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Types and Methods of Assessing the Value of Intellectual Property Pledge Financing

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Abstract: China has a large stock of intellectual properties and a strong capacity for indirect financing. In the process of shifting from factor inputs supporting high economic growth to technological innovation contributing to high-quality economic development, intellectual property pledge financing plays an extremely important role. Moreover, as a new financing channel, intellectual property pledge financing can effectively alleviate the financial pressure on the development of small and medium-sized enterprises. Additionally, intellectual property pledge financing can also help promote the transformation of knowledge achievements and alleviate the financial problems of enterprises to a certain extent. Although China's intellectual property pledge financing has seen rapid development in recent years, there is still a large gap compared to the number of intellectual properties and the financing needs of enterprises. This is mainly attributed to the easy depreciation of intellectual properties, instability of rights, and other characteristics, which cause difficulties in assessing the value of intellectual property pledge financing and aggravates the risk and difficulty of intellectual property pledge financing. Therefore, how to scientifically assess the value of intellectual properties for the purpose of pledge financing has become an issue worthy of in-depth study and exploration at this stage.

Keywords: Intellectual Property; Pledge Financing; Value Assessment; Types and Methods.

1. Introduction

In recent years, China's intellectual property pledge financing has developed gradually from scratch and has achieved preliminary success. According to statistics, the registered amount of China's patent and trademark pledge financing reached RMB 218 billion in 2020, an increase of 43.9% compared with the previous year, and the number of pledged projects was 120.93 million, an increase of 43.8% compared with the previous year, achieving the biggest gain during the 13th Five-Year Plan period [1]. During the 13th Five-Year Plan period, the amount of China's intellectual property pledge financing doubled compared with the previous five-year plan, totaling RMB 709.5 billion[2]. Although China's intellectual property pledge financing has been developed to a certain extent, the many problems faced at present should not be underestimated, particularly the assessment of the value of the pledge has been widely concern by the industry. The value assessment of intellectual property pledge financing refers to the behavior and process of analyzing, estimating, and giving professional opinions on the value of intellectual property for the purpose of pledge financing on the valuation date by professional institutions and personnel in accordance with relevant laws, regulations, and valuation standards. Therefore, this paper provides an in-depth exploration of the issues related to assessing the value of intellectual properties for the purpose of pledge financing.

2. Current Status of Development of Intellectual Property and Intellectual Property Pledge Financing

2.1. Current Status of Intellectual Property Development

In 2020, the number of various types of patent rights authorized in China significantly increased compared with the previous year. In 2020, the number of various types of patent rights authorized in China compared with the previous year has significantly increased. Among them, invention patents increased by 17.02%, utility model patents increased by 50.27%, and design patents increased by more than 31.4%. Furthermore, in the same year, China's trademark registration was 5,760,700 pieces, and as of the end of 2020, the number of valid registered trademarks totaled 30,173,100 pieces (As shown in figure 1-2). [3]

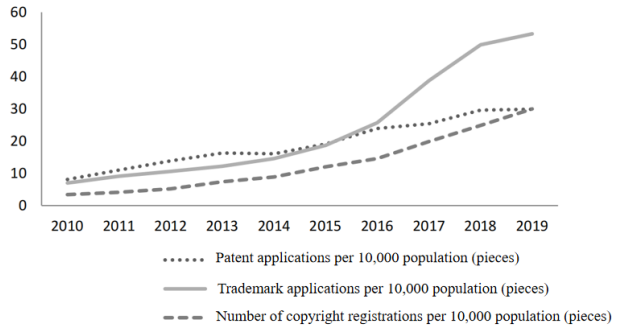

Figure 1. Applications for various types of intellectual properties in China in recent years

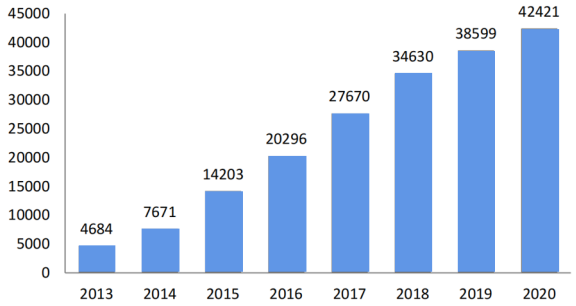

Figure 2. Statistical graph on the number of administrative adjudication on patent infringement disputes in China since 2013

2.2. Current Status of the Intellectual Property Pledge Financing Development

The overall development of intellectual property pledge financing in China has not been long. The first attempt was made by the Industrial and Commercial Bank of China at the end of the 20th century; a national seminar on intellectual property pledge financing was held in 2006, with the participation of financial institutions in Beijing and Shanghai; and from 2008 to 2010, the State actively promoted the pilot work in cities. Additionally, from the legal level, the 1995 Guaranty Law stipulates that intellectual properties can be pledged; the 2007 Property Law expands the scope of the pledge to include the rights that the debtor or the third party has the right to dispose of. Since then, the development of intellectual property pledge financing in China has gradually been on the right track.

From 2018 to 2020, the proportion of the added value of China's patent-intensive industries in GDP reflected a development trend of first stabilizing and then increasing, and the driving role of patents in national economic growth was further enhanced. In 2020, the added value of China's patent-intensive industries will reach 12.13 trillion yuan, an increase of 5.8% year-on-year, accounting for 11.97% of GDP, an increase of 0.35 percentage points over the previous year (As shown in figure 3).

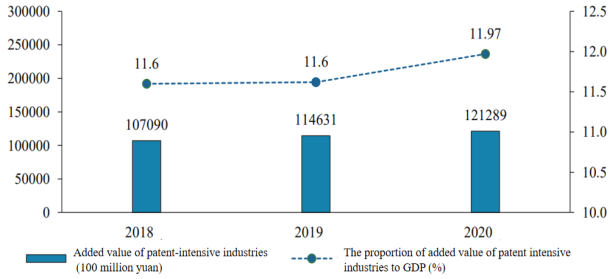

Figure 3. Changes in the added value of national patent-intensive industries in 2018-2020

Moreover, China's copyright pledge financing work has also achieved certain effects. However, compared with patent and trademark rights, the amount and number of the same period are markedly lower, and there is still a large space for improvement. In 2019, the total amount of China's social financing amounted to RMB 25.67 trillion[4], and the amount of patent right and trademark right pledge financing together only accounted for 0.55% of it, which is a decline compared with 2018. Therefore, China's intellectual property pledge financing needs to be further developed, and its contribution to social financing needs to continue to improve (As show in table 1).

Table 1. Statistics on the proportion of total financing pledged for patent and trademark rights in the amount of social financing

Year	2014	2015	2016	2017	2018	2019
Amount of social financing (hundred million yuan)	164600	154100	178000	194400	192600	256700
Total amount of financing pledged for patent and trademark rights (hundred million yuan)	987.3	899	1082.6	1035.5	1200.2	1414.8
Proportion of pledged financing amount to social financing amount	0.6%	0.58%	0.61%	0.53%	0.62%	0.55%

(Data source: Evaluation Report on the Development Status of Intellectual Properties in China, 2019)

3. Basic Process of Intellectual Property Pledge Financing

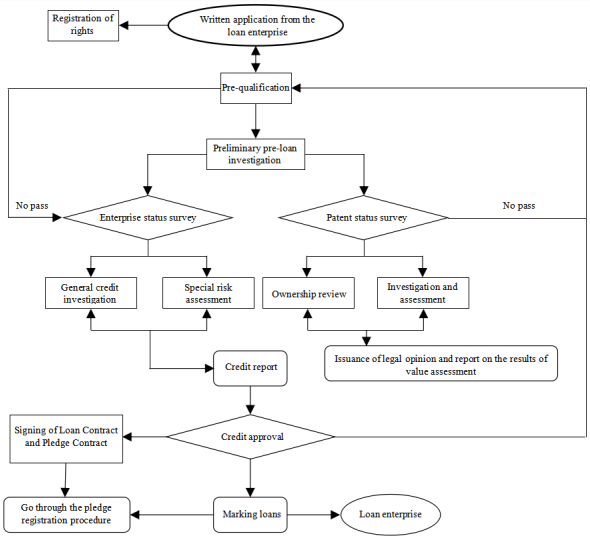

Figure 4. Basic flow diagram of intellectual property pledge financing [5]

From the written application, pre-qualification, and preliminary pre-loan investigation of the loan enterprise to the credit report, credit approval, and make loans, the basic process of intellectual property pledge financing can be summarized as shown in Figure 4.

4. Selection of Value Types for the Assessment of Intellectual Property Pledge Financing Value

4.1. Connotations of Value Types and Selection Differences

4.1.1. Connotations of Market Value, Liquidation Value, and Mortgage Lending Value

In evaluation theory research and practical operation, the market value and liquidation value have a high frequency of application. In particular, market value refers to the estimated amount at which the evaluation object would be valued in a normal arm's-length transaction between a willing buyer and a willing seller, each acting rationally and without any coercion on the valuation date; and liquidation value is the estimated amount of the value of the appraisal object when it

is under abnormal market conditions, such as forced sale and quick realization.

Mortgage lending value is also a type of value that is addressed in the evaluation business for mortgage lending purposes and in related guidelines and literature. Specifically, mortgage lending value is an opinion of value estimated by an appraisal professional by analyzing factors, such as the current versus alternative uses of the underlying asset, long-term sustainability, and market conditions, to predict the future marketability of the underlying asset[6].

4.1.2. Major Differences in the Selection of Value Types

On the types of value in the assessment of the value of intellectual property pledge financing, academics pay more attention to the market value type and the mortgage value type. This is also true from a worldwide perspective, with the International Valuation Standards (IVS, 2017) and the Uniform Standards of Professional Appraisal Practice (USPAP, 2018-2019) advocating the use of market value, and the European Valuation Standards (EVS, 2012) advocating the use of mortgage value. Currently, there is no clear opinion on the selection of the type of value, and experts and scholars have different views.

The difference between market value and liquidation value exists between the two parties to the pledge financing transaction. Specifically, the differences between the borrowing enterprise and the bank mainly arise from the different significance of the pledged intellectual properties to the two parties. Moreover, from the bank's point of view, the subject matter of the pledge is a kind of guarantee for the security of the bank's external borrowing. In the case of the first repayment, the source is stable, and the value of the subject matter has little effect on it. However, when the borrowing enterprise has insufficient solvency, in accordance with the provisions of the law, the bank has the right to deal with the pledge's subject matter and the compensation's priority. At this time, the bank needs to realize the subject matter to compensate for its own losses. Furthermore, it requires that the pledged intellectual properties must be able to serve as a guarantee of repayment to ensure the safety of their own funds in liquidation. Therefore, the liquidation value for the bank is a more prudent choice. From the perspective of the borrowing enterprise, the pledged intellectual property is an essential tool for the enterprise to make profits, and it is more concerned about the value of the intellectual property as a factor of production for the enterprise; on the other hand, the value of the pledged intellectual property is closely related to whether or not the enterprise can obtain a loan and the amount of the loan, and it inevitably wants to obtain more borrowings to support the enterprise's development. Therefore, the enterprise's market value of intellectual property is reasonable and favorable.

4.2. Relationship between the Selection of the Type of Value and the Parties to the Pledge Financing

The enterprise and the bank are the two interested parties in intellectual property pledge financing. For the enterprise, intellectual property pledge is a means of financing, and the key concern in the process is the funds that can be obtained; for the bank, it is one of its many businesses through which it not only can get profit but also must reduce the risk that it faces. Therefore, intellectual property pledge financing is more like a game between enterprises and banks, and the selection of the type of value is an important factor affecting the game.

From the bank's point of view, compared with the value of intellectual properties that is most likely to be realized under normal conditions, it pays more attention to the solvency of intellectual properties, which is aimed at guaranteeing the safety of the funds it lends out and reducing its own risks. When the loan is due, once the enterprise is unable to repay, it needs to realize the intellectual property quickly to compensate for its own losses. Therefore, for the bank, the intellectual property's value assessment is more focused on a kind of guarantee in the liquidation. However, what is obtained under the type of market value is the most likely value of the intellectual property under normal conditions, which is different from the bank's expectation. Additionally, using the market value type for assessment. If the market value of the pledged intellectual property fluctuates lower than the amount to be repaid before the maturity of the loan, the enterprise will not fulfill its contractual obligations, the bank's funds will be at risk, and the bank's interests will not be better taken into account.

From the enterprise's point of view, the pledged intellectual property is usually an important asset for the enterprise's profitability and will continue to be used for profitability as part of the overall enterprise structure during the pledge financing process. Therefore, for the enterprise, it prefers that the assessment of the value of the pledged intellectual property plays the role of a present guarantee or proof of value and that the enterprise is more concerned with the value that is most likely to be realized under normal operating conditions of the intellectual property. The liquidation value obtained is the evaluation of the intellectual properties under abnormal conditions, such as forced sale and auction realization. In the practice of intellectual property pledge financing, the maximum amount of loan provided by the bank is generally obtained based on the product of the appraised value of the intellectual property and the pledge rate. Moreover, in determining the pledge rate, the bank will generally take into account the borrowing enterprise's historical credit, production and operation, capital structure, industry status, and future expectations, which reflect the expected liquidation value of the intellectual properties as pledges when they are forced to be realized, which is essentially the discounting of their value. On this basis, if the liquidation value is used, it double-counts the realization risk faced by the intellectual property reduces the amount of borrowing that the bank can provide to the enterprise, and puts the enterprise in a more vulnerable position.

4.3. Relationship between the Selection of the Type of Value and the Objective of Assessing the Value of Pledge Financing

The selection of the appropriate type of value not only affects the value of intellectual properties as well as the amount of borrowing but also reflects the role of value assessment in revealing risks in the process of pledge financing. Currently, in actual operation, when the appraisal agency gives the appraised value of intellectual properties, the bank, based on the consideration of risk reduction and maintenance of capital security, calculates the final value by utilizing the pledge rate, taking the appraised value type and pledge rate into joint consideration. Furthermore, when the appraisal agency adopts the market value type for assessment, it only considers the value of the intellectual properties in the

normal State, and the value assessment result given is the present guarantee value of the intellectual properties, which does not reveal the risks faced by the pledge financing. At this time, it is necessary for the banking institution to combine the risks with the market and other factors to determine the pledge rate. Finally, when the appraisal agency adopts the mortgage value type, it analyzes the sustainability of the assets, market conditions, and present and future use and considers the risk factors in the pledge process, reflecting the value of the guarantee of intellectual properties' liquidity. At this time, the pledge rate is determined by the appraisal agency, and the bank does not need to double-calculate the rate.

5. Assessment Methods for Assessing the Value of Intellectual Property Pledge Financing

5.1. Basic Methods

The basic methods of assessment include the cost approach, income approach, and market approach.

The cost approach is a method of obtaining the appraised value by subtracting various depreciations from the replacement cost of intellectual property, which can truly reflect the input cost of intellectual property. However, it is often limited by the fact that many factors affect the value of intellectual property, and depreciation is difficult to quantify. Additionally, the replacement cost cannot reflect the value of intellectual labor, and the value of intellectual property refers more to the future economic benefits it brings, and the cost method cannot reflect the future economic value. Nevertheless, Rand S.J. (1990) believes that the cost approach is more scientific when constraints exist.[7] The market approach utilizes the recent transaction prices of comparable trading assets in the trading market and calculates the appraisal value by adjusting the differences. Moreover, since it is difficult for China's intellectual property transaction market to meet the standards for the application of the market approach, the originality and advancement of intellectual assets make it difficult to find similar transaction cases in the market, thus making the method inapplicable. Most of the existing studies and practices have adopted the revenue-sharing method. The use of the revenue approach needs to satisfy the three conditions of expected future earnings of intellectual properties, the accompanying risks, and the years of earnings that can be reasonably predicted. Additionally, since intellectual property is an intangible asset, it often needs other assets as a carrier to make profits. However, there are still some unpredictable evaluation indexes, which limits the application of this method. Sametal (2001) fully considered the effect of technological maturity on the evaluation of patent assets and concluded that the cost approach is effective under very immature technological market conditions; the income approach is utilized as the technological market gradually matures, and the market approach is more convenient in a fully mature market.[8]

5.2. Derivative Methods

5.2.1. Real Options Method

The assessment of the value of intellectual property pledge financing is an assessment of the value of the property rights held by the enterprise in a certain period of time, and then it can be handled similarly to the real options method (Parr, 1994). The assessment results from the traditional assessment methods are static. The enterprise as the main source of value influencing factors of intellectual properties is dynamic, and the real options method can dynamically reflect the changes of external factors, such as the market and the enterprise. Furthermore, considering this point, Pakes introduced the option theory into the assessment of the value of patent assets as early as 1986.[9] The options can be categorized into American options and European options according to the execution time. The American options can be executed on or before the expiration date, while the European options can only be executed on the expiration date. The value of intellectual property assets is different at different times, and investors are free to choose the investment time. Therefore, Fan Longzhen and Tang Guoxing (1999) believe that they can be regarded as American-style options to calculate the value.[10] However, many factors affect the value of intellectual property, such as economic life, market maturity of technology, and so on, which will have a certain effect on the assessment results.

5.2.2. Pledge Coefficient Method

The pledge coefficient method is divided into four main steps: (1) collecting relevant information; (2) estimating the market value; (3) determining the pledge influence factor; and (4) calculating the value of the pledged loan. Moreover, the key step of the pledge coefficient method is to calculate the pledge coefficients. Specifically, it rationally separates the value influencing factors under normal conditions and pledge conditions and assigns weights to each factor through mathematical modeling. After separating the value influencing factors under the pledge conditions, the value assessment index system is established, which generally adopts the fuzzy comprehensive evaluation method and combines the hierarchical analysis method and expert scoring method to weight each factor, and finally calculates the pledge influencing coefficient.

6. Conclusion

The type of value assessment of intellectual property pledge financing is a widely disputed issue in theory and practice. Moreover, the main dispute lies in selecting the market value type, liquidation value type, and mortgage value type. This paper compares different methods based on the conditions of value formation of pledge financing, the degree of activity of the intellectual property market, the accessibility of important parameters, etc., and points out that the market approach and the cost approach usually have higher prerequisites when they are applied to the value assessment of pledge financing of intellectual properties. Therefore, it selects the income approach, which is relatively more applicable, to assess the value of intellectual properties.

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