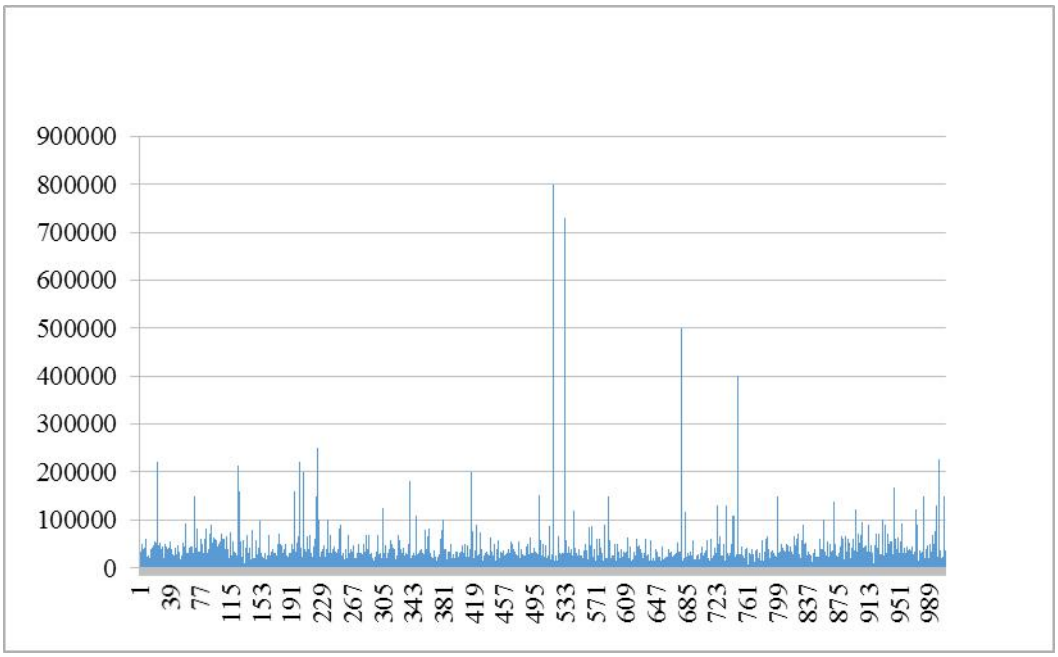


Figure 4-1: The Sales Price of Trademarks (Unit: RMB Yuan)

Source: data from trademark transaction contracts signed on China Trademark Supermarket Website in 2013 and 2014.

Next, I analyze the 999 observations of valid trademark transaction data obtained from the above process. Econometrical methods from the perspective that the factors influence the sales prices in trademark transactions are adopted. First, accoring to the *Paris Convention for the Protection of Industrial Property*, trademark distinctiveness, trademark applicant and trademark classfication are the most important elements of trademark. So I divide these trademarks into three categories according to trademark distinctiveness, transaction subjects, and market demand. Second, I subdivide the three categories of trademarks.

Trademark distinctiveness is decided by the name or design of the trademark itself. It mainly includes three categories: those formed by characters or letters (A_1), those formed by the combination of graphics and characters (A_2), and those formed by the combination of characters and letters (A_3). Trademark transaction subjects include four types: individuals as

trademark buyers (B_1), enterprises as trademark buyers (B_2), individuals as trademark sellers (B_3), and enterprises as trademark sellers (B_4). The market demand of trademark can be divided into low market demand (C_1 represents that trademark transaction volume is less than 10, excluding 10), medium market demand (C_2 represents that trademark transaction volume is between 10 and 30, including 10 but excluding 30), and high market demand (C_3 represents that trademark transaction volume is more than 30, including 10).

In the regression analysis of the explanatory variables, the variables are not only by a clear scale to be quantitative variables, but also by the nature of the variables, such as gender, race, color of skin, nationality. The introduction of this kind of attribute variable regression model is called dummy variable. As the attribute variables usually indicate the existence of quality or attribute, the class attributes variables quantitative method is one of the value to 1 or 0 to represent virtual variables appearing some properties (Shi and Gong, 1998).

Therefore, the trademark distinctiveness, transaction subjects, and market demand are the attribute variables. I use the dummy variable model of econometrics to analyze the factors that influence the prices of trademark transactions. In order to conduct analysis, I establish a dummy variable model, in which Y represents trademark sales price, whereas G represents trademark purchasing price. The dummy variables are characters or letters, graphics and characters, characters and letters; individuals as buyers, enterprises as buyers, individuals as sellers, enterprises as sellers; low demand, medium demand, high demand, the value of these variables is 1 or 0. The structure of the model is shown in Figure 4-2.

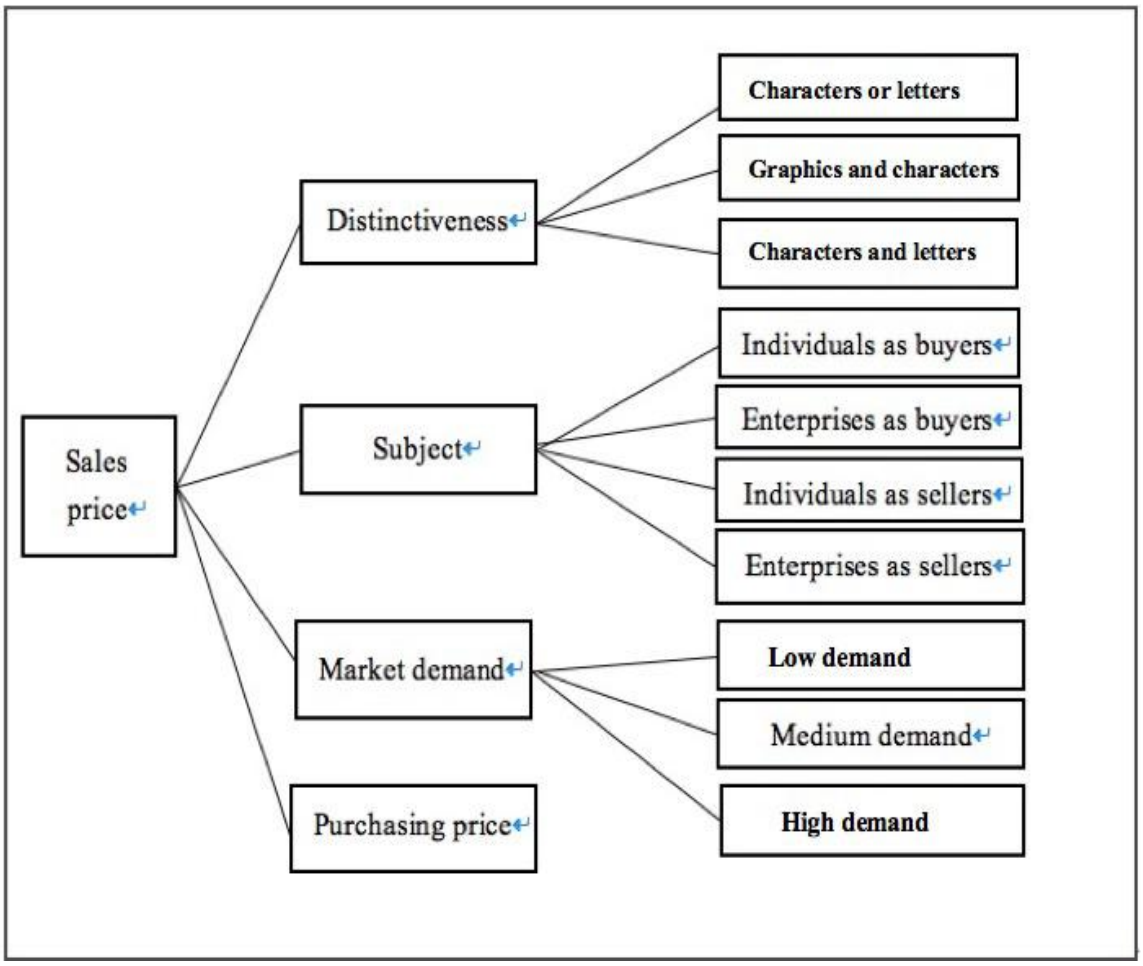


Figure 4-2: Structure of the Dummy Variable Model

Source: This Thesis.

4.3 Influences of Trademark Distinctiveness on Trademark Price

Trademark, as an industrial and commercial mark, is aimed at distinguishing products or services. The distinctiveness of different trademarks can realize this kind of distinction. The distinctiveness is the core value of a trademark. In practice, a trademark is mainly composed of text, graphics, letters, numbers, and only a relatively small portion is composed of three-dimensional symbol, color combination, and sound. Among the collected trademark transaction data, most trademarks are composed of characters, graphics, and letters. Based on the judgment of trademark distinctiveness, the distinctiveness of individual characters or letters is lower, while the combination of characters and graphics is of the highest distinctiveness, because graphics can leave a deep impression on the public and are easier to

distinguish. Therefore, I divide the trademarks into trademarks merely consisting of characters or letters, combination of characters and letters, and combination of graphics and characters. Statistics show that the average transaction price of the three categories of trademarks is RMB 33,658 Yuan, RMB 38,219 Yuan, and RMB 39,302 Yuan respectively. The average transaction price gradually goes higher, initially confirming our subjective judgment.

In the following section, I use dummy variable regression model in econometrics to verify our judgment. First established the dummy variable regression model as formula 4-1.

$$Y_i = \beta_0 + \beta_1 G_i + \beta_2 A_1 G_i + \beta_3 A_2 G_i + \beta_4 A_3 G_i + \mu_i \quad (4\text{-}1)$$

Trademarks consist of characters or letters (indicated by A_1), trademarks consist of graphics and characters combinations (indicated by A_2), and trademarks consist of characters and letters combinations (indicated by A_3). Y represents trademark sales price, G represents trademark purchasing price, and i means the serial number of the trademark.Input all the information of trademark transactions into the EViews 8.0, and draw the conclusion as shown in Figure 4-3.

Equation: UNTITLED Workfile: 商标数据表::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: Y
Method: Least Squares
Date: 11/18/15 Time: 14:43
Sample: 1 3750
Included observations: 3750

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	0.855527	0.012247	69.85574	0.0000
A1G	-0.083401	0.022496	-3.707322	0.0002
A2G	0.115920	0.037071	3.126960	0.0018
A3G	0.064421	0.037974	1.696439	0.0899
C	17898.05	354.4303	50.49808	0.0000

R-squared	0.599824	Mean dependent var	36999.43
Adjusted R-squared	0.599396	S.D. dependent var	23547.96
S.E. of regression	14904.27	Akaike info criterion	22.05802
Sum squared resid	8.32E+11	Schwarz criterion	22.06632
Log likelihood	-41353.78	Hannan-Quinn criter.	22.06097
F-statistic	1403.344	Durbin-Watson stat	1.833673
Prob(F-statistic)	0.000000		

Figure 4-3: The Results of Dummy Variable Analysis

Source: This Thesis.

Based on Figure 4-3, draw the regression equation of trademark distinctiveness as formula 4-2.

$$Y_i = 17898 + 0.86G_i - 0.08A_1G_i + 0.12A_2G_i + 0.06A_3G_i$$

(50.50) (69.90) (-3.71) (3.13) (1.70)

$$\overline{R}^2 = 0.5998 \qquad (4\text{-}2)$$

In the regression equation, the statistics in brackets are the value of t-statistics. From the results of the regression, $\overline{R}^2 = 0.5998$, which shows that the overall fitting effect is well. In addition, p-statistics of each variable under significance tests are less than 0.05, which is of significance and passes the econometric models. From the results of the regression model, I can arrive at the following conclusions:

a. When the trademark is only composed of characters or letters, namely when $A_1 = 1$, $A_2 = 0$, $A_3 = 0$, the sales price of trademark $Y_1 = 17898 + 0.76G$;

b. When the trademark is composed of the combination of graphics and characters, namely $A_1 = 0$, $A_2 = 1$, $A_3 = 0$, the sales price of trademark $Y_2 = 17898 + 0.98G$;

c. When the trademark is composed of the combination characters and letters, namely $A_1 = 0$, $A_2 = 0$, $A_3 = 1$, the sales price of trademark $Y_3 = 17898 + 0.92G$;

From the above results, it can be seen that $Y_2 > Y_3 > Y_1$, which means when other elements are stable, the sales price of graphics and characters combination is the highest, the sales price of the characters and letters combination is the second, and the sales price of purely characters or letters is the lowest. It matches our initial judgment that the trademark sales price is related inherently to the distinctiveness of trademarks. The combination of graphics and characters is easier to identify and memorize, so the sales price is the highest. The characters and letters combination is less easy to identify than the combination of graphics and characters, so the sales price is lower. And the trademark of only characters or letters is of the lowest distinctiveness. Hence it has relatively low sales price.

4.4 The Influence of Transaction Subjects on Trademark Price

The contractual parties are all undergoing a process of price bargaining in which the bargaining power will ultimately affect the transaction price. In economics, the factors that influence the sellers' bargaining power include the number of suppliers with respect to the

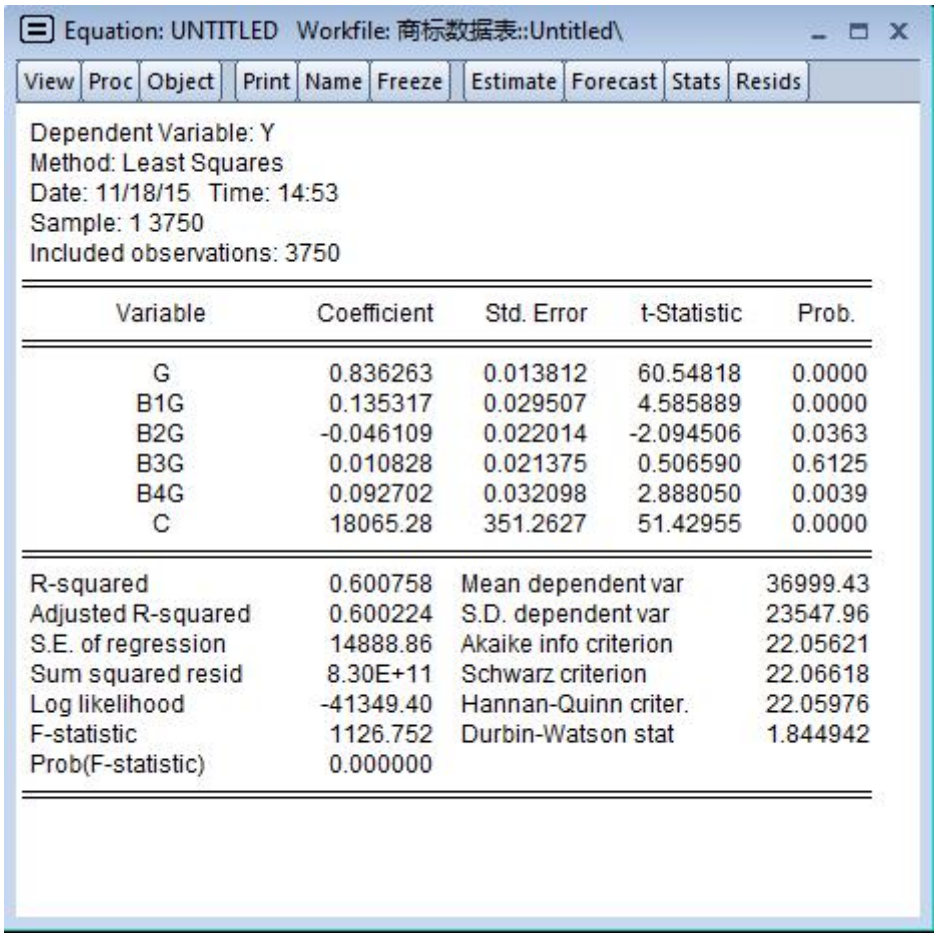
number of buyers, industry centralization of sellers, the quantity of alternative products available for the buyers, the cost of the buyers selecting alternative products, and the information known to the buyers. The factors that influence the buyers' bargaining power include price sensitivity and relative bargaining power. Price sensitivity determines how much the buyer desires to bargain, and relative bargaining power of the buyer determines how much price the buyer can successfully persuade the seller to reduce. In the trademark transaction, the transaction subjects are mainly divided into individuals and enterprises. Therefore, the subjects of trademark transaction can be divided into four types: individuals as buyers, enterprises as sellers, enterprises as buyers, and individuals as sellers. Enterprises have better and clearer understanding of the value of the trademark, and they have more ways to find a similar alternative trademark. As a result, enterprises tend to possess information advantages, which will transform into better bargaining power in trademark transaction. A detailed analysis is provided below.

Therefore, the following dummy variable regression model formula 4-3 can be established, with B_1, B_2, B_3 and B_4 as dummy variables.

$$Y_i = \beta_0 + \beta_1 G_i + \beta_2 B_1 G_i + \beta_3 B_2 G_i + \beta_4 B_3 G_i + \beta_5 B_4 G_i + \mu_i \quad (4\text{-}3)$$

Individuals as buyers (indicated by B_1), enterprises as buyers (indicated by B_2), individuals as sellers (indicated by B_3), and enterprises as sellers (indicated by B_4). Y represents trademark sales price, G represents trademark purchasing price, and i means the serial number of the trademark.

Then, get the regression result shown in Figure 4-4 by EViews 8.0.



Equation: UNTITLED Workfile: 商标数据表::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: Y
Method: Least Squares
Date: 11/18/15 Time: 14:53
Sample: 1 3750
Included observations: 3750

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	0.836263	0.013812	60.54818	0.0000
B1G	0.135317	0.029507	4.585889	0.0000
B2G	-0.046109	0.022014	-2.094506	0.0363
B3G	0.010828	0.021375	0.506590	0.6125
B4G	0.092702	0.032098	2.888050	0.0039
C	18065.28	351.2627	51.42955	0.0000

R-squared	0.600758	Mean dependent var	36999.43
Adjusted R-squared	0.600224	S.D. dependent var	23547.96
S.E. of regression	14888.86	Akaike info criterion	22.05621
Sum squared resid	8.30E+11	Schwarz criterion	22.06618
Log likelihood	-41349.40	Hannan-Quinn criter.	22.05976
F-statistic	1126.752	Durbin-Watson stat	1.844942
Prob(F-statistic)	0.000000		

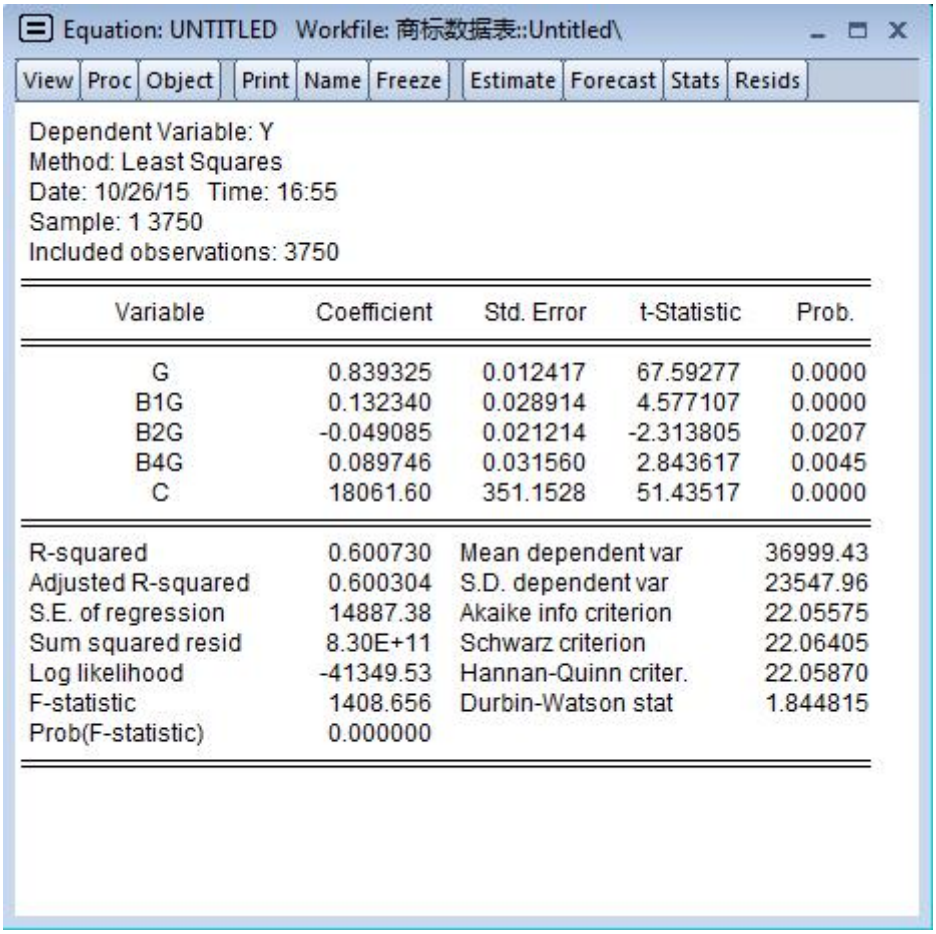
Figure 4-4: The Regression Results of Trademark Transaction Subject Analysis

Source: This Thesis.

The regression results show that the independent variables B_3G are not significant at 5%, 10% significance level. So I consider adding B_3G, or B_3 and B_3G, but the result is still not significant. Therefore, it can be inferred that there is no significant impact on the sales price when the trademark seller is an individual. So I removed the variable B_3G, and re-established the following regression model formula 4-4.

$$Y_i = \beta_0 + \beta_1 G_i + \beta_2 B_1 G_i + \beta_3 B_2 G_i + \beta_5 B_4 G_i + \mu_i \quad (4\text{-}4)$$

The regression result is shown in Figure 4-5.



Equation: UNTITLED Workfile: 商标数据表::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: Y
Method: Least Squares
Date: 10/26/15 Time: 16:55
Sample: 1 3750
Included observations: 3750

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	0.839325	0.012417	67.59277	0.0000
B1G	0.132340	0.028914	4.577107	0.0000
B2G	-0.049085	0.021214	-2.313805	0.0207
B4G	0.089746	0.031560	2.843617	0.0045
C	18061.60	351.1528	51.43517	0.0000

R-squared	0.600730	Mean dependent var	36999.43
Adjusted R-squared	0.600304	S.D. dependent var	23547.96
S.E. of regression	14887.38	Akaike info criterion	22.05575
Sum squared resid	8.30E+11	Schwarz criterion	22.06405
Log likelihood	-41349.53	Hannan-Quinn criter.	22.05870
F-statistic	1408.656	Durbin-Watson stat	1.844815
Prob(F-statistic)	0.000000		

Figure 4-5: The Regression Results of Trademark Transaction Subject Analysis

Source: This Thesis.

The regression equation is shown as formula 4-5.

$$Y_i = 18062 + 0.84G_i + 0.13B_1G_i - 0.05B_2G_i + 0.09B_4G_i$$

(51.44) (67.60) (4.58) (-2.31) (2.84)

$$\overline{R}^2 = 0.6007 \qquad (4\text{-}5)$$

In the equation, the statistics in brackets are the value of t-statistics. From the results of the regression, $\overline{R}^2 = 0.6007$, which means that the overall fitting effect is quite well. In addition, p-statistics of each variable under significance tests are less than 0.05 and are all significant. From this model, get the following conclusions:

a. When the buyer is an individual, namely when $B_1 = 1$, $B_2 = 0$, $B_4 = 0$, the sales price of trademark $Y_1 = 18062 + 0.97G$;

b. When the buyer is an enterprise, namely when $B_1=0$，$B_2=1$，$B_4=0$，the sales price of

trademark Y_2=18062+0.79G；and

c. When the seller is an enterprise, namely when B_1=0，B_2=0，B_4=1，the sales price of trademark Y_3=18062+0.93G.

It can be seen from the above results that Y_1> Y_3> Y_2, which means when other elements are stable and the buyer is an individual rather than an enterprise, the sales prices of trademarks will be higher. This indicates that the bargaining power of enterprise is better than individual, so enterprises can get relative lower price trademark than individuals.

4.5 The Influence of Market Demand on Trademark Price

According to the theory of economics, supply and demand determines the price of goods, which is the same in trademark transactions. Even though trademarks are intangible assets and special commodities, their prices are also determined by supply and demand. Elements with high trademark distinctiveness are limited. It is particularly reflected in trademarks composed of Chinese characters because the number of commonly used Chinese characters is very limited. So the supply of trademarks as a whole is relatively limited. However, the demand of trademarks on certain goods or services is significantly higher, such as Category 25 (clothing, footwear, headgear), and Category 30 (coffee, tea, rice, sugar, etc.). This section analyzes the impact of market demand on trademark prices.

Each registered trademark is specified for particular goods or services. In order to retrieve, review and manage trademarks, trademarks are compiled and divided into 45 categories, which are trademark classifications. The internationally accepted trademark classification is the *Nice Classification* based on *Nice Agreement Concerning the International Classification of Goods and Services for the Purpose of the Registration of Marks*. The current version has been updated to the 10th Edition. *Nice Classification* is arranged by category and divided into 1 to 45 categories, among which 1 to 34 categories are goods, and 35 to 45 categories are services. More than ten thousand goods and services are contained. *Nice classification* is an effective way to distinguish different categories of goods or services. By analyzing the sub-categories and the number of trademark transactions, the transaction of trademarks can be divided into small volume, medium volume, and large volume, which correspond to high market demand, medium market demand, and low market demand of trademarks.

The dummy variable regression model is established as formula 4-6. C_1, C_2 and C_3 are

dummy variables.

$$Y_i = \beta_0 + \beta_1 G_i + \beta_2 C_1 G_i + \beta_3 C_2 G_i + \beta_4 C_3 G_i + \mu_i \quad (4\text{-}6)$$

C_1 indicates the number of trademark transactions in one classification is less than 10 (10 excluded); C_2 indicates the number of trademark transactions in one classification is between 10 and 30 (including 10 but excluding 30); C_3 indicates the number of trademark transactions in one classification is more than 30 (including 30). Y represents trademark sales price, and G represents trademark purchasing price.

By EViews 8.0, get the regression result as shown in Figure 4-6.

Equation: UNTITLED Workfile: 商标数据表::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: Y
Method: Least Squares
Date: 11/18/15 Time: 15:22
Sample: 1 3750
Included observations: 3750

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	0.862516	0.012203	70.68204	0.0000
C1G	0.134826	0.053621	2.514411	0.0120
C2G	-0.176904	0.025217	-7.015266	0.0000
C3G	0.110257	0.024621	4.478257	0.0000
C	17604.20	352.8866	49.88629	0.0000

R-squared	0.605602	Mean dependent var	36999.43
Adjusted R-squared	0.605181	S.D. dependent var	23547.96
S.E. of regression	14796.27	Akaike info criterion	22.04347
Sum squared resid	8.20E+11	Schwarz criterion	22.05178
Log likelihood	-41326.51	Hannan-Quinn criter.	22.04642
F-statistic	1437.623	Durbin-Watson stat	1.828720
Prob(F-statistic)	0.000000		

Figure 4-6: The Regression Result of Trademark Market Demand Analysis

Source: This Thesis.

From Figure 4-6, figure out the regression equation of trademark market demand as formula 4-7.

$$Y_i = 17604 + 0.86G_i + 0.13C_1G_i - 0.18C_2G_i + 0.11C_3G_i$$

(49.89) (70.68) (2.51) (-7.02) (4.48)

$$\overline{R}^2 = 0.6056 \qquad (4\text{-}7)$$

In the regression result, statistics in the brackets are the value of t-statistics. From the results of the regression, $\overline{R}^2 = 0.6056$ in the model, this shows that the overall fitting effect is good. In addition, p-statistics of each variable under significance tests are less than 0.05 and are all significant. From this model, have the following conclusions:

a. When the market demand for trademark transactions is small, that is, when $C_1 = 1$, $C_2 = 0$, $C_3 = 0$, the sales price of the trademark $Y_1 = 17604 + 0.99G$;

b. When the market demand for trademark transactions is medium, that is, when $C_1=0$，$C_2=1$，$C_3=0$, the sales price of the trademark $Y_2=17604+0.68G$；

c. When the market demand for trademark transactions is strong, that is, when $C_1=0$，$C_2=0$, $C_3=1$, the sales price of the trademark $Y_3=17604+0.97G$.

It can be seen from the above results that $Y_1>Y_3>Y_2$, which means that under the condition that other elements are stable, the sales price of trademarks can be the highest when the market demand for trademarks is small, the sales price of trademarks can be lower than the former situation when the market demand for trademarks is large; and the sales price can be the lowest when the market demand for trademarks is medium. However, it is not in line with our expectation that when the market demand is small, the price becomes the highest. The reason may be: (1) data problems. When the market demand is small, the data may not be enough to draw the right conclusion; (2) human factors. There may be too many subjective factors involved when selling trademarks.

4.6 A Comprehensive Study of the Influences of Distinctiveness, Transaction Subjects, and Market Demand on Trademark Price

This section is to analyze the comprehensive impact of trademark subjects, distinctiveness, and market demand on trademark prices. First, establish the following dummy variable regression model as formula 4-8. A_1, A_2, A_3, B_1, B_2, B_3, C_1, C_2, and C_3 are all dummy variables.

$$Y_i = \varphi_0 + \varphi_1 G_i + \delta_1 A_1 + \alpha_1 A_1 G_i + \alpha_2 A_2 G_i + \alpha_3 A_3 G_i + \beta_1 B_1 G_i + \delta_2 B_2 + \beta_2 B_2 G_i + \beta_3 B_3 + \beta_4 B_4 G_i + \gamma_1 C_1 G_i + \gamma_2 C_2 G_i + \gamma_3 C_3 G_i + \mu_i \quad (4\text{-}8)$$

By EViews 8.0, figure out the regression result as shown in Figure 4-7.

Equation: UNTITLED Workfile: 商标数据表::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: Y
Method: Least Squares
Date: 11/18/15 Time: 15:46
Sample: 1 3750
Included observations: 3750

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	0.824808	0.024566	33.57554	0.0000
A1	9266.657	1086.529	8.528680	0.0000
A1G	-0.146477	0.036050	-4.063124	0.0000
A2G	0.254412	0.044805	5.678227	0.0000
A3G	0.235353	0.046744	5.034885	0.0000
B1G	0.245603	0.038096	6.447039	0.0000
B2	5945.332	941.1729	6.316939	0.0000
B2G	-0.075018	0.035879	-2.090881	0.0366
B3	5250.016	935.5359	5.611774	0.0000
B4G	0.225743	0.040886	5.521347	0.0000
C1G	0.295651	0.059581	4.962132	0.0000
C2G	-0.082674	0.034434	-2.400922	0.0164
C3G	0.256892	0.036345	7.068128	0.0000
C	13841.39	510.0900	27.13518	0.0000

R-squared	0.622822	Mean dependent var	36999.43
Adjusted R-squared	0.621510	S.D. dependent var	23547.96
S.E. of regression	14487.07	Akaike info criterion	22.00363
Sum squared resid	7.84E+11	Schwarz criterion	22.02688
Log likelihood	-41242.80	Hannan-Quinn criter.	22.01190
F-statistic	474.5496	Durbin-Watson stat	1.823475
Prob(F-statistic)	0.000000		

Figure 4-7: The Regression Result on Trademark Subjects, Distinctiveness, and Market Demand Analysis

Source: This Thesis.

From Figure 4-7, figure out the regression equation of trademark subjects, distinctiveness, and market demand as formula 4-9.

$$Y_i = 13841 + 0.82G_i + 9267A_1 - 0.15A_1G_i + 0.25A_2G_i + 0.24A_3G_i$$

(27.14) (33.58) (8.53) (-4.06) (5.68) (5.03)

$$+0.25B_1G_i + 5945B_2 - 0.08B_2G_i + 5250B_3 + 0.23B_4G_i$$

(6.45) (6.32) (-2.09) (5.61) (5.52)

$$+0.30C_1G_i - 0.08C_2G_i + 0.26C_3G_i$$

(4.96) (-2.40) (7.07)

$$\overline{R}^2 = 0.6228 \qquad (4\text{-}9)$$

In the regression result, statistics in the brackets are the value of t-statistics. From the results of the regression, $\overline{R}^2 = 0.6228$ in the model, this shows that the overall fitting effect is good. In addition, p-statistics of each variable under significance tests are less than 0.05 and are all significant. From this model, I can arrive at the following conclusions:

a. When the trademark distinctiveness is the only factor considered, that is when A_1=1，A_2=1，A_3=1；B_1=0，B_2=0，B_3=0，B_4=0；C_1=0，C_2=0，C_3=0，the sales price of the trademark is Y_1=23108+1.16G；

b. When the trademark subject is the only factor considered, that is when A_1=0，A_2=0，A_3=0；B_1=1，B_2=1，B_3=1，B_4=1；C_1=0，C_2=0，C_3=0，the sales price of the trademark is Y_2=25036+1.22G；

c. When the market demand is the only factor considered, that is when A_1=0，A_2=0，A_3=0；B_1=0，B_2=0，B_3=0，B_4=0；C_1=1，C_2=1，C_3=1，the sales price of the trademark is Y_3=13841+1.3G.

Now I analyze the influence of the three factors of trademark subjects, distinctiveness, and market demand on trademark price.

If 23108+1.16G=25036+1.22G, then G<0；

If 23108+1.16G=13841+1.3G, then G=66193; and

If 25036+1.22G =13841+1.3G, then G=139938；

So, when 0<G<66193, the trademark subject has the greatest influence on the trademark prices, the distinctiveness is followed, and the trademark demand has the least influence.

When 66193<G<139938, the trademark subject has the greatest influence on the trademark price, the trademark demand is followed, and the distinctiveness has the least

influence.

When 139938<G<200000, trademark demand has the greatest influence on the trademark price, the trademark subject is followed, and the distinctiveness has the least influence.

For the reason that the value of each trademark is less than RMB 200,000 Yuan, conclude the following results:

When 0<G<66193, the trademark subject has the greatest influence on the trademark price, the distinctiveness is followed, and the trademark demand has the least influence.

When 66193<G<139938, the trademark subject has the greatest influence on the trademark prices, the trademark demand is followed, and the distinctiveness has the least influence.

When 139938<G<200000, the trademark demand has the greatest influence on the trademark prices, the transaction subject is followed, and the distinctiveness has the least influence.

When 0<G<66193, the transaction subject accounts for 35.6% of the total area, the trademark distinctiveness accounts for 33.5%, and the market demand accounts for 30.9%, as shown in Figure 4-8.

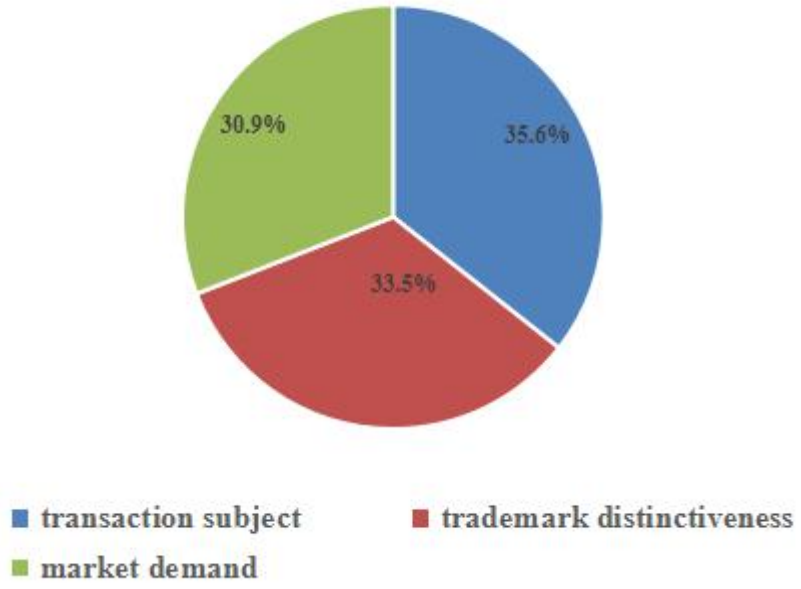


Figure 4-8: Trademark Purchasing Price 0<G<66193 (Unit: Yuan)

Source: This Thesis.

When 66193<G<139938, the transaction subject accounts for 34.2% of the total area, the trademark distinctiveness accounts for 33.5%, and the market demand accounts for 32.3%, as is shown in Figure 4-9.

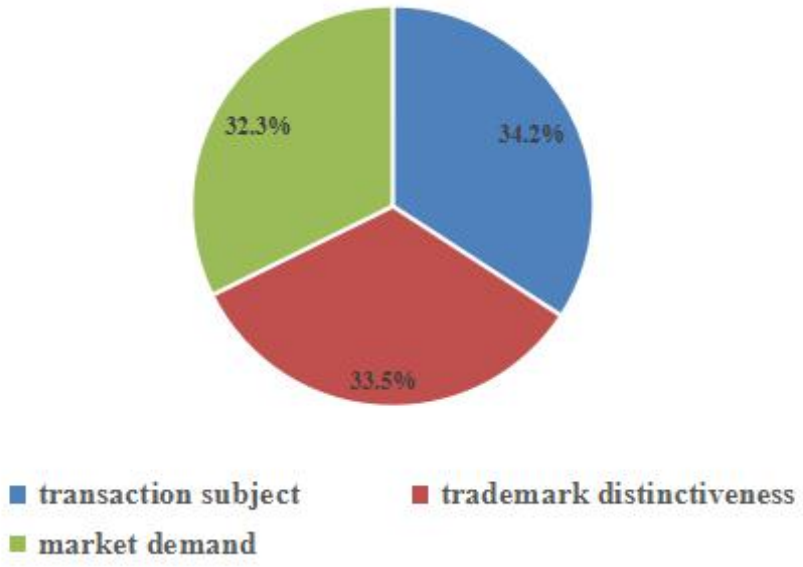


Figure 4-9: Trademark Purchasing Price 66193<G<139938 (Unit: Yuan)

Source: This Thesis.

When 139938<G<200000, the transaction subject accounts for 34.2% of the total area, the trademark distinctiveness accounts for 33.8%, and the market demand accounts for 32.0%, as shown in Figure 4-10.

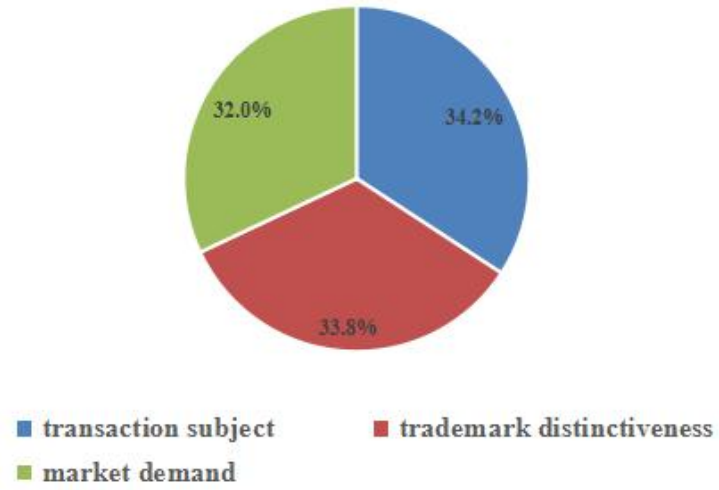


Figure 4-10: Trademark Purchasing Price 139938<G<200000 (Unit: Yuan)

Source: This Thesis.

4.7 Conclusions

This chapter analyzes the influencing factors on trademark price based on the trademark transaction data from China Trademark Supermarket Website in 2013 and 2014. These factors are distinctiveness, trademark subjects, and market demand. When a trademark is easier to identify, the transaction price will be lower, and vice versa. In respect to the trademark transaction subjects, the relative bargaining power of enterprises is greater than that of individuals, thus the purchasing price of enterprises is lower than that of individuals.

It is crucial to maximize the exchange value in IP transaction. Transaction price embodying the exchange value is the equilibrium point for IP buyer and IP seller. Trademark transaction is relatively active in China. This chapter provides a signal for benchmark price of trademark to solve “the dilemma of IP transaction”.

After the empirical study of trademark transactions, chapter 5 switches to case study analysis of patent trading and analyzes the operating means, characteristics, and successful experiences of domestic and overseas patent transaction platforms.

Chapter 5: Case Study of Patent Transaction

Chapter 4 makes empirical study on trademark transaction based on the transaction data from China Trademark Supermarket Website. This chapter researches another important kind of IP, patent. Patent transactions are usually completed informally and privately. Except for transaction data of listed companies, other transaction data are hard to collect. Owing to the scarcity of patent transaction data, it is infeasible to make empirical study of patent transaction. Meanwhile, some patent transaction platforms, either domestic or abroad, seek to probe into transaction models, process, and business expansion options. This chapter intends to carry out case study, compare transaction practices, summarize characteristics and experiences of each platform, then analyze future trends of patent transaction.

5.1 The Current Situation of Patent Transaction

Patents are an important type of IP. Thus, patent transaction is an indispensable part of IP transactions. In fact, patent transaction refers to the assignment of patents between different economic entities with compensation. Patent transactions between countries usually along with the technology transfer from developed countries to developing countries, so they can be a form of technology trade.

According to IP Offerings Patent Value Quotient, AST Research and a number of other authoritative publications, the global patent transaction market is very active, and patents are highly valued. But the global transaction scale has exhibited a trend of considerable decline after 2013 (Song, 2015). He also summarizes the representative cases of U.S. patent transactions, which involve globe famous companies, huge amount and a large number of patents as listed in Table 5-1.

Table 5-1: Representative Cases of Patent Transactions in the U.S.

Transaction Time	Patent Purchaser	Patent Holder	Number of Items	Transaction Amount
July 2011	Apple, Microsoft, RIM, EMC, Ericsson, Sony	Nortel	6,000 patents	U.S. $4.5 billion
August 2011	Google	Motorola	17,000 licensed patents and 7,500 applications	U.S. $12.5 billion
April 2012	Microsoft	AOL	800 patents and applications	U.S. $1.06 billion
July 2012	Intel	InterDigital	1,700 patents	U.S. $375 million
December 2012	Intellectual Ventures, RPX Corporation	Kodak	1,100 patents	U.S. $525 million
September 2013	Microsoft	Nokia	10-year license to all Nokia's patents for utility models; 10-year license to Nokia's trademarks; over 8,500 design patents	U.S. $2.2 billion
June 2015	WiLAN (a Canadian technology development and IP licensing company)	Infineon	7,000 patents and patent applications	U.S. $33 million

Source: the representative cases are from Song (2015).

It can be inferred from the above table that patent transactions abroad are very active. However, patent transactions in China are not so optimistic. According to the statistics of the Science and Technology Development Center of the Ministry of Education (2010), the patent assignment rate in China's universities was generally below 5% in 2010. Meanwhile, Zhang (2013), Deputy Director of China's National Development & Reform Commission, points out at the Annual Conference for China's Economy that only 10% of the inventions can eventually be commercialized.

Statistical data from China Technology Market Management and Promotion Center (2005-2014) website indicate the status of technology transfer in China. Which shows that during the 10-year period from 2005 to 2014, technology transfer contracts accounted for 10,000 items each year, and contract value grew from RMB 36 billion Yuan to RMB 113.7 billion Yuan. Compared with the U.S. patent transaction value, the marketplace is relatively small. The figures are also indicating that technology transfer is still not active enough with

little growth of transferred item quantity each year. Besides, the average single contract value was increasing, which is a sign that technology transfer contracts have been increasingly valuable. The details are in Table 5-2 and Figure 5-1.

Table 5-2: China's Technology Transfer from 2005 to 2014

Year	Number of Transferred Items	Contract Value (RMB 100 million Yuan)
2005	27328	360
2006	11614	321
2007	11474	420
2008	11932	533
2009	13282	539
2010	12377	610
2011	11067	523
2012	11858	1021
2013	11797	1084
2014	12499	1137

Source: data from China Technology Market Management and Promotion Center Website http://www.sinotechmart.cn/chinajishushichangguanli/tjsj/list.shtml.

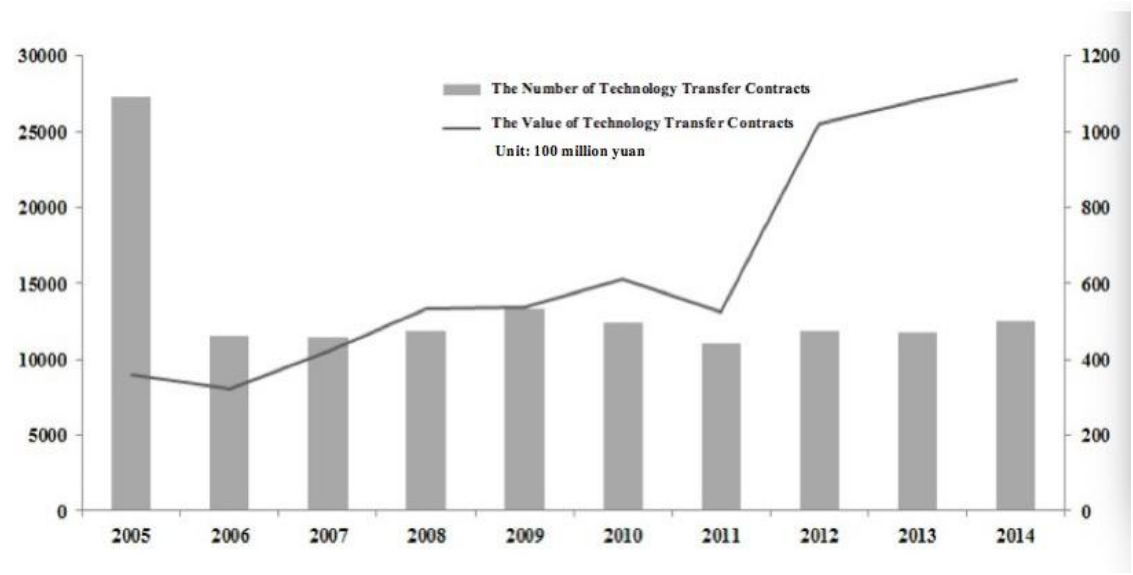


Figure 5-1: China's Technology Transfer Between 2005 and 2014

Source: data from China Technology Market Management and Promotion Center Website http://www.sinotechmart.cn/chinajishushichangguanli/tjsj/list.shtml.

It can be seen that technology transfer in China is still troubled by prominent problems.

The low patent assignment rate is the sore point for China. In order to change the landscape of technology transfer, address the existing problems, remove institutional barriers, and facilitate transfer of technological achievements, China has enacted the *Law of the People's Republic of China on Promoting Technology Transfer*. And the law was amended in 2015, which empowered enterprises to transfer technological achievements. Article 22 of the *Law* stipulates that: enterprises have the right to release information by themselves or entrust technology agencies. In order to collect the technological achievements they need or seek cooperators for the purpose of adopting new technologies, new processes, new materials, or produce new products. This has created a favorable institutional environment for the patent transaction platform and laid a foundation for the development of the patent transaction platform. In February 2016, the State Council issued the *Provisions for Implementation of the Law of the People's Republic of China on Technology Transfer*, providing better policy support for technology transfer.

5.2 Analysis of Domestic Patent Transaction Platforms

Currently, the domestic patent transaction market is scattered, and most of the patent transactions are completed through informal negotiations. At the same time, agency-like patent transaction platforms are growing. Currently, successful platforms are mainly patent transaction or technology transaction platforms sponsored by the government, such as The National Patent Technology Exhibition Center, China Technology Exchange, and Zhejiang Online Technology Market. Besides, market-orientated patent transaction platforms have also gradually made attempts in patent transactions. But the scale is quite small with few transactions. The following section provides an analysis of some domestic representative platforms for patent transaction.

5.2.1 National Patent Technology Exhibition and Exchange Center (Shanghai)

In order to promote patent commercialization, SIPO started to implement the plan of National Patent Technology Exhibition and Transaction Platform in 2006. By the end of 2010, National Patent Technology Exhibition Center had showcased a total of 100,000 items with the actual transaction volume amounting to RMB 8 billion Yuan (Peng, 2011). However, among the 43 transaction platforms, only Beijing and Shanghai have shown active transactions. The others have not made solid breakthroughs in promoting the transaction,

utilization, and commercialization of knowledge products. So I analyze the reasons for the success of Shanghai Center.

In 2006, Shanghai Intellectual Property Service Center was upgraded to National Center for Patent Exhibition and Transaction (Shanghai) by SIPO. In 2014, it was listed into the fifth batch of "National Technology Transfer Model Institutions". Shanghai Center, as a fully government-subsidized public institution, provides services for technology companies, universities, and research institutes to carry out patent commercialization and patent industrialization. Figure 5-2 shows the patent transaction process by Shanghai Center.

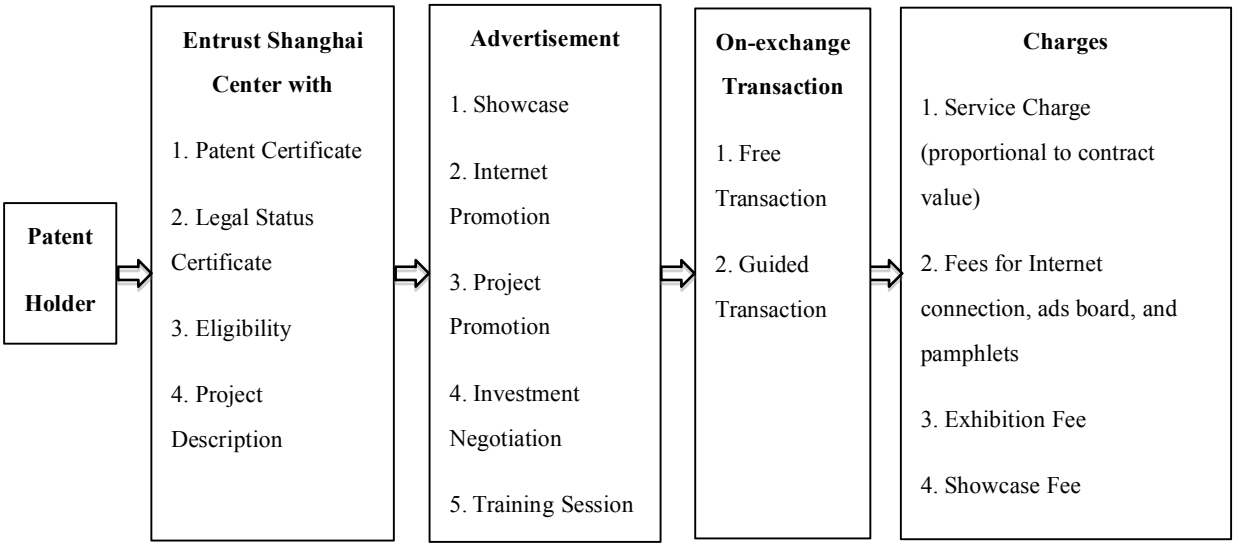


Figure 5-2: Patent Transaction Process of National Center for Patent Exhibition and Transaction (Shanghai)

Source: This Thesis.

Shanghai Center mainly serves patent holders, so the above figure only describes such processes. A patent holder firstly needs to entrust Shanghai Center with his/her patents for transaction. He/she needs to submit *Registration Sheet for Entrusted Transaction* and other necessary documents. After being entrusted, Shanghai center will advertise the patent through a variety of ways, such as showcase, internet promotion, project promotion, etc. Then the patent is held for transaction. Each potential buyer gets a notice of the advertised patent and contacts Shanghai Center, and finally completes on-exchange transaction. Afterwards, Shanghai Center will charge both sides service fees, which account for 4%-5% of the contractual amount. Besides, Shanghai Center also charges fees for internet connection, exhibition, and showcase before the transaction completed.

Besides patent holders, Shanghai Center also offers services to entrepreneurs and investors for patent transactions. In addition, the center also provides other services, such as consultation, legal service, training, and advertisement. Shanghai Center succeeded not only because the government provides capital and human resources, but also because Shanghai, as China's economic center, has a huge demand for patent transactions, in addition to its efforts made to actively broaden business channels. Meanwhile, the center also seeks to expand its business scope to cover consultation and training for upstream clients, and legal service and advertisement service for downstream clients. The center expands its business by stretching patent transaction chain, bringing more clients to the platform. Therefore, stretching business to cover more potential clients is another reason for the success of the platform.

5.2.2 China Technology Exchange

China Technology Exchange was established in 2009 in Beijing. It is also National Patent Technology Exhibition and Exchange Center (Beijing) appointed by SIPO. Since its establishment, the center has launched "the internet platform for technology exchange", "the innovative platform for technological finance", and "the platform for practice of policy implementation". It has organized China's first patent auction and capacity transaction. Patents are the main carriers of technologies, so the center's most transactions rely on patents. Up to now, the center has developed 168 agents and strategic partners and has set up workstations in Guangdong Province, Fujian Province, and Jiangsu Province. It also established partnerships with overseas institutions including WIPO and Singapore Technology Exchange, fabricating a primary network. By the end of 2014, posted transfer intentions had totaled over 68,000 items, amounting to RMB 98.5 billion Yuan; a total of 9,816 projects had been agreed upon with a total amount of RMB 49.13 billion Yuan (China Technology Exchange, 2016).

China Technology Exchange focuses on services related to technology transaction and commercialization of technological achievements. The services can be divided into three categories and 11 items, covering transaction services, financing services, and supporting services, among which, technology transaction is the priority of the current business. Technology transaction involves the license and transfer of technological achievements, patents, and trademarks. It also covers the promotion and commercialization of generic technologies and overall industrialization of mature technical projects. Currently, mature

technology transaction service products of China Technology Exchange include bidding, showcases, roadshows, and orientated project negotiations. In December 2014, the internet platform (www.ctex.cn) established by China Technology Exchange started its online operation. The website is innovative in application and technologies. What is worth mentioning most is that it also launches innovative services such as online bidding, online roadshow, online exhibition, and customized services.

By analyzing the operation of China Technology Exchange, the following tips for success are inferred:

a. E-commerce reliance. With the burgeoning internet technologies, buyers and sellers are able to reach deals online without meeting each other, eliminating the constraints of geological distance and reducing costs for search and communication. The introduction of e-commerce facilitates transaction of IP, which is a form of intangible products, and also promotes deals by mediating between buyers and sellers.

b. IP One-Stop Service. China Technology Exchange combines dozens of member institutions to construct a one-stop platform Intellectual Property One-stop Service (IPOS), which started operation in 2010. IPOS integrates first-rate agent resources and covers IP related services, such as consultancy, indexing, legal affairs, evaluation, and training, so as to facilitate patent commercialization. IPOS launches ten sub-platforms including evaluation, consultancy, legal service, training program, index service, customized data package, international business, forums & salons, industry news, and commercialization of IP. By relying on IPOS, China Technology Exchange is able to provide customers with the most comprehensive services, draws most attention by IP users, enhances the reputation of the platform, and gathers human resources. In addition, these services would help facilitate agreements and deals between buyers and sellers. For instance, IP evaluation and consultation increase users' knowledge of patent value, but legal service ensures stability of patents and avoids risks.

c. Integration of online and offline services. Patent is intangible and lacks direct visibility. Meanwhile, it's only a type of technology and needs to be combined with other conditions to commercialize. Therefore, it is very important to communicate the details about patent. China Technology Exchange regularly posts schedules online for special technology transaction offline, so as to draw the attention of

corporation owners, patent holders, and patent seekers. Such link between online and offline can promote patent transaction by offering the opportunity to have in-depth communication and exchange.

d. Multiple ways of transaction. Traditional transaction model mainly refers to negotiation, auction, tendering and bidding. China Technology Exchange seeks different ways to complete transaction by comparing different means of transaction. In December 2010, the center initiated patent auction, which is a new way of patent transaction. After fierce bidding, 28 items patented by Computing Technology Institute of China Academy of Science were auctioned off, realizing an amount of nearly RMB 3 million Yuan (Fang et al., 2012).

5.2.3 China Zhejiang Online Technology Market

China Zhejiang Online Technology Market (www.51jishu.com) is an innovative integration of information technology system within traditional tangible markets. It was established in 2002 in Hangzhou, relies on the Internet to link 11 municipal markets, 90 county-level markets, thousands of corporations in Zhejiang Province, and thousands of universities, research institutes, venture capitals, and technology brokers in Zhejiang and other provinces. It is equipped with a series of platforms dealing with information, transactions, services, and management. As one of the most economically prosperous regions in China, technology transaction in Zhejiang has been active for a long time. China Zhejiang Online Technology Market has made outstanding achievements through the construction of online transaction platforms which integrates patent transaction as an essential part.

China Zhejiang Online Technology Market currently serves in biddings, online stores, inventions, demands, evaluations, news, and contract registration with its multi-level markets. Users can post transfer or license intentions online, submit demands, and participate in biddings and evaluations. Main carriers for transactions are special issues, including agreements and auctions. In addition, it also offers derivatives, such as technology assessment and contract registration. Since its establishment, it has witnessed the participation of universities, research institutes, agencies, and technicians. By the end of 2015, the online market had a total of 97,258 company visits, released a total of 78,614 technological issues, and generated 158,766 inventions. Besides, it had signed 36,479 agreements that amounted to RMB 36.213 billion Yuan, constituting a sizable market for technology (China Zhejiang

Online Technology Market, 2016).

China Zhejiang Online Technology Market accords well with China's current economic condition. It also adopts the latest management model in market exploration and management, and has initially formed the distinctive "Zhejiang Model".

a. Technology demand-driven. Traditionally, technology transaction mainly relies on suppliers such as enterprises, universities, and research institutes that put their patents on platforms and wait for them to be purchased. It is a passive model of transaction and will result in sluggish business and delays in patent assignment. In comparison, the pull from technology demand can enable corporations to post their technical issues and bids. On the other hand, universities and research institutes carry out R&D to become the researcher. For any patent approved, universities and institutions act as the seller, and corporations as the buyer. Patent transactions can finally be concluded through the online technology market.

b. Non-profit model with government subsidies. Zhejiang Online Technology Market is a non-profit entity sponsored by the government. Municipal and county governments wage the construction of facilities and information system, and pay for software development. They do not charge users for online use or transaction, so the model greatly reduces transaction cost. In addition, the market also charges zero on users for registration or negotiation. All parties are attracted to take active part in markets.

c. Construct the sub-markets. Technology market can be divided into a number of sub-markets to meet different demands. Each sub-market will correspond well with demand and draw the attention of particular corporations and experts. The sub-markets might also associate issues with products to broaden and deepen market services.

d. Enhance agency services. Agencies are important to patent transaction. Zhejiang Online Technology Market is cooperating with research institutes all over the country and has established an agency confederation containing 162 member institutions. Powerful agency services can provide intelligence support to solve technical issues and invigorate market activities.

5.3 Patent Transaction Platforms Abroad

Compared with the initial exploration of patent transaction in China, patent transaction abroad is quite common and mature, with a number of transaction platforms that cover assignment and license of patents and the invention of new operation approaches. In developed countries especially the U.S., patent operation has formed a complete industrial chain, and patent transaction has been put into practice that has led to the quest for new business models. A number of companies dealing with patent transaction have appeared, three of which are introduced.

5.3.1 Ocean Tomo

Ocean Tomo was founded in 2003 in Chicago. A globally leading smart capital merchant bank provides financial products and services including expert testimony, valuation, investment, risk management, and transaction of IP. In April 2006, Ocean Tomo organized a patent auction in San Francisco, drawing a lot of public attention. Patent auction has currently become a choice for technology transaction. Subsequently, other countries and regions including Europe, Japan, and India also began to try patent auction. Currently, Ocean Tomo holds two auctions each year in the U.S., with the auction value amounting to an average of $10 million each.

Ocean Tomo has been dealing with IP auctions for ten years. Such model has been proved effective because of its tough and comprehensive standards for auction and its promotion prior to auction. The company relies on an exclusive rating system to screen the patent profiles submitted by dealers. The selected patents will be evaluated by an expert team, which includes technical and law professionals and is able to carry out technical analysis and judge whether to put them on auction. Meanwhile, bidders need to register in advance, pay for registration, and submit qualifications for bidding. The reviewed profiles of IP and bidders will then be registered in database. Ocean Tomo would also carry out due diligence before auction show, which would continue for days to allow communication between professionals.

The success of Ocean Tomo's patent auction can be attributed to the following facts (Liu and Fang, 2012; Wang, 2014):

a. All patents submitted by sellers for auction are screened by the company, and evaluated by expert teams only if they meet the preliminary requirements. Relevant

information about technology and patents is analyzed, before the comprehensive judgement on whether the patent is suitable for auction is made;

b. Bidders are required to register, pay for bidding, and submit bidder's qualifications, so that potential buyers are verified and biddings are guaranteed;

c. Auctions are organized as shows to allow for sufficient communication between sellers and bidders to promote understanding;

d. Advertisement campaigns are launched prior to each auction. Ocean Tomo relies on TV program, newspapers, and the internet to advertise the auction and draws the attention of a large number of potential traders.

5.3.2 Intellectual Ventures

Intellectual Ventures (IV) was founded in 2000, IV's headquarter is in Washington, U.S. Since 2003, the company has been dealing with investments on inventions or related businesses, and has set up an invention laboratory in its headquarter. In May 2009, the company started to operate its IV Invention laboratory officially. The company's main investments cover information technology, biomedicine, and material science. Currently, IV owns 30,000 patents. It aims to pursue technological progress over the next five to ten years and to provide inventors with financial and technical supports, thereby commercializing innovations and academic achievements.

Initially, IV only launched a "Patent Defense Fund", and its investors only aimed to construct a patent defense system. As more and more inventors joined in and the company accumulated a growing number of patents, huge profitability of patents quickly switched investment from traditional products and technologies. An increasing number of investors joined in the pursuit of such high profits. A growing portion of investors began to treat patents as a new type of financial product to avoid low efficiency. Since then, the main business of IV prospered. The company was expanded into China in 2008 and has been in cooperation with a dozen China's universities. Usually, IV does not directly buy patents, but invests in promising concepts, assists inventors to develop patents based on its financial capacity and professional operation, and shares the profits gained from patent commercialization.

IV's patent operations can be divided into four types: investment, licensing, assignment, and litigation. The operator will take into account patentability, innovativeness, time needed

for commercialization, available documents and technologies, and possibility of being accepted by the market. It may commercialize inventions by licensing or forming a new company, joint venture or partnership. A lot of patents, either registered by individuals or by companies, have been ignored because of lack of licensing channels. IV owns a bountiful of transfer channels that enable patents to be adopted and commercialized within the shortest time. With such advantages, IV can act as a broker.

Each year's ranking list of patent registration would include business giants, and only 1/3 of whose patents were developed independently while the rest 2/3 had been acquired by licensing, purchasing, or assignment. Obviously, a company needs to utilize more patents to maintain its key competence. However, it is not possible or necessary for a company to build a "super research team" that is able to deal with all inventions. A patent involves long development cycle, high research costs, and huge risks. Many inventions miss the best timing for commercializing. IV attempts to broker between inventors and corporations, facilitate patent transaction, and serve for patent holders and seekers.

It can infer from the case of IV that a patent operation fund sponsored by the government would aid in development and commercialization of patents. Such fund requires huge financial capacity for a wide range of purchases in a variety of industries. The fund does not have to set up exclusive research centers, but needs to integrate science institutions and corporate researchers to entrust shared patents. Meanwhile, the fund also needs to build a huge market for patent employment so that many unemployed patents can have access to the market. As operators of patent funds, transaction platforms are able to access core patents and integrate them into the platforms, forming the base for long-term operation of patent funds and future transactions.

5.3.3 Intellectual Property Exchange International

Intellectual Property Exchange International (IPXI) was founded in 2011 in Chicago in the U.S. It is the world's first exchange aimed at non-exclusive licensing and transaction of IP through market pricing and standardized terms. A number of renowned corporations, universities, and laboratories give assistance in its foundation. Among them, its co-founders are six universities, three laboratories, and nine companies. There are some common problems in current markets for non-exclusive transaction of patents. To be specific, market data are fragmented and insufficient, patent holders usually decide transaction prices, and none of the

transaction terms are standardized. As a transaction is time-consuming and costly, IPXI attempts to standardize it so that both the buyer and the seller have the chance to pinpoint the reasonable price. It can create a fair condition for transaction, promote market efficiency.

IPXI adopts a series of measures to add to transparency of transactions. It relies on legal analysis for the market to accept patent as Unit License Rights (ULR). IPXI would carry out quality analysis to ensure potential purchasers. The results of the analysis will be accessible to potential buyers. Meanwhile, it also attempts to standardize transaction terms so that sales terms are also accessible to potential buyers. In addition, buyers at ULR are required to submit reports regularly, informing IPXI and other members of patent status. The information combined with ULR prices is key indicators of acceptance by markets and will constitute a base for better decision to develop and manage IP for business leaders. In addition, pricing is also transparent. Authorized participants have access to IPXI's transaction platform and get the latest prices.

In order to increase transaction efficiency, IPXI provides a platform for patent transaction based on standardized terms. Companies can get access to patents offered for sale by IPXI, and choose to buy ULRs at the minimum of legal and transaction costs to reach their business goals. Meanwhile, small companies or individual IP owners may entrust the platform with the whole process including the marketing, audit, and law enforcement for a ULR. Fully authorized to conduct due diligence, IPXI can rely on its ULR model to identify, evaluate, analyze, and audit high quality transactions.

IPXI brings a win-win situation for both parties of the transaction. IP owners would benefit from cost reduction and be able to avoid overlaid licensing. Meanwhile, licensees will be able to get a patent package at a reasonable price and pay for the patent based on usage instead of not considering usage. The licensee can sell URL to a third party when they no longer need it. In addition, the licensees will transact under a fair condition and justifiable terms. Most importantly, patents submitted to this platform for transaction will all undergo due diligence conducted by this platform to eliminate the legal risks involved. The platform will also carry out analysis of the technical advantages, market prospects and issue corresponding reports for the reference of the licensees.

Despite all these advantages, in March 2015, IPXI announced its decision to close its business as it had not been able to acquire sufficient patent licenses to support its operation. It failed to create enough licenses and its operation was stagnant due to the lack of business

drives. IPXI's failure can be attributed to two factors: firstly, it had been in a seller's market and was forced to actively seek buyers. In fact, the buyer's demand is more important in IP market. Secondly, few patents had been developed and the patent resources available for licensing was very limited. So it is impossible to lead more companies to care, understand and join in transactions. Buyer, seller and IP are three elements for a transaction platform, among which, IP is the key factor in attraction of more buyers and sellers. Meanwhile, innovative transaction relies on the development of IP markets, which are not mature enough for IPXI to develop. Potential buyers would prefer to seek solutions by waiting for the expiration of patents or resorting to litigation. Under such circumstance, new transaction patterns are hard to be accepted by the market.

5.4 A Comparison of Domestic and Overseas Platforms

Based on the research into the domestic and overseas patent transaction platforms, I can infer the differences, advantages, and disadvantages, namely, their main characteristics. The following comparison in Table 5-3 attempts to help better understand these platforms. From the table, it is obvious that the success of domestic and overseas patent transaction platforms is quite different. The biggest difference is that domestic platforms mainly rely on government support, while overseas platforms rely on market operation. Meanwhile, a successful platform must have one or more key service(s), such as patent-related services, IPOS, demand side pull, patent auction, patent operation and ULR. Because the key services mean solutions to commercialize the patents. As China's patent marketplace is still under rapid development, the most suitable model is also in exploration. The summaries of different platforms are crucial to patent transactions.

Table 5-3: The Comparison Table for Domestic and Overseas Patent Transaction Platforms

Name	Establishment Time and Location	Main Characteristics
National Patent Technology Exhibition and Exchange Center (Shanghai)	2006, Shanghai	patent commercialization platform, geographical advantage, patent-related services, government support, expansion of business scope
China Technology Exchange	2009, Beijing	e-commerce, IPOS, integration of online and offline services, multiple ways of transaction
China Zhejiang Online Technology Market	2002, Hangzhou	demand side pull, non-profit business model with government subsidies, sub-markets, quality service
Ocean Tomo	2003, Chicago	patent auction, due diligence for patent, qualification for bidders, sufficient communication, advertisement
Intellectual Ventures	2000, Washington	patent operation, commercialize inventions, a bountiful of transfer channels
Intellectual Property Exchange International	2011, Chicago	non-exclusive licensing, market pricing, standard terms, corporations, universities and labs support, ULR

Source: This Thesis.

5.5 Conclusions

This chapter analyzes the operations and characteristics of three domestic and three overseas patent platforms. Domestic transaction platforms, mainly guided by the government policy rather than the market spontaneous developments, post demands and connect buyers and sellers to promote transactions. Compared with domestic platforms, overseas platforms are not only providing patent assignment and license, but also seeking new transaction patterns.

Actually, these patent transaction platforms act as the IP transaction intermediaries. Their successes indicate that they have solved “the dilemma of IP transaction” more or less. The effects of these platforms not only lower the transaction costs by a variety of innovative means, but also attract more IP participants by their popularity. More IP participants lead more

transaction bids to maximize the exchange value of patent. These explorations solving “the dilemma of IP transaction” provide inspirations for optimizing the IP transaction mechanisms in the future.

Chapter 6 introduces O3 IP transaction mechanisms developed by CIPRUN. Meanwhile, policies should be adjusted to promote the IP transaction.

Chapter 6: The O3 IP Transaction Mechanisms and Policy Suggestions

Based on the empirical research of trademark transaction in Chapter 4 and the case study of patent transaction in Chapter 5, I should explore the new IP transaction mechanisms to improve the efficiency and reduce the cost of IP transaction. CIPRUN summarizes the successful experience in trademark transaction, and in combination with the current Online-to-Offline (O2O) business models, proposes O3 IP mechanisms to solve the existing problems in IP transaction. Meanwhile, the IP transaction policies need to be adjusted to adapt to the current situation. This chapter introduces O3 IP mechanisms and puts forward policy suggestions.

6.1 The Proposal of O3 IP Transaction Mechanisms

China Internet Network Information Center (2016) reveals that as of December 2015, the number of Chinese netizens had reached 688 million, and China's Internet penetration rate was 50.3%. With the popularization of the Internet, the public has gradually accepted e-commerce, and many new e-commerce transaction models are also emerging. With the development of e-commerce, O2O emerged. This mode connects the offline business opportunities with the Internet, makes the Internet be the front counter of offline trade. Offline services can attract customers online and the customers can screen the services online (Du and Tang, 2014). O2O is a new business model that gets popularity in recent years, which combines the online Internet with the offline deal. O2O usually refers to the e-commerce platforms publishing the shops' promotion, location, and contact information to the e-commerce platforms, and pushing all the information to the online e-commerce users. When the online users access the business information, they will complete their orders and payment process offline, and enjoy their orders by showing the payment vouchers. Throughout the whole consumption process, the e-commerce platforms achieve their information flow and cash flow online, and their logistics and business flow offline, thus enhancing the consumer experience and making transactions more convenient. The core idea of O2O is to lead the

online users to the shops in real entity, provide quality services through the online payment, provide real-time statistical data to the shops, and push the businesses' product information accurately to the consumers. This model is the best way for the service-based products, especially experience-based products, and it is quite different from the traditional concept of e-commerce (Ma, 2012). Owing to the great advantages of O2O in service consumption, many e-commerce websites have gained huge success, especially the coupon website such as the dianping.com, meituan.com, and 55tuan.com. Statistics from Qianzhan Industry Research Institute (2015) indicate that in the first half of 2015, the O2O market size reached RMB 304.94 billion Yuan. Meanwhile, the State Council (2015b: 22) also points out that "*The online and offline interactions are of great importance to promoting the transformation of the brick-and-mortar stores and innovation of business model, enhancing the new economic development driving force, and serving the public entrepreneurship and innovation. In a word, the combination of online and offline model has bright prospects in the future*."

The object of IP transaction is unique, and the entire process involves several aspects. Meanwhile, e-commerce can greatly reduce the information cost and contract cost of IP transactions, thus ultimately improve IP transaction efficiency. As a result, IP e-commerce has great prospects, and the exact model of which requires in-depth analysis. The requirements of the object of IP transaction are usually determined by the buyers, such as the types of IP, the characteristics of IP, the related products or services, and the price range, etc. However, the existing IP cannot fully meet all the requirements of the buyers, so they have to make comprehensive trade-off in terms of price and personal preference, and consult transaction platforms about the problems in transactions. IP transaction is different from the traditional commodity trading, because the buyers usually have a relatively limited understanding of IP, and the whole process often takes a long time before the official formalities are completed. In this process, the timely and professional responses of platforms to the customers are especially critical, which cannot realize thoroughly online.

Based on the popularity and development of the Internet, the particularity of IP transaction, the success of O2O, as well as the huge success of China Trademark Supermarket Website in trademark transaction, CIPRUN first proposed the O3 IP transaction mechanisms. O3 originates from O2O, which refers to Online to Offline to Online. The buyers of IP will communicate with the transaction platform from online to offline, and ultimately complete the process of IP transaction. O3 IP transaction mechanisms not only refer to the online to offline

and then back to online, but can also maximize the efficiency of the entire transaction by completing the standardized sections online. Therefore, O3 refers to the multiple online and offline switching until the completion of IP transaction. In this process, the standardized process of access to information, contracts, and order payment are completed online. The non-standardized sections of communication in detail, problem consultation and procedures are completed offline. Taking advantage of the fast and convenient online processing and the quick offline response, the transaction efficiency can be improved, and the experience can also be enhanced. Traditional IP transaction is generally carried out offline, and now some IP platforms have made Internet-based e-commerce attempts, but the integration of IP transaction with the Internet is still not deep enough, just staying at the level of IP information publication. As a result, the O3 model proposed by CIPRUN tries to sort out the transaction processes, and completes all the standardized processes online. Thus the O3 will enhance the efficiency of IP transaction, and it is a major innovation of IP transaction, which will profoundly affect the development of the IP market.

6.2 Comparative Analysis of O3 and Other E-commerce Models

E-commerce refers to the business activities carried out on internet, which can be traced back to the 1960s when internet came into being in the U.S. Its rapid development began in the 1990s. At present, the development of e-commerce has become mature. China E-commerce Research Center (2015) indicates that China's total e-commerce transactions amounted to RMB 18.3 trillion Yuan in 2015, and reached an increase of 36.5% compared with 2014. Thus, e-commerce is already a huge market with high public acceptance. Based on the classification of the e-commerce consumers, the e-commerce model can be divided into B2B, B2C and C2C. This section is focused on the comparison of O3 and these models.

B2B (Business-to-Business) refers to the online business activities between enterprises. It is the oldest and the developed business model. B2B reduces the charges of business activities between enterprises through relatively low information cost while integrating the supply chain and value chain of enterprises. The integration mainly reflects in procurement cost and inventory cost reduction, turnaround time saving and market opportunity expansion, etc., thus ultimately bringing great convenience and driving the enterprise' development. B2B business model can be divided into vertical B2B of upstream and downstream industry, horizontal B2B of similar industries, and self-built B2B by industry leaders. Currently,

e-commerce activities between enterprises have become a major component of e-commerce in China, forming several well-known third-party B2B platforms, such as Alibaba and HC360.com.

B2C (Business-to-Customer) refers to the business model where enterprises directly sell products or provide services to consumers via internet. B2C is mainly web-based retailing carried out via internet. It provides consumers with a convenient online shopping environment, and consumers have an excellent understanding and experience of products as well as online payment experience by means of internet and multimedia technology. Meanwhile, through direct contact with end consumers, enterprises do not need to pay intermediate agency costs, thus making their product prices more competitive. Moreover, by analyzing the consumer data, they will also be able to develop products or services that better meet the demand of consumers, thus adding vigor and vitality to their development. Currently, B2C market has matured mainly in the comprehensive or specialized shopping malls built by the third-party platforms, such as T-mall and JD.COM. In 2013, T-mall, China's largest B2C platform, accounted for 57.4% of the market, followed by JD.COM which accounted for 21% of the market, and Sunin taking the third place (Zhou and Fu, 2014). The United Nations Conference on Trade and Development (2015) points out that among the 130 global economies, China has actually become the world's largest B2C market.

C2C (Customer-to-Customer) is an Internet trading behavior between consumers on goods or services. It is quite similar to the traditional secondary market with more advantages. The advantages lie in the following aspects. First, lower transaction cost. C2C uses internet to lower the costs of a variety of transactions and information and speed up the transaction process. Second, convenient information search. Taking advantage of computer in information processing and searching, C2C enables consumers to find the products or services quickly they wish to buy. Third, diverse choices of products or services. In C2C model, ordinary consumers provide products or services. The choices of products and services provided by many consumers may even be more than those provided by enterprises. Thus, consumers will have more choices and find it easier to have their diversified and individualized needs met. At present, Taobao and paipai.com are China's typical C2C platforms and Taobao accounts for more than half of the market.

B2B, B2C and C2C are mainly for the consumption of standardized products. Consumers complete the selection of goods, order generation, and online payment and. Then they will

receive the goods they choose through the logistics system and complete the transaction. The three models have achieved great success in China, there have several world-class e-commerce enterprises such as Alibaba, JD.COM and VIP.com. They have been successfully listed in stock exchange of the U.S. Yet three kinds of e-commerce models cannot meet the consumers' demands, hence the O2O model combining online and offline. Based on the analysis, the comparison of O3 and B2B, B2C, C2C, O2O are concluded in Table 6-1.

Table 6-1: Comparisons of O3 and B2B, B2C, C2C, O2O

Name	**Content**	**Advantages**	**Disadvantages**	**Way to Profit**	**Cases**
B2B	Business-to- Business	procurement cost and inventory cost reduction, and turnaround time saving	transaction risk and price competition	membership fee, advertising fee, and PPC fee	Alibaba and HC.com
B2C	Business-to-Customer	product quality assurance, and after-sales services	lack of product diversity, low interaction of buyers and sellers, and small bargain space	membership fee, service fee, and sales charges	JD.com and T-mall
C2C	Customer -to-Customer	rich category, a high level of interaction between buyers and sellers, and abundant room for bargaining	no guarantee of product quality, and transaction integrity issue	membership fee, advertising fee, and PPC fee	Taobao and paipai.com
O2O	Combination of online and offline	consumer experience-oriented, full utilization of offline resources, and easy to get statistics of consumer behavior	hard to guarantee the quality of offline services; and transaction integrity issues of offline businesses	membership fee, advertising cost, and promotion cost	Meituan.com and Uber
O3	Multiple integration of online and offline	standardized online processes, interactive transaction, and high efficiency	repeated switch from online to offline will undermine customer experience	advertising fee, promotion fee, and transaction fee	CIPRUN

Source: This Thesis.

6.3 The Design of O3 IP Transaction Mechanisms

Among all the IP transactions, IP negotiation transaction is quite common. In this traction pattern, the transaction platform collects, summarizes, organizes all types of IPs that the IP holders want to sell through multiple channels, and builds the IP transaction database. IP buyers leave messages about their desired IP on platform websites or APPs. Then IP transaction advisers contact the buyers offline to confirm their specific needs, search qualified IPs in the database, and contact the sellers. After the final negotiation on price and payment, transactions are completed. The transactions vary since the demands of buyers and the objects are particular. As a result, the transaction process of IP cannot be standardized, so the vast majority of processes of IP transaction on platforms are completed offline. With the summary of China Trademark Supermarket Website's successful experience in trademark transaction, the analysis and comparison on advantages and disadvantages of various models of e-commerce, together with the characteristics of IP transaction as well as the O2O e-commerce model, CIPRUN first proposed and implemented the O3 e-commerce model of IP transaction. O3 does not reconstruct the e-commerce model of IP transaction, but standardizes all the transaction processes, and conducts all the standardized processes online. O3 can optimize the transaction processes, improve productivity, enhance the customer experience, and ultimately reduce transaction cost, improve efficiency, and innovate the IP transaction mechanisms.

Based on the characteristics of e-commerce and IP transaction, CIPRUN divides the IP transaction into the following ten processes. They are the buyer accessing the platform, creating an order, communicating with the buyer, communicating with the seller, the buyer confirming the purchasing order, online payment, the seller confirming assignment order, order execution, official announcement, and rating and sharing. In these processes, the buyer accessing the platform, creating an order, the buyer confirming the purchasing order, order payment and rating, and sharing are conducted online. And communicating with the buyer, communicating with the seller, the seller's confirmation of assignment order, order execution, and official announcement are completed offline. In addition, the large database for IP transaction can help find the qualified IP for customers quickly. The establishment of a real-time order tracking system will enable the buyers to acknowledge the status of the orders and enhance the customer experience. Through the re-creation of the process, online and offline can be combined to ultimately take advantages of online processes. It can improve

operational efficiency, and enhance the user experience. The detailed O3 IP transaction processes are given in Table 6-2.

Table 6-2: O3 IP Transaction Processes

Transaction process descriptions	**Online**	**Offline**
Buyer accessing the platform	X	
Creating an order	X	
Communicating with the buyer		X
Communicating with the seller		X
Buyer confirming the purchasing order	X	
Online payment	X	
Seller confirming assignment order	X	
Order execution		X
Official announcement		X
Rating and sharing	X	

Source: This Thesis.

(1) Buyer accessing the platform. It is the initial link of O3 IP transaction mechanisms. Based on the reputation and scale effect of China Trademark Supermarket Website, CIPRUN expands IP transactions to patents and copyrights, and establishes a huge database for IP transactions. Customers access the platform via the websites and APP. After registration, the subsequent IP transactions can be continued.

(2) Creating an order. After the buyer's registration, he/she can create an IP transaction order online or leave messages (the IP transaction consultant will help create the order later). It will generate a unique order number (by the order number, the whole processes of the transaction can be traced). Then the buyer may describe his/her demands on IP. For example,

if the buyer wants to buy a trademark, he/she shall describe the trademark classification, standard sample, price range, and registration time.

(3) Communicating with the buyer. After the order created or the messages left by intended buyer, IP transaction consultant will contact the buyer according to the registered information in time to confirm the demand and complement the related information. Then the consultant will help the buyer to create an IP transaction order based on the content of the communication. After the order created, the consultant will search and select the qualified IP in accordance with the demands of the buyer in database. While communicating with the seller, the consultant will inform the detailed information of the IP to the buyer. If the buyer is not pleased with the selected IP, the consultant will carry on searching until an IP meets the need of the buyer.

(4) Communicating with the seller. After the buyer reaches a preliminary deal intention on a particular IP, the IP transaction consultant will search the legal status of the IP offline, and get in touch with the IP holder once confirming that the IP is of no legal risk according to the contact information in the IP transaction database. They will discuss about the legitimacy of IP holder, quotes and other information. At the same time, the consultant will give feedbacks to the buyer to help both parties reach a deal intention.

(5) Buyer confirming the purchasing order. After the IP buyer and IP seller reach their deal intention, the consultant will input all information such as transaction subject, transaction object, price, etc. into the online system. The system will generate a purchasing contract between the buyer and the IP transaction platform. The buyer may double check the transaction information, such as transaction subject, transaction object, transaction price and contract terms, and then verify the purchasing order. Most of the provisions of IP purchasing contract are specification of rights and obligations, and agreed details of the order execution. Therefore, the standard contract generated online will save a lot of time.

(6) Order payment. After the buyer confirms the purchasing order online, he/she will pay for the order through online banking system or third-party payment system. The online payment is quite common in the e-commerce platform, technology can ensure the security of the payment. The online payment will greatly reduce the time on payment for the buyer, meanwhile the efficiency is quite improved. After online payment, the IP purchasing contract comes into force.

(7) Seller confirming the assignment order. After the consultant inputs such information

as the seller's name, the object of the transaction, transaction price and so on, the assignment contract will automatically generated and sent to the seller. After the seller confirms the contract information, the transaction platform will pay the seller, and the IP assignment contract comes into force.

(8) Order execution. The IP order turns into the offline execution once the buyer and the seller have confirmed their orders. The transaction consultant will inform both sides to provide related materials for IP assignment, such as power of attorney, certification, assignment agreement, etc. These materials are necessary to complete the transaction. The IP transaction platform is responsible for completing all relevant formalities and sending the admissibility evidence to the parties of the transaction.

(9) The official announcement. After receiving the assignment of IP application, the relevant official department will check the related materials if it can be approved. If the application passes the examination, the official department will issue a certificate to approve the IP assignment and publish the announcement. Assignment announcement is a necessary part of transaction, and it can only be carried out offline. The transaction consultant will inform the successful assignment of IP to both parties once the announcement is published, and post the certificate of assignment to the buyer.

(10) Rating and sharing. Upon completion of the IP transaction, both parties can rate online on the transaction and share their experience in the transaction process. Through the online rating and sharing, the IP participants will increase the online time of the platform. On one hand, the interactivity of IP transactions can be enhanced. On the other hand, the customer loyalty to the platform will be guaranteed.

6.4 The Inspiration from Patent Transaction Platforms

Meanwhile, the present patent transaction platforms explore some valuable experience, O3 IP transaction mechanisms summarize the successful experience of the domestic and overseas patent transaction platforms introduced in Chapter 5. These platforms provide reference and inspiration for O3 IP transaction mechanisms, O3 adopts some corresponding measures to respond the experience. Table 6-3 shows the main inspiration from each patent platform and the corresponding measures of O3.

Table 6-3: Patent Platforms' Inspiration for O3 IP Transaction Mechanisms

Name of Patent Platform	The Main Inspiration	The Corresponding Measures
National Patent Technology Exhibition and Exchange Center (Shanghai)	Specialized commercialization platform	O3 is based on the reputation and scale effect of China Trademark Supermarket Website
China Technology Exchange	Integration of online and offline services, one-stop service	O3 divides the IP transaction into online and offline processes, O3 provides the whole services from releasing IP transaction information to completing IP transaction
China Zhejiang Online Technology Market	Demand side pull	IP buyer accessing the platform via the websites and APP is the first step of O3 IP transaction
Ocean Tomo	Due diligence	Before getting in touch with the IP seller, check the IP is of no legal risk in the IP transaction database
Intellectual Ventures	A bountiful of transfer channels	O3 is based on the IP commercialized channel of China Trademark Supermarket Website
Intellectual Property Exchange International	Standard terms	O3's transaction contract is automatically generated

Source: This Thesis.

6.5 Benefit Analysis of O3 IP Transaction Mechanisms

Li (2014) pointed out that internet is a new tool for people to start their own businesses and make innovation when he attended the first World Internet Conference. In addition, Li (2015) proposes the plan of developing the "Internet+" in March 2015 in the Government Work Report. Promoting mobile internet, cloud computing, big data, and so on to facilitate e-commerce. Thus, the "Internet+" has attracted more and more attention, Huang and Wang (2015:5) note that "'*Internet+' relies on internet information technology to achieve the combination of internet and traditional industries in order to optimize the production elements, update the business system, business model and other ways to complete the*

transformation and upgrading of economy." With further development of the "Internet+", internet has begun to accelerate to penetrate into all aspects of life, especially the service industry. The deep integration of internet and traditional service industry has not only changed people's lives, but also changed the traditional service industry. IP service is an important part of the modern service industry. IP transaction, which is an important way to utilize IP, is critical to the commercialization of IP. After analyzing the features of the "Internet +", IP transaction, and the mature e-commerce models, CIPRUN proposes the O3 IP transaction mechanisms.

O3 is not a subversion of the traditional IP transactions, but integration and optimization of the entire process through internet in the form of completing the processes of buyer access to the platform, order creation, order confirmation, order payment, rating, and sharing online. O3 can fully take advantage of internet in information collection, information process, electronic payment, sharing, and rating. The economic and social benefits of O3 IP transaction mechanisms are as follows:

(1) In terms of economic efficiency, O3 can take advantage of internet in information concentration and integration to attract as many potential IP transaction participants as possible to reach the scale effect. It can reduce information search cost of IP transaction to improve overall economic efficiency. Meanwhile, O3 IP transaction mechanisms subdivide and re-integrate the non-standardized processes in traditional IP transactions. The new processes can be standardized and then conducted online. It greatly improving the work efficiency and saving transaction time and contract cost. At the same time, processes of order creation, confirmation, payment and rating are consistent with the traditional e-commerce model processes, which are in line with the customers' use habit and may reduce the cost of learning the transaction.

(2) As to social benefits, "Internet +" has been accepted by the whole society. There are many new attempts in the service industry with the integration of internet, such as health care, education, home services, etc. However, these models have not gained wide public acceptance and are still in the pre-trial stage. In other words, there is no sound business model of "Internet+" in China now. At present, China's service industry generates more than 50% of GDP, and the importance of the service sector in economic restructuring and development has become increasingly apparent. O3 successfully introduces "Internet+" into IP transactions, which offers reference for the deep integration of other industries with internet. Meanwhile,

the integration of internet and traditional services will also spawn many new industries, and undoubtedly provide some inspirations to the developments of the new industries. The successful implementation of O3 allows the improvement in service capacity and service quality of IP industry. With the help of O3, IP can play a more important role in providing impetus for China's economic transformation and development.

6.6 Policy Appeals on the IP Transaction

In the previous chapters' research, I have discussed about the environment of China's IP transaction, experience of some platforms that are in sound operation, and the major problems confronting the IP transaction platforms. Overall, the role played by the transaction platforms in China is not active enough. It has not provided strong support for the commercialization of IP, nor has it played its due role to the transformation and upgrading of the economy. Since the IP market is relatively small and undeveloped, the policy is very important. The government shall issue policies to guide and encourage the IP transaction market. In this context, I put forward the following policy appeals about IP transaction based on the previous research.

6.6.1 Encourage the Integration of Market-oriented IP Transaction Platforms

Nowadays, the market-oriented trademark transactions have formed large-scale platforms. For instance, China Trademark Supermarket Website has been the leading platform in the volume of trademark transactions for fourteen consecutive years. It also has become the representative intermediary of trademark transactions. Obviously, the market-led model enables the long-term and healthy development of the trademark transaction.

As for patent transactions, there has been no particularly influential national transaction platform in China. Although China launched *National Patent Technology Exhibition and Exchange* project in 2006, the program has not yet become influential enough on patent transactions. Due to the lack of unified operation and integration, the local platforms are not running well as they do not play an active role in the commercialization of patents. Meanwhile, some private institutions are also making attempts on the patent transactions, but the development is very slow due to the lack of funds. As there are many patent platforms in China, the patent buyers and patent sellers have to spend a lot of time and money on information search among different platforms, which greatly reduces the efficiency of

transaction. In addition, the government leads some patent platforms, the demand of the market cannot be responded in time, thus undermining their role.

At present, the transaction markets of different types of IP are clearly separated. The market segment in China results in different types of IP transaction information being scattered in different platforms, which is the same case for the same type of IP transaction information. It greatly increases the information cost and reduces efficiency. The integration of different types of IP transaction information into one platform and the utilization of internet can greatly reduce both parties' information costs. Besides, the advantage on marketing and advertising of a large comprehensive platform will also reduce the total transaction costs.

IP transactions have not offered enough driving forces for economic restructuring and development in China. Therefore, the government shall take advantage of the national policy and the market-oriented means to establish a unified IP marketplace. Compared with government orientation, the market orientation will fully excite the potential, initiative and creativity to add more vitality to IP transactions. So a new and successful business model should be explored. The government should issue policies to encourage market-oriented operation of IP transaction platforms, while providing policy support for market-oriented operation process. First, the government should issue policies to encourage the integration of different types of IP transactions. Patents, trademarks, and copyrights are separated in different IP markets. National policies should be introduced to encourage the promotion of the merger or alliance of these platforms in order to form an IP platform that has absolute influence on the commercialization of IP. It can drive the development of the transaction through the exemplary role of the platform. Second, the government shall build two unified online and offline markets by e-commerce. With the advantages of internet, the online and offline markets can exert their different functions. The online market is designed to publish and collect information, and dynamically track process. Due to the specialty of the transaction objects and needs of the two transaction parties, the offline face-to-face communication in detail is also required. Through the offline market established by the unified platform, the problems in IP transactions can be dealt with, thus better promoting IP transactions.

6.6.2 Encourage Innovative IP Transaction Patterns

Different types of IP have different characteristics, and even the same type of IP has its own particularity. So there are the most suitable corresponding transaction patterns for each IP.

For example, there have been some attempts on patent auction and copyright share exchange in China, which enrich the experience of IP transactions and also provide a new perspective for the theoretical study of IP transactions. At the same time, encouraging innovative transaction patterns should allow to take more flexible approaches to complete transactions as soon as possible. If the government strictly regulates the transaction patterns of IP, exploration and development of IP markets will be limited, and ultimately negatively affect the IP commercial operation and IP transaction efficiency improvement.

In view of the confusion in property transactions, art share exchange, and commodity spot market, in November 2011, the State Council started to screen and rectify various exchange markets. To be specific, in terms of property transaction, it regulates that the property is not allowed to split any interest into equal shares for public offerings. With the introduction of stringent regulatory policy, the share exchange of culture assets and equality exchange are all paused, symbolizing the pause of exploration in China on artwork share exchange. Share exchange is a new attempt of IP securitization transaction in China, and it has some attempts abroad. For example, IPXI launched URL in 2011, which is a kind of share exchange. On one hand, IP share exchange brings the IP holder profits that will be earned in the future, and puts IP into commercial use in advance. On the other hand, share exchange can lower the threshold of IP transactions, attract more investors, and increase the liquidity of IP. The liquidity is very important in the financial market, as it can activate the IP market so that the real buyers can buy the shares in time. What is more, share exchange opens up a new investment channel to the public, attracts attention of public opinions, and improves the public awareness of IP commercialization. Therefore, share exchange should be encouraged, and the government should try to appropriately supervise and deregulate.

Meanwhile, even though there have been some new attempts on auction and bidding of IP, the public's awareness and acceptance are still not enough. Government can take advantage of public opinions, expand the publicity of IP auction and bidding, spread relevant knowledge, and encourage more agencies to take these ways of IP transactions. Thus more participants can understand and accept these new ways of transactions. In the current circumstance of low IP commercialization, innovative transaction becomes particularly necessary. The government shall encourage innovative IP transaction patterns to change this status. It means deregulation or development of better ways to improve the supervision of risks so as to explore more flexible ways to adapt to the development of IP transactions.

6.6.3 Introduce IP Transaction Insurance Products

In the environment of market economy, insurance is not only a risk management tool, but also a financial product. Generally, insurance offsets the risk that a future event with potentially catastrophic damages may occur by presently paying a premium worth a fraction of those damages (Goode, 1999). IP transaction insurance is a financial innovation that brings risk management tools into the process of IP transactions in order to circumvent IP contract risk and execution risk. Currently, the IP insurance is mainly focused on patent insurance, including patent enforcement insurance and patent infringement liability insurance. Patent enforcement insurance refers to the patentee or other related persons transferring the risks of paying investigation costs, legal fees and other fees in patent enforcement to the insurance company with the insurance company responsible for compensation. The patent infringement liability insurance refers to the insured insuring on no fault infringement tort in production and business activities. When a patent owner or a third-party claims infringement compensation, the insurance company will pay the compensation. At the beginning of 2012, Beijing and other eight cities were selected by SIPO as the first batch of patent insurance pilot cities. In November of the same year, 20 cities were selected as the second batch of patent insurance pilot cities.

As a risk management tool, IP transaction insurance is a good financial tool to circumvent IP transaction risks. In the process of IP transactions, the asymmetric information between the two parties will lead to the uncertain knowledge of legal status, validity of rights and actual performance ability, which may bring high risks. In IP transaction insurance, the applicant may apply for the subject of insurance and pay certain insurance premiums to the insurance companies. The insurance company is responsible for checking the legal status of insurance subjects, analyzing the effectiveness of their rights, and investigating the counterparties' actual performance ability. In the time limit for insurance, if the IP transaction is not completed out of the agreed provisions in the insurance agreement, the insurance company shall pay the compensation to policyholders in accordance with the contract.

By introducing IP transaction insurance into IP transactions, the moral hazard of both parties can be addressed. Both parties may focus on the value of IP itself, analyze the benefits of IP, and avoid legal problems and compliance issues that may ultimately affect the deal. IP transaction insurance can save time for both parties, reduce communication cost, and improve the efficiency of transaction.

6.7 Conclusions

In order to solve “the dilemma of IP transaction”, this chapter developed the O3 IP mechanisms operated by CIPRUN, which focus on lowering the transaction costs by subdividing and re-integrating the IP transaction process. The process division of O3 IP mechanisms improves the efficiency and participants’ experience through online and offline processes. The online processes reduce the costs to a large extent by internet. Meanwhile, the offline processes conducted by the experienced IP transaction consultants can maximize exchange value. To sum up, the O3 IP mechanisms are promising attempts for solving “the dilemma of IP transaction” and optimizing the transaction mechanisms by re-integrating the IP transaction process.

This chapter proposed three suggestions on IP transaction policies, i.e. the integration of market-oriented IP transaction platforms, innovative IP transaction patterns, and IP transaction insurance.

Chapter 7: Conclusions and Prospects

The first chapter introduces the research background, object, questions, and methods, and draw the framework of the Thesis. The second chapter does research on China's history and evolution of IP transactions, the theoretical research of IP transaction, analysis of the tradability of IP, the types of IP, transaction patterns of IP, and IP valuation. The third chapter provides a study on the IP transaction mechanisms model from transaction subjects and transaction costs. The fourth chapter is the empirical study of trademark transactions and analyzes the factors affecting trademark transaction prices using econometric methods and the transaction data of China Trademark Supermarket Website. The fifth chapter is the case study of current patent transactions. It compares domestic transaction platforms with their international counterparts, summarizes the advantages and disadvantages, and analyzes the trends in patent transactions to provide support for patent transaction platforms. The sixth chapter proposes the O3 IP transaction mechanisms to solve the dilemma of IP transaction. Meanwhile, the policy appeal on IP transaction is also mentioned. The seventh chapter provides the results of the research, namely, the basic features of China's IP transaction platform, and puts forward the research prospects of the Thesis.

7.1 Basic Features of China's IP Transaction Platform

The previous chapters provide a detailed analysis of the IP transaction mechanisms from the theoretical and practical aspects. Based on the aforementioned analysis, China's IP transaction platform should include the following features.

(1) E-commerce. Since the commercial application of internet, e-commerce has gained rapid development. Currently, the common patent transaction platforms, trademark transaction platforms, and comprehensive IP transaction platforms all have some e-commercial characteristics. IP transaction platforms rely on the internet environment and the browser/server mode to help IP transaction players negotiate on the objects, the performance, and details of executing contract without meeting each other, thus ultimately

completing IP transactions. The major advantages of e-commerce include lowering transaction costs, reducing intermediate links, and increasing business opportunities. Some platforms realize e-commerce in transaction information, publication and contract execution, while some may realize e-commerce in the whole process. The O3 IP transaction mechanisms operated by CIPRUN is a successful attempt of e-commerce.

(2) Multiple types of IP transactions. Currently, the major domestic IP transaction platforms generally focused on one type of IP transactions. The division of different types of IP transactions results in market segmentation and low efficiency. The separation of different types of IP markets will increase the search cost for IP transaction participants, thereby lowering the IP markets' performance. By creating a comprehensive IP transaction platform, various types of IP sellers and buyers can be attracted to release information related on patents, trademarks, copyrights and even other types of IPs. The abundant IP transaction information on the IP platform is a key to the success. Therefore, various types of IPs will attract more attention to join the IP transaction platform, and eventually activate the transactions. Meanwhile, the IP sellers usually own more than one kind of IPs. If the platform allows the sellers to publish different types of IP information, it will save the time and energy of the IP sellers. Furthermore, the buyers can easily find different types of IPs in the same platform, which will reduce the search costs of the buyers and improve the performance of transactions.

(3) One-stop and whole-process service. One-stop service refers to the enterprises providing customers with complete one-package service. During the process of IP transaction, the one-stop service provided by the platform should include the process from the conclusion of a deal intention by a buyer and a seller to the completion of IP assignment or license. The platform is in charge of drafting contract and application submission in order to ensure that the transaction can be completed, and eliminate the troubles of the buyer or seller. In this process, the platform can exert to the utmost the special ability to reduce the related costs in IP transactions.

(4) Multiple transaction patterns. Different IP transaction patterns have different characteristics, and different types of IPs shall have different and flexible ways for transaction. Even for the same type of IP, various transaction patterns can be applied according to its specific features and value in order to complete the transaction.

(5) Derivative services of IP transactions. The purpose of providing derivative services of IP transactions is to accelerate the IP transactions, and resolve the difficulties of both parties.

It means providing related services to improve the external environment. The more comprehensive and professional the derivative services of IP transactions provided by the IP transaction platform are, the faster the completion of transactions will be.

7.2 The Solution to "the Dilemma of IP Transaction" in China

This section describes the answers to the research questions about the solution to "the dilemma of IP transaction". What are the suitable mechanisms of IP transaction to reduce transaction costs and maximize exchange value in the context of sporadic subjects and massive IPs? How to optimize the mechanisms to solve the dilemma of IP transaction?

(1) How to reduce transaction costs by optimizing the mechanisms? E-commerce and other services are effective tools to lower the IP transaction costs. The sporadic subjects increase the search costs of transaction. The transaction information can spread broader with the help of internet. Meanwhile the transaction time and space limitation can be eliminated. These advantages of e-commerce can lower the IP transaction costs. So, the present IP transaction platforms are e-commerce platforms, especially the O3 IP transaction mechanisms. Meanwhile, subdividing and re-integrating the IP transaction process is useful for reducing the transaction costs because some processes completed online improve the efficiency. Furthermore, one-stop services, derivative service and comprehensive platform are lubricant for IP transaction, they can also lower the transaction costs to some extent.

(2) How to maximize exchange value by optimizing the mechanisms? The specialized transaction consultant is important to realize the maximum exchange value. Matching the supply and demand is the most important link in the IP transaction. The specialized transaction consultant can well match the IP buyer's demand and IP seller's supply. In the transaction process, the extent of IP information disclosure is the key point to maximize the exchange value, based on the well match of demand and supply, the specialized transaction consultant can promote the transaction by the most appropriate disclosure of IP. That is why the IP transaction do not complete through online thoroughly. The specialized transaction consultant team is also the success secret of O3 IP transaction mechanism and the core-competitiveness. Meanwhile, the platforms' participants are also important to the realization of the maximum exchange value, because they can bring more transaction bids to increase the transaction's liquidity. O3 IP transaction mechanisms are based on China Trademark Supermarket Website, which has a large number of IP transaction participants and

good reputations. It is another secret to O3 IP transaction mechanisms' success. The O3 IP transaction mechanisms are the specific measures to optimize the IP transaction mechanisms in China.

7.3 Research Conclusions and Prospects

There are three contributions in the Thesis:

(1) Articulate a conceptual discussion concerning IP transactions. The Thesis develops theoretical model of IP transactions consisting of transaction subjects, objects and processes. This model matches the practical requirement and the theoretical development needs.

(2) Provide an empirical study on trademark transactions. Based on the data of China Trademark Supermarket Website and econometric methods, this Thesis analyzes the factors affecting the transaction prices of trademarks. This Thesis also analyzed the impact of trademark distinctiveness, trademark classification, and trademark transaction subjects on the prices of trademarks for the first time in the case of China.

(3) Propose the O3 IP mechanisms operated by CIPRUN. The process division of O3 IP mechanisms improves the efficiency and participants' experience through online and offline. The O3 IP mechanisms are very valuable attempts for solving "the dilemma of IP transaction" and optimizing the transaction mechanisms by re-integrating the IP transaction process.

Through the theoretical and practical research on China's IP transaction mechanisms, this Thesis puts forward the basic ideas of IP transaction platform construction in China, and analyzes its corresponding features. The platform is still in the process of exploration. Thus, both theoretical research and practical research have certain limitations.

(1) This Thesis has not made analysis on the performance of the combination of different transaction patterns and different types of IP. For example, is agreement-based transaction the best way for trademark transaction? Can trademark auction or bidding achieve better performance on transaction? Is patent auction better than patent negotiation transaction? All these questions would be answered through analysis in the future research.

(2) The innovative transaction models such as IP collateral financing, IP trust and IP securitization are the development trend in the future. However, this Thesis has not provided a more detailed study on them. So the follow-up studies can focus on innovative transaction models, and make some in-depth research.

(3) IP evaluation is an important way to support IP transactions. Currently, there are already several cases. However, this Thesis only briefly introduces several evaluation methods and fails to provide an in-depth introduction of various evaluation methods with actual trademarks and patents. Thus, future studies can focus on the various evaluation methods from the perspective of practice.

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