



# Intellectual Property Rights Securitization Models Selection and Policies Development in China: Based on a Multi-Case Comparison

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## Abstract

Intellectual property rights securitization (IPRS) is a fundamental approach to monetizing intellectual property rights to resolve financing difficulties for scientific and technological enterprises. It is also a necessary way to realize the value of intellectual property rights. Existing researches in China only introduce foreign IPRS models but rarely discusses reasons behind the IPRS successes and lessons drawn from its failures. There are also rare IPRS policy researches and recommendations for IPRS development in China. This article cards the IPRS policies in China first, and then conducts a comparison research of intellectual property rights owners, obligees, originators, credit rating agencies, issuing scale, and so on as main information and data from the IPRS cases at home and abroad. Furthermore, this article constructs a three-dimensional policy model of “subject-element-process” and identifies the main problems from the laws and policies, operational models, valuation methods, investment objectives, tax and service rates, *etc.* of the IPRS. The results indicate that the model we construct is suitable for the Chinese market in that it describes the objectives and processes of IPRS as well as specific activities and capital flows. In the end, this article puts forward five policy recommendations for China’s IPRS development. The first is to add the intellectual property rights future implementation cash flow as the IPRS object. The second is to improve the existing evaluation methods. The third is to combine SPT and SPE models, establish in-house intellectual property rights service teams of security companies, set up government risk fund pools to lead IPRS, and reduce the investment threshold. The fourth is to explore the equity-debt convertible IPRS products and the intellectual property rights auction mechanism to make up for the losses of IPRS failure. The fifth is to formulate IPRS tax preferential policies, and lower the local government subsidy proportion for loan interests, service fee and loss compensation for IPRS.

## Keywords

intellectual property rights; securitization; model; policy

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## 1. Introduction

Intellectual property rights securitization (IPRS) is a good enterprise financing approach and a meaningful way to transform science and technology achievements and monetize intellectual property rights. In recent years, China has paid great attention to IPRS and encouraged its development continuously. On March 13, 2015, the Central Committee of the Communist Party of China (CPC) and the State Council of China issued the "Several Opinions on Deepening the Reform of Systems and Mechanisms and Accelerating the Implementation of the Innovation-driven Development Strategy" and formally proposed to "explore and develop IPRS". On December 22, 2015, the State Council issued the "Several Opinions on Accelerating the Construction of an Intellectual Property Power under the New Situation" and listed "exploring IPRS" as an important task of "building up an intellectual property rights operation service system". On September 15, 2017, the State Council issued the "Program for the Establishment of a National Technology Transfer System" and proposed to "launch a pilot program for IPRS financing". Since 2018, the Central Committee of the CPC and the State Council of China have issued a series of policies to encourage regions and cities such as Hainan, Tianjin, the Xiong'an New Area, the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) and Beijing, to further reform and open up to support the construction of free-trade zones, and to promote the development of the service industry. They especially demanded to "explore IPRS". In 2015, the China National Intellectual Property Administration (CNIPA) issued the "Opinions on Further Promoting the Intellectual Property Rights Financing Services" and proposed to "encourage financial institutions to conduct intellectual property rights asset securitization". In 2017, the CNIPA issued the "National Intellectual Property Strategy Promotion Plan" to encourage Hainan and the Xiong'an New Area to carry out IPRS. In 2018, the CNIPA and the China Securities Regulatory Commission (CSRC) established a pilot guidance working group to promote IPRS. Since then, China has been formally promoting the IPRS. In addition, the National Copyright Administration, the People's Bank of China, the State Administration for Market Regulation, and other departments have promulgated policies to support and promote IPRS.

IPRS is the process of using intellectual property rights or associated interests that yield predictable income streams as underlying assets, using future cash flows as support, enhancing credit through structured products, and securing cash investments by issuing securitized products. Scholars worldwide have carried out extensive research on IPRS. An early researcher on asset securitization, Schwarcz considered it alchemy (Schwarcz, 1993). Some factors should be considered before IPRS, including intellectual property rights asset valuation, the results of extensive due diligence, administrative costs, the potential for obsolescence, litigation risks, *etc.* (Jones and Hoe, 2006). In the process of IPRS, initiators separate the possible future income generated by intellectual property rights from the company and then transfer it to a Special Purpose Vehicle (SPV). The SPV uses it as the underlying asset, separates and reorganizes the risk and profit factors through management, and issues circulated rights certificates guaranteed by the underlying assets to investors. Investors can obtain income from buying bonds at a fixed revenue rate and selling the bonds of IPRS in the second market (Li, 2018). The IPRS effectively monetizes intellectual property rights, enhancing the liquidity of intellectual property rights and meeting intellectual property rights owners' financing needs quickly (Milani, 2005). Enterprises can realize the total value of the intellectual property rights assets by collateralizing and carrying out IPRS to improve their financing situation. As such, IPRS is more transparent than other types of secured transactions (Nisar, 2011).

Recent studies regard intellectual property rights as an asset that can be securitized and focus on asset

securitization commonalities (Gan, 2008). Many scholars have researched relevant IPRS topics, such as risk control and isolation method and the eligibility of intellectual property rights as underlying assets. IPRS requires separating patentees' risks, restructuring capital, and concentrating funds on technology development and application (Edwards, 2001). The IPRS assets are divided into assets from accounts receivable, intellectual property rights licensing agreements, intellectual property rights finance leasing activity, intellectual property rights product factoring contracts, or even litigation compensation. The essential issues in IPRS include assets evaluation, bankruptcy remoteness, guarantee rights and interest registration in the assets pool, credit enhancement and rating, tax incentives, and investor protection (Dong, 2009). Some scholars are concerned about issues of IPRS legislation. One study suggested countries worldwide should actively develop intellectual property rights financing to support economic development. Therefore, policymakers are needed to formulate substantive security transaction laws based on the actual situation before considering which laws apply to intellectual property rights guarantees (Sato, 2013). Effective IPRS legislation will improve capital market efficiency and promote technological innovation (Sweeney, 2013). Intellectual property rights assessment is an essential component of IPRS, which includes the due diligence of intellectual property rights assets and valuation of intellectual property rights asset portfolios. Due diligence aims to identify investment risks and analyze potential uses of intellectual property rights (Nemlioglu, 2019).

The existing researches generally focus on the IPRS process. Foreign IPRS researcher seldom consider IPRS policy development. Researches in China mainly focus on introducing foreign IPRS models and their practices, such as constructing and utilizing assets pools, and risk prevention mechanisms., but the studies lack an in-depth analysis of IPRS cases, models, and policies that may be suitable for the Chinese market. There is also a lack of research on IPRS model of intellectual property rights implementation, the drawbacks of government subsidies, and policy development of China's IPRS. This article cards the IPRS policies in China first. Then it launches a comparison research of intellectual property rights owners, obligees, originators, credit rating agencies, issuing scale, and so on as main information and data from the IPRS cases in domestic and abroad. And then, it constructs a three-dimensional policy model of "subject-element-process" to conduct a comparative analysis of IPRS and identifies the main problems of the IPRS laws and policies, operational models, evaluation methods, investment objectives, tax and service rates, *etc.* Finally, this article proposes corresponding policy recommendations to promote China's IPRS development sustainably.

## 2. Development of IPRS

Intellectual property rights, a type of intangible assets, are high-value commercial assets because they are exclusive rights for technologies or commercial marks, and these kinds of exclusive rights are endowed by law. Intellectual property rights can also enhance enterprises' pricing power. Enterprises with intellectual property rights can independently determine the price of related derivative products (Denoncourt, 2017). Since 2004, the World Intellectual Property Organization (WIPO) has been participating in discussions with the United Nations Commission on International Trade Law (UNCITRAL) to formulate the Legislative Guide on Secured Transactions and related annexes which are designed to accelerate the modernization of secured transaction legislation and promote intellectual property rights financing. In 2009, WIPO and UNCITRAL jointly organized a conference on intellectual property rights financing to gather opinions and promote policy-making (WIPO, 2009). In recent years,

the media has widely reported intellectual property rights financing by many high-profile international companies such as Apple, Disney, Facebook, IBM, Microsoft, Panasonic, Samsung and Sony. More and more small and medium-sized enterprises (SMEs) are also aware of the commercial value of intellectual property rights. Using intangible assets for mortgage loans can increase enterprises' valuations in the stock and credit markets. The availability of intangible assets of intellectual property rights is positively related to the possibility of enterprises using those intangible assets as collateral for mortgage loans (Loumioti, 2012).

There are many cases of IPRS in foreign markets. The copyright securitization of the music works of British singer David Bowie in 1997, the copyright securitization of DreamWorks films from 1997 to 2000, the patent licensing rights securitization of medicines developed by Yale University from 2000 to 2003 (Odasso and Ughetto, 2011), the trademark license agreement securitization of Guess in 2003 (Borod, 2005), and the IPXI Unit Licensing right (ULR) contract securitization from 2013 to 2015, as well as the cases of Columbia University, the German Industrial Park, Sony Corporation of Japan and other enterprises taking IEEE802.1 standard and related wireless communication network technology patent portfolios (which includes 194 patents) as the underlying asset are typical examples of foreign IPRS. The USA is a pioneer in IPRS and provides a significant reference for global IPRS. In 2006, Sears Holdings completed the largest IPRS recorded. This company securitized its three most significant brands, Kenmore, Craftsman, and Diehard, through KCD IP company and placed them in an independent and wholly-owned bankruptcy-remote subsidiary through ownership transfer. KCD IP receives a trademark license fee from Sears Holdings. Subsequently, KCD IP issued \$1.8 billion in bonds to a subsidiary of Sears Insurance (Brassell and King, 2013). IPRS in the USA is a bottom-up, market-oriented securitization model (Liao et al., 2020) dominated by SPVs and mainly adopted by large-scale high-tech industries. Copyright securitization is mainly concentrated in the film and music industries, and patent securitization mainly occurs in the pharmaceutical and biotechnology industries. Trademark securitization is mainly concentrated in the fashion and catering industries.

European IPRS mainly involves the securitization of sports broadcasting rights and ticket revenues in the early stage. Italy and the United Kingdom have successfully conducted several film and music securitization cases. In 1998, Spain's Real Madrid securitized its Adidas sponsorship and raised \$50 million. In 1999, Cecchi Goori, an Italian company, securitized the sales revenue and television broadcasting rights of more than 1,000 films. In 2001, Premier League Leeds United used its ticket revenue for the next 20 years as an underlying asset and issued \$71 million of securitized bonds to purchase top players. Philips securitized the exclusive licensing rights of a patent portfolio (including more than 600 patents) of organic light-emitting diode technology. The European model of securitization is a market-oriented trust model with a near-perfect credit enhancement mechanism. Copyright securitization in Europe is mainly concentrated in the film and music industries, broadcasting rights securitization mainly occurs in the sports industry, and patent securitization is mainly focused on pharmaceutical patents (Bao, 2017).

IPRS in Japan follows a government-led trust model. Most IPRS cases adopt the private equity model and are concentrated in SMEs and innovative enterprises. Copyright securitization mainly occurs in the film, animation, and game industries. The copyright securitization of music works generally adopts the "fund silent" partnership model, and patent securitization mainly occurs in the photo-electricity industry. The Ministry of Economy, Trade, and Industry (METI) began trying to securitize patent rights owned by enterprises in the information technology and biology fields in April 2002. The government first planned to set up an SPV before handing over its patent rights. The SPV takes the patent rights license fee

and royalty as the underlying assets to issue bonds, and the revenue from bond issuance is transferred to the patentee. In 2003, Scalar, an optical lens company in Japan, exclusively licensed its four optical patent rights to Pin Change Co., Ltd., a subsidiary of Matsushita Electric Group. Pin Change used the patent rights license fee as an underlying asset and transferred the future license fee to a bank-controlled SPV to issue bonds of 2 billion yen. In 2003, Japan Digital Contents Co., Ltd. conducted the first patent securitization with government support (Bao, 2017).

China has actively explored IPRS in recent years. The Wuhan Intellectual Property Exchange explored the equity and debt convertible securitization model in that the underlying asset is the income generated by the license, products, and services formed by the core intellectual property rights of the enterprise. In December 2018, the first standardized IPRS product in China, the "First Capital Beijing Culture & Technology Finance Leasing Co., Ltd. Asset-backed Security (ABS) Specific Plan Phase I" (after this "CUL&TECHFLCO ABS Phase I") was approved and successfully issued by the Shenzhen Stock Exchange. CUL&TECHFLCO ultimately issued five phases of this particular IPRS product. On December 25, 2018, the "Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan" was officially listed on Shanghai Stock Exchange. On September 11, 2019, the Huangpu District of Guangzhou and the Guangzhou Development Zone issued the "Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan". On December 26, 2019, the "Ping An Securities - Shenzhen High-Tech Investment Group Co., Ltd. (SZHTI) Intellectual Property ABS Specific Plan 1" issued by SZHTI was officially listed on the Shenzhen Stock Exchange. In 2020, the "Nanshan District-Zhongshan Securities-SZHTI Intellectual Property ABS Plan Phase I (Epidemic Prevention and Control)" was issued in Shenzhen, the "Pudong Science and Technology Innovation Intellectual Property Rights Asset Support Specific Program Phase I" was issued in Shanghai, and the "Yeda Zhirong-Yantai Development Zone Intellectual Property (Human Capital) Asset Support Program" was issued in Yantai. In 2021, the "Xingye Yuanrong-Wenzhou Technological Property ABS Plan" was issued in Wenzhou, the "Longhua District-Vanho Securities- SZHTI Intellectual Property ABS Specific Plan 1 (Digital Economy I)" was issued in Shenzhen, the "Longgang District-Ping An Securities-SZHTI Intellectual Property ABS Specific Plan 3" was issued in Shenzhen, the "Longhe Small Enterprise Loan ABS 2021-Phase IV" was issued in Taizhou, the "High-tech Zone IPRS of Medical Device Industry" was issued in Suzhou, the "China Technology Exchange-Beijing Zhongguancun Sci-tech Financing Guaranty Co., Ltd.-Yangtze River-Intellectual Property ABS Specific Plan Phase I" was issued in Beijing, the "China Securities-Zhongguancun Sci-tech Leasing ABS Specific Plan Phase II in 2021" was issued in Beijing. In 2022, the "Yeda Zhirong-Yantai Development Zone Intellectual Property ABS Specific Plan 1" was issued in Shanghai, the "Dongguan-Rongtong Finance Leasing -PingAn Securities- Sci-tech Intellectual Property Asset Support Program Phase 1 (Talent Demonstration Site Special Session)" was issued in Dongguan, the "Taizhou-Pufa Medical Loan IPRS Product" was launched in Taizhou, the "China technology Exchange-Beijing Zhongguancun Sci-tech Financing Guaranty Co., Ltd.-Yangtze River-Intellectual Property ABS Specific Plan Phase II" was issued in Beijing, the "Taihu Bay Science and Technology Innovation Belt Binhu Intellectual Property ABS Specific Plan 2" was issued in Wuxi, the "Shenzhen Yirui Investment Development Co., Ltd. Directional Asset-backed Notes (ABN) Phase II in 2022" was established in Shenzhen, the "Tianjin Bank-Bohai Chemical Industry Group Co., Ltd.-Binhai New Zone Directional ABN Phase I (Science and Technology Innovation Notes)" was issued in Tianjin. By the end of 2022, China had issued 86 IPRS products and raised 21.6 billion yuan for enterprises.

China's IPRS is mainly driven by the government. It is because of the active action of the CNIPA and

other government departments that China's IPRS has developed rapidly in recent years. China mainly adopted following four models: the Intellectual Property Rights Finance Leasing Securitization Model, the Intellectual Property Rights License Fee Securitization Model, the Intellectual Property Pledge and Loan Securitization Model, and the Two Times License Securitization model. IPRS interest rates start at 3.3% and peak at 5.3%. Through IPRS, enterprises can obtain bank loans or developmental funds, investors can get revenue income from bonds, service providers can get service fees, and the local governments can finish the assigned tasks.

### 3. Research Design

#### 3.1. Research methodology

The case study method is an approach by which the researcher chooses one or several scenes as the object, systematically collects the data and the information, carries on thorough research, and uses it to discuss a certain phenomenon under the actual environment situation (Lu, 2013). The domestic and abroad IPRS cases have different securitization models. Therefore, a multi-case comparison method is appropriate for this article. The multi-case study method allows for cross-case comparison, which considers the similarities or differences between cases (Baxter and Jack, 2008). Moreover, the multi-case study can extract valuable information from cases, as it facilitates in-depth analysis of each case (Yin, 1994). The conclusions obtained from the multi-case study are universal and general (Ouyang, 2004).

#### 3.2. Case selection and description

Constructing theories from case studies is also empirically adequate (Liu *et al.*, 2020). Selecting cases is vital for constructing theories in case studies (Eisenhardt, 1989). Based on the matching between the research object and the research problem, three principles are considered in the case selection of this paper. First, the article selects representative cases. For example, the article selects the exemplary cases of trademark securitization in the USA, the experimental securitization cases involved in the trading in Japan, and the IPRS cases of technology in China. Second, the article selects the typical and pioneering cases in the industry regardless of their success or failure. For example, the article selects the first intellectual property rights transaction case in the world and the first patent securitization case in the USA, Japan, and China. Third, the IPRS case selection is supported by sufficient, accurate, comprehensive, and comparable information and data. The objective of this article is to put forward policy recommendations for the development of IPRS in China. Therefore, this article selects as many representative IPRS cases and Chinese IPRS cases as possible.

#### 3.3. Information collection

The IPRS cases selected by this article are shown in Table 1. This article collects information and data on IPRS cases, including intellectual property rights owners, obligees, originators, credit rating agencies and issuing scales. Information and data collection methods are based on the available investigation, such as business reports, websites, media coverage, articles, and books.

### 4. Comparative Research Based on the "Subject-Element-Process" Model

Basing on typical IPRS cases in China and several developed countries, this article constructs a three-

**Table 1**  
IPRS cases information and data.

Case Name	Year	Country	Type of IPRS	Case Significance
Bowie Bonds	1997	USA	Copyright	This case is the first IPRS transaction case in the world.
Yale University-Zerit Securitization	2000	USA	Patent	This case is the first patent license fee securitization case in the world.
Guess trademark license agreement securitization	2003	USA	Trademark	This case plays an exemplary role in the development of trademark securitization in the USA.
IPXI securitization	2013	USA	Patent	This case is the first ULR IPRS in the world.
Scalar securitization	2003	Japan	Patent	This case is the first case of patent securitization in Japan.
Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan	2018	China	Copyright	This case has achieved a zero breakthrough in China's IPRS.
CUL&TECHFLCO ABS Phase I	2018	China	Patent, Copyright, Trademark	This case is the first standardized IPRS product in China.
Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan	2019	China	Patent	This case is the first IPRS securitization product in China with all basic assets patents, which also achieved a zero breakthrough of IPRS in Guangdong province.
Ping An Securities-SZHTI Intellectual Property ABS Specific Plan 1	2019	China	Patent and Copyright	This case is the first intellectual property rights ABS product with small-sum loan creditors' rights as the underlying asset.
Pudong Science and Technology Innovation Intellectual Property Rights Assets Support Specific Program Phase I	2020	China	Patent	The case is the first epidemic prevention and control ABS project of intellectual property rights in China.
Nanshan District-Zhongshan Securities-SZHTI Intellectual Property ABS Plan Phase I	2020	China	Patent	This case is the first IPRS-specific plan for epidemic prevention and control in Shenzhen.
Yeda Zhirong-Yantai Development Zone Intellectual Property (Human Capital) Asset Support Program	2020	China	Patent	This case is the first IPRS-specific plan in Shandong and the first human capital asset-specific plan in China.
Longhua District-Vanho Securities-SZHTI Intellectual Property ABS Specific Plan 1 (Digital Economy I)	2021	China	Patent	This case is the first asset securitization product focusing on the digital economy in Shenzhen.
Xingye Yuanrong-Wenzhou Technological Property ABS Plan	2021	China	Patent	This case is the first securitization product based on entrusted loans in China.
Tianjin Bank-Bohai Chemical Industry Group Co., Ltd.-Binhai New Zone Directional ABN Phase I (Science and Technology Innovation Notes)	2022	China	Patent	This case is the first IPRS product of a state-owned enterprise in China, the first intellectual property rights ABN science and technology innovation notes in China, and the first IPRS project in Tianjin.
Shenzhen Yirui Investment Development Co., Ltd. Directional Asset-backed Notes (ABN) Phase II in 2022	2022	China	Patent	This case is the Agricultural Bank of China's first intellectual property rights ABN product.

dimension policy analysis model of the "subject-element-process" to conduct an IPRS policy analysis, as shown in Figure 1. The combination of processes and subjects reflects the establishment of various capacities to carry out IPRS. Processes and elements combination can be used to analyze IPRS policy

issues and make policy selections. The combination of subjects and elements forms the IPRS ecosystem. Integrating subjects, processes, and elements can uncover the problem and future policy development recommendations of IPRS.

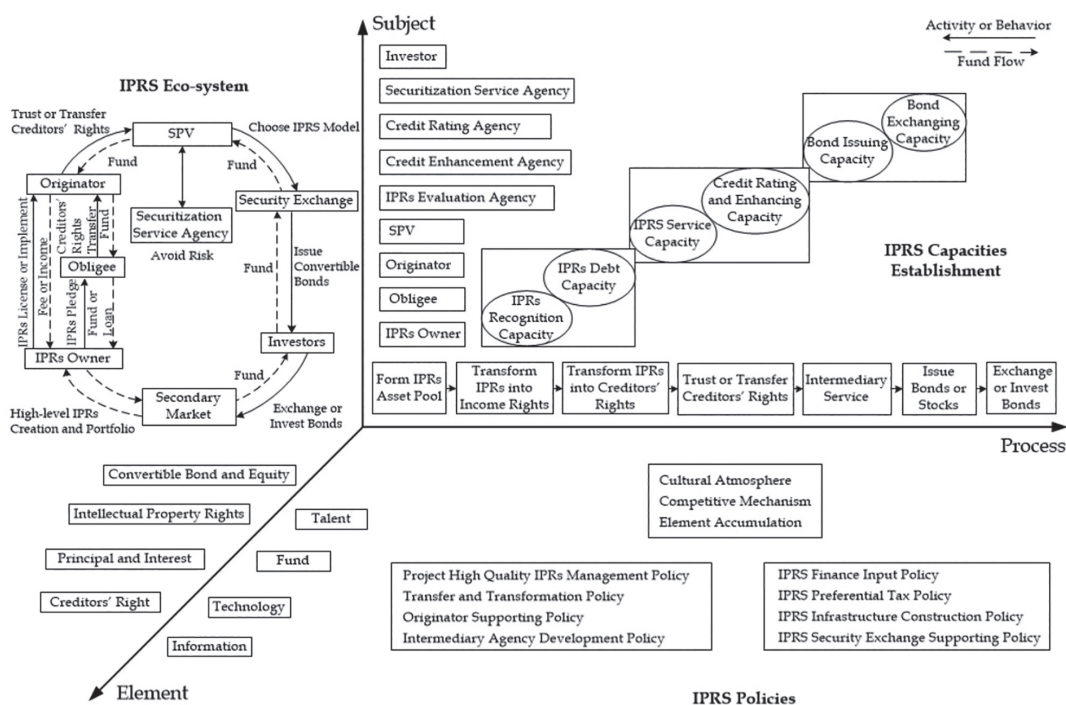


Fig. 1. The “subject-element-process” IPRS policy model.

#### 4.1. Subjects of IPRS

The subjects of IPRS mainly include intellectual property rights owners, obligees, originators, SPVs, intellectual property rights evaluation agencies, credit enhancement agencies, credit rating agencies, securitization service agencies, investors, and financial institutions.

(1) *Intellectual property rights owners*. Intellectual property rights owners are those who have high-value intellectual property rights and want to leverage them to obtain funds to expand their business scope. Owners can obtain funds by (1) transferring or trusting future licensing income to the originator, as in the cases of the IPXI and Scalar securitizations, (2) pledging their intellectual property rights to a bank, as in the Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan, and (3) transferring their intellectual property rights to a financing company, then releasing those right and paying the associated license fee. The CUL&TECHFLCO ABS Phase I, Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan, and the Yeda Zhirong-Yantai Development Zone Intellectual Property (Human Capital) Asset Support Program adopted such models.

(2) *Obligees*. Obligees are financial institutions, such as commercial banks and loan companies or finance leasing companies, that give funds or loans to the intellectual property rights owner and receive the creditors’ rights or the obligatory rights in turn. The loan funds are often less than 70% of the intellectual property rights value. These institutions can sell or trust the rights to the originator in exchange for loan recovery or transfer payments. The revenues can be annual principal and interest



for the loan of the pledged intellectual property rights, the second license fee of the finance leasing, or payments related to contract factoring. There are no obligees in the intellectual property rights license fee securitization cases.

(3) *Originators*. The originator is the initiator of the IPRS process. Most IPRS cases involved originators. The originator obtained the creditors' rights or obligatory rights to the future license income from the intellectual property rights owners, or the creditors' rights or obligatory rights to annual leasing fees from the finance leasing company, the future principal and interests from the bank, or the principal and interests associated with transferring or trusting the rights. For example, the originator of Bowie Bonds was the Prudential Securities Trust Company. The originator of Yale University-Zerit Securitization was Royalty Pharma Investment Co., Ltd. The originator of CUL&TECHFLCO ABS Phase I was CUL&TECHFLCO. The originator of the Pudong Science and Technology Innovation Intellectual Property Rights Assets Support Specific Program Phase I was Shanghai Puchuang Longke Finance Leasing Co., Ltd. The originator of the Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan was Guangzhou Kaide Finance Leasing Co., Ltd. The originator of PingAn Securities-SZHTI Intellectual Property ABS Specific Plan 1 and Nanshan District-Zhongshan Securities-SZHTI Intellectual Property ABS Plan Phase I was SZHTI Microfinance Co., Ltd. The originator transferred or trusted the rights to the SPV, and then the SPV issued bonds backed by intellectual property rights through credit enhancement or by offering bankruptcy remoteness. For example, the originator of the Yeda Zhirong-Yantai Development Zone Intellectual Property (Human Capital) Asset Support Program was Yantai Yeda Finance Leasing Co., Ltd. In some cases, there were no originators.

(4) *SPVs*. Most IPRS cases had SPVs. The SPV mainly includes special purpose trust (SPT), special purpose company (SPC), special purpose partner (SPP), and special purpose entity (SPE) models. An SPT is a special purpose trust model. The initiator sets up an SPT to set the underlying assets of intellectual property rights as the trust property, then transfers it to the trustee who then issues trust certificates to investors. This model uses the principle of independence of trust assets to complete the risk isolation of underlying assets. As SPC, the initiator sets up the SPC and transfers the ownership of the underlying assets to the SPC in a real sales manner. Then the SPC issues ABS to investors, and the funds raised are used as consideration for the purchase of the initiator's underlying assets. In the SPP model, the partner acquires the underlying assets of the originator and issues ABS. Investors purchase the securities and become partners, participate in the profits and assume the liabilities according to their capital contribution. An SPE is an ABS special program set up specifically by a securities company or a subsidiary of a fund management company to carry out securitization. The assets of SPEs are independent of the inherent properties of the originator, the manager, the custodian, and other business participants. The relationship between SPE and the security holders is "the form of trusted financing management", and it transfers the assets through signing the "asset sale contract" with the originator. Most IPRS cases set up SPVs. But Bowie Bonds wasn't set up an SPV. Yale University Royalty Pharma Investment Co., Ltd. established BioPharm Royalty, which was a type of SPT. In the Guess trademark license agreement securitization, an IP-holding limited partnership was set up.

(5) *Intellectual property rights evaluation agencies*. In the existing IPRS cases, external service agencies were used to assess intellectual property rights and their values. For example, IPXI determined ULR's price by conducting due diligence on related service agencies and potential bids, which was in line with the Dutch auction rule. Beijing Zhongjinhao Asset Evaluation Co., Ltd. and Zhongshui Deqing Asset Evaluation Co., Ltd. assessed most IPRS products' value in China. When evaluating the underlying assets

of the CUL&TECHFLCO ABS Phases I and the Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan, the technical level, maturity, market condition, economic benefit, investor protections industry status, and other elements were selected as evaluating indicators, and each was assigned a different weight. The values of intellectual property rights assets were generally determined on a weighted basis, and their price was typically evaluated by using the present value method of earnings.

(6) *Credit enhancement agencies*. The establishment of a credit enhancement agency is necessary for IPRS. For example, Yale University used 70% of the patent license fee as collateral. The first shortfall replenishment provided for CUL&TECHFLCO ABS Phase I was CUL&TECHFLCO, which subscribed to 100% of the secondary ABS bonds, accounting for 5% of the total value of the targeted ABS bonds. Beijing Cultural Development Investment Group Co., Ltd. was the second shortfall replenishment provider. In the Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan, China Securities Credit Promotion Co., Ltd. paid for the balance. The shortfall replenishment and liquidity providers for the Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan were Guangzhou Economic and Technological Development Zone Holdings Co., Ltd. The shortfall replenishment provider for the Pudong Science and Technology Innovation Intellectual Property Rights Asset Support Specific Program Phase I was Shanghai Pudong Science and Technology Innovation Group Co., Ltd. The shortfall replenishment provider for the Ping An Securities-SZHTI Intellectual Property ABS Specific Plan 1 and Nanshan District-Zhongshan Securities-SZHTI Intellectual Property ABS Plan Phase I was SZHTI.

(7) *Credit rating agencies*. China Chengxin Securities Rating Co., Ltd. was the credit rating agency of CUL&TECHFLCO ABS Phase I, which rated the bonds as priority A, priority B, and priority A3 levels. All bonds were rated as AAA level. United Credit Rating Co., Ltd. was the credit rating agency for the Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan. Priority A1 bonds were valued at 46 million yuan, priority A2 was valued at 400 million yuan, the subordinated bonds were valued at 24 million yuan, and Beijing IQIYI Co., Ltd. purchased the subordinated bonds. The Pudong Science and Technology Innovation Intellectual Property Rights Asset Support Specific Program Phase I was guaranteed by Shanghai Pudong Science and Technology Finance Guarantee Co., Ltd. to achieve credit enhancement by setting priority and subordinated bonds to principal and interest payments. Shanghai Pudong Science and Technology Financing Guarantee Co., Ltd. made royalty payments to patent clients, and Shanghai Pudong Innotek Group Co., Ltd. was responsible for shortfall replenishment. The Ping An Securities-SZHTI Intellectual Property ABS Specific Plan 1 and the Nanshan District-Zhongshan Securities-SZHTI Intellectual Property ABS Plan Phase I were guaranteed by SZHTI Finance Guarantee Co., Ltd., and priority and subordinated bonds were hierarchically designed and rated AAA level.

(8) *Securitization service agencies*. In above IPRS cases, besides the intellectual property rights evaluation agencies and credit rating agencies, there were IPRS service agencies. These service agencies include financial advisory service agencies, legal advisory agencies, accounting firms, custodian banks, regulatory agencies, and registration custodians. These service agencies were very important, however, they were often external service agencies.

(9) *Investors*. Anyone who meets any of the following conditions can become an investor in an IPRS in China: (1) financial institutions that have the approval of the relevant regulatory authorities, including securities companies, futures companies, fund management companies and their subsidiary companies, commercial banks, insurance companies, trust companies, financing companies, subsidiary companies of securities companies, subsidiary companies of futures companies, and private equity fund managers that have filed or registered with industry associations; (2) investors who purchase the financial products issued

by the above-mentioned institutions, including but not limited to, asset management products of securities companies, products of fund management companies and their subsidiaries, asset management products of futures companies, financial products of banks, insurance products, trust products and private funds filed by industry associations; (3) social security funds, corporate annuities and other pension funds, charity funds and other social welfare funds, Qualified Foreign Institutional Investors (QFII), and RMB Qualified Foreign Institutional Investors (RQFII); (4) legal persons or other organizations that simultaneously meet the following conditions: (a) net assets at the end of the most recent year are not less than 20 million yuan; (b) financial assets at the end of the most recent year are not less than 10 million yuan; (c) more than 2 years of investment experience in securities, funds, futures, gold, foreign exchange, *etc.*; (5) natural persons who simultaneously meet the following conditions: (a) financial assets are not less than 5 million yuan, or the average annual personal income for the last 3 years is not less than 500,000 yuan; (b) more than 2 years of investment experience in securities, funds, futures, gold, foreign exchange, *etc.*; (c) more than 2 years of financial product design, investment, risk management, and related work experience; (d) senior management composed of professional investors for financial institutions that have been approved by finance regulatory authorities, certified public accountants, and lawyers engaged in finance-related businesses and have professional qualifications; and (6) other investors who are recognized by the China Securities Regulatory Commission and the China Stock Exchange. The initial subscription amount shall not be less than 1 million yuan, and the amount of each additional subscription shall not be less than 100,000 yuan. Ordinary investors can only purchase these bonds in the secondary market one year after issuance.

#### 4.2. Elements of IPRS

Etzkowitz and Leydesdorff (2000) put forward the Triple Helix model of the national innovation system, which includes academia or universities, industry, and state or government. Based on it, Carayannis and Campbell (2009) put forward a Quadruple Helix model, the fourth helix of which is media-based and culture-based public and civil society. Furthermore, Carayannis and Campbell (2010) put forward the Quintuple Helix model, bringing in the fifth helix of the natural environments of society, and pointed out that the Quintuple Helix model was adequate for creating and supporting mid- and long-term sustainable development of society. Generally speaking, the elements of an IPRS system also include talent, capital, technology, information and policy, culture, *etc.* In this article, elements of IPRS mainly refer to intellectual property rights, creditors' rights, and bonds.

(1) *Intellectual property rights.* The intellectual property rights that can be capitalized include patent rights, trademark rights, copyrights, and their adjacent rights, which are mainly high-quality patent rights and their portfolios. The evaluation agencies generally are needed to assess the quality, risk, technology, market, management, and price of intellectual property rights. For example, in the second patent securitization by Zerit in the USA, the originator used 13 patents to form a patent pool as the underlying assets, which reduced the risk of insufficient cash flows of a single patent license (Borod, 2005).

(2) *Creditors' rights.* Intellectual property rights generating income is the premise of IPRS. That income can be the license fees generated by intellectual property rights. For example, the object of the IPXI IPRS was a unit patent licensing income right. The object of Yale University-Zerit Securitization was the patent licensing income rights generated by Zerit. The object of the Guess securitization was trademark licensing income rights. The object of the Philips IPRS was the licensing income rights of a portfolio of more than 600 patents of organic excitation light diode technology. The object of the Scalar securitization was the exclusive licensing income rights of 4 patents. The object of Columbia University securitization was

the licensing income rights of patent portfolios (which include 194 patents) of wireless communication network technologies. The object of the Xingye Yuanrong-Guangzhou Development Zone Patent License ABS Plan was the licensing income rights of 103 invention patents and 37 utility patents owned by 11 enterprises, including Huayin Medical, Jiade Environmental Protection, Ridal Biotechnology, and China Machinery Robotics. The object of the Pudong Science and Technology Innovation Intellectual Property Rights Asset Support Specific Program Phase I was the request rights to patent license fee payments and the rights to claim damages from other independent rights or ancillary guarantee rights for patent customers for 60 granted invention and utility patent licensing contracts for 9 enterprises. The object of Tianjin Bank-Bohai Chemical Industry Group Co., Ltd.-Bin Hai New Zone Directional ABN Phase I (Science and Technology Innovation Notes) was the licensing income rights of 68 high-value patents held by 6 national high-tech enterprises affiliated to Bohai Chemical Industry Group Co., Ltd. The income can also be the leasing or rental fee income received from intellectual property rights. For example, the object of Bowie Bonds was the rights to rental income generated by the sale of music copyrights. The object of the CUL&TECHFLCO ABS Phase I plan was 51 patent rights, copyrights, and other leasing contracts with 733 million yuan of outstanding principal rental claims and other ancillary security interests. The object of the Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan was the receivables generated by the copyright owned by the supplier purchased by Beijing IQIYI Science&Technology Co., Ltd. The income can also be the creditors' rights formed by the receivables associated with the intellectual property rights pledge loan. The object of the Yeda Zhirong-Yantai Development Zone Intellectual Property (Human Capital) Asset Support Program was the receivables formed by a 300 million yuan pledge financing for the rights to 182 patents owned by 16 enterprises. On the premise that intellectual property rights form income rights through the formation of specific and predictable cash flows, income rights can be transferred, sold, or trusted to an originator to be converted into creditors' rights. Intellectual property rights can only be securitized after they have been transformed into creditors' rights.

(3) *Bonds*. The most critical aspect of IPRS is the formation of marketable bonds. For example, the total value of Bowie Bonds was \$55 million, with a 10-year maturity and a 7.9% interest rate. The value of CUL&TECHFLCO ABS Phase I bonds was 733 million yuan; priority ABS A1 was 310 million yuan, with a 5.1% interest rate and a 3-quarter maturity. The value of priority ABS A2 was 275 million yuan, with a 5.4% interest rate and a 1.75-year maturity. Its priority ABS A3 was 111 million yuan, with a 5.5% interest rate and a maturity of 2.5 years. The subordinated ABS was valued at 37 million yuan, with a maturity of 2.5 years. All of the above IPRS bonds were rated AAA levels. The Qiyi Century Intellectual Property Supply Chain Finance ABS Specific Plan was worth 470 million yuan. The value of priority ABS A1 was 46 million yuan, with a 5% interest rate and one year maturity. The value of priority ABS A2 was 400 million yuan, with a 5.5% interest rate and a 2-year maturity. The subordinated ABS was worth 24 million yuan, with a maturity of 2 years. The Pudong Science and Technology Innovation Intellectual Property Rights Asset Support Specific Program Phase I was issued with three phases of bonds, with a total capacity of 1 billion yuan and a priority interest rate of 3.59%. Only after one year, the bonds could be sold in the secondary market. The ULR of IPXI was unit licensing rights, which were sold in the primary market. When the ULRs were not used up, they could be sold in the secondary market through market pricing and non-exclusive licensing agreements.

#### 4.3. *Process of IPRS*

IPRS is effectively a transformation way of rights in which intellectual property rights are transformed

into creditors' rights, and the creditors' rights are then transformed into bonds. In contrast to the rights transforming flow, this process also involves cash flow.

(1) *Transforming intellectual property rights into assets.* A precondition for IPRS is that intellectual property rights can be separated from the enterprise and be free of defects in terms of quality, technology, and risk. A prerequisite for their transformation into income rights and creditors' rights is that they constitute an asset portfolio.

(2) *Transforming intellectual property rights assets into income rights.* IPRS requires that intellectual property rights assets are able to generate income and the income must be stable, clear, and predictable. There are many situations in which intellectual property rights can be transformed into income rights, such as licensing rights, transferring or licensing to originators and leasing them back, pledging intellectual property rights to financial institutions for obtaining loans, and intellectual property rights contracts, such as assignment and commodity sales contracts.

(3) *Transforming income rights of intellectual property rights into creditors' rights.* IPRS requires transforming income rights into creditors' rights with a stable cash flow. The originators obtain the creditors' rights by paying the obligees or the intellectual property rights owners an agreed-upon amount of funds. The creditors' rights derive from income rights, which include transferring and licensing income rights, principal and interest receivable income rights generated by loans, rental income rights, and the receivables generated by intellectual property rights assignment and commodity sales contracts.

(4) *Trusting or transferring creditors' rights.* The originator trusts or transfers the creditors' rights to the SPV and then obtains the transfer or the trust disposal proceeds. The intellectual property rights owners can also transfer the intellectual property rights licensing proceeds to the SPV directly without an originator.

(5) *Bankruptcy remoteness and credit enhancement.* The SPV determines the amount and interest rate of the tiered bonds issued after considering the evaluation, bankruptcy remoteness, credit enhancement, and credit rating.

(6) *Bond and bond issuance.* The SPV issues bonds at a specific interest rate according to the trust agreement or the entrust financing management agreement. The interest rates range from 3.5% to 5.3%, and each participator can receive service income. For example, the originator can obtain about 2% of the total bond proceeds.

(7) *Bonds investment and exchange.* Investors invest in bonds in the primary market and sell the bonds on the secondary market to obtain the yearly investment income. The Shenzhen and Shanghai security exchanges now allow bonds to be exchanged on the secondary market after investing bonds for one year.

## 5. Problem Analysis of IPRS

### 5.1. Policies and regulations of IPRS

China regulated IPRS mainly through laws on company, property, guarantee, trust, securities, and securities investment funds. However, China has not issued specific laws of IPRS. Although the CPC Central Committee and the State Council of China required local governments to explore IPRS, there were few provisions relating to IPRS in the laws mentioned above. The absence of targeting IPRS laws will inevitably hinder its development and bring about practical risks.

The policies concerning IPRS in China mainly included the Interim Measures for the Supervision and Administration of Private Equity Funds, the Regulations on the Administration of Asset Securitization

Business of Subsidiaries of Securities Companies and Funds Management Companies, the Guidelines for Due Diligence of Asset Securitization Business of Subsidiaries of Securities Companies and Funds Management Companies, the Guidelines for the Information Disclosure of Asset Securitization Businesses of Securities Companies and Funds Management Companies' Subsidiaries, the Measures for the Administration of the Filing of ABS-Specific Programs, the Guidelines for the Adverse List for Fundamental Asset in the Asset Securitization Business, and the Guidelines for Risk Control in the Asset Securitization Business. The policies were mainly aimed at credit securitization. There is an absence of targeted policies for IPRS, which include product transactions, financing and taxation preferences, information disclosure, valuation, credit enhancement, risk isolation, bankruptcy liquidation, *etc.* The policies applied to IPRS were inadequate, especially those for intellectual property rights portfolio valuation, price valuation, and forms of guarantee and insurance. The service agencies' capabilities were also needed to be improved. In particular, many SPVs lack professional capabilities, and the software systems must be innovated effectively (Li, 2020).

The existing IPRS tax preferential policy in China was the Notice on Tax Policy Issues Concerning the Securitization of Credit Assets issued by the Ministry of Finance and the State Administration of Taxation in 2006. The policy stipulated that the stamp tax would not be levied on contracts signed by institutions, and business taxes (currently, the value-added tax) would not be applied to service, interest, and price difference income. However, there are few preferential tax policies for IPRS itself. At the same time, there are few preferential measures on the value-added and corporate income tax for IPRS.

Some local governments in China have formulated and issued policies supporting IPRS. For example, the Shenzhen Nanshan District government subsidized the Nanshan District-Zhongshan Securities-SZHTI Intellectual Property ABS Plan Phase I plan for up to 3.5% of the financing amount. The Hainan Intellectual Property Association paid the intermediary service fee to intellectual property rights credit rating agencies in advance. However, the government fund risk pools paid most or all of the fees for intermediary services and a significant proportion of the interest on intellectual property mortgages or finance leasing. Therefore, this kind of policies aren't sustainable. The policy's supporting ways are also insufficient. The greatest challenge in IPRS is transforming intellectual property rights into creditors' rights, and the riskiest component is bankruptcy remoteness. The local governments lacked supporting policies for transforming intellectual property rights into creditors' rights and incentive mechanisms for credit enhancement agencies.

## 5.2. IPRS operational models

The current IPRS cases mainly adopted the existing credit asset securitization model without or seldom considering the particularities of IPRS. As such, IPRS suffers from the following problems.

(1) *The eligibility of intellectual property rights as underlying assets was insufficient.* Intellectual property rights are intangible assets entirely different from other kinds of intangible assets. The creditors' rights derived from intellectual property rights can be handed over to SPVs as underlying assets through trusts, transfers, or other channels, but in such cases, the originator couldn't generate interest income. Intellectual property rights can be depreciated anytime, and an annual fee must be paid yearly. Even in the case of IPXI, where the transaction took several weeks, and the due diligence consumed a lot of time, there was no way to avoid the risk of intellectual property rights devaluation. Intellectual property rights must generate stable cash flows as core assets before becoming the underlying assets in securitization. However, it is difficult to evaluate the price. The capitalization possibility of intellectual property rights is

perhaps low. Although intellectual property rights can form stable cash flow through assignment, leasing, pledging, factoring, licensing and implementation, equity investing, and transferring licensing proceeds. However, the licensing income rights, and the creditors' rights transformed by pledging, factoring, and leasing are also difficult to evaluate and transform into bonds.

(2) *The bankruptcy remoteness mechanism of IPRS was insufficient.* Most IPRS cases abroad adopted the SPT model, while most cases in China adopted the SPE model. Evidence had proved that SPT could play a better role in bankruptcy remoteness by issuing bonds or securities to investors. SPE requires the manager to purchase bonds from the originator, thereby establishing an entrusting financial transaction relationship with the investor. This model can achieve bankruptcy remoteness, but it can only issue bonds. Given that the purpose of an investment is neither the use of intellectual property rights nor the generation of speculative profit, the investor will not be enthusiastic about such projects. IPXI didn't have a bankruptcy remoteness institution and the investors owned a ULR usage right instead. Although enterprises could purchase any ULRs, they generally don't actively purchase ULRs until they were prosecuted. It is the main reason for IPXI's failure.

(3) *Intellectual property rights service agencies were external institutions.* Inaccuracies in assessing intellectual property rights' quality, risk, market, and price are prominent issues. All SPVs established by managers employed external service agencies to identify and assess risk, and third-party institutions conducted the due diligence of IPXI affiliate members. The inaccurate valuation was one of the main reasons for its failure. In the IPRS cases in China, external intermediary agencies also assessed the prices of intellectual property rights assets. Evidence had proved that it is difficult for external service agencies to take responsibility for assessing IPRS. At the same time, unscientific methods for intellectual property rights valuation made it challenging to determine the prices of intellectual property rights assets reasonably.

(4) *There were many restrictions on IPRS investors.* IPXI's ULR model aimed to avoid the high transaction costs associated with negotiations for standard essential patents. The investors eligible to purchase ULRs were limited to enterprises that produce patented products, so fewer potential investors existed. The unused ULRs could be sold on the secondary market, but there wasn't liquidity due to a shortage of qualified investors. IPRS investors in China had mainly been limited to qualified investment institutions that could meet a high standard, and natural persons were excluded from the primary market. Evidence had shown that investments made by natural persons were important foundations for the healthy functioning of public markets. In addition, IPRS in China mainly adopted the SPE model. Thus, investors could only invest in bonds backed by intellectual property rights assets at a fixed interest rate. Furthermore, the interest rates on those bonds were relatively high because of the high intermediary service fees, which discourage investment.

(5) *Investor enthusiasm remained low.* The Wuhan Intellectual Property Exchange had tried the bonds and equity convertible model which could reduce risk but only applied to private equities in the regional equity market. Most current IPRS cases adopted an issuance model similar to that of debt, which took the creditors' rights of payments repayable on a mortgage loan of intellectual property rights as the underlying assets. Investors in China could invest in IPRS bonds but couldn't become shareholders. If the IPRS fails, the investors would bear all the losses. Investors could only purchase bonds at the prescribed interest rate, with their future income unrelated to implementing the intellectual property rights. Investors couldn't claim rights on the future cash flow of the intellectual property rights implementation, nor could they exert effective positive incentives and negative constraints on the enterprises.

(6) *The security exchanges hadn't played their roles adequately.* One of the main reasons for the IPXI failure was the platform's no-litigation target and overtop threshold led to too few patents listed (Li, 2016). IPXI served the functions of price discovery and transaction matching. In the case of IPXI, investors had the right to use ULRs after the purchase had been finalized, could purchase a sufficient amount of ULRs to meet production and sales needs, and could sell superfluous ULRs in the secondary market. However, enterprises generally don't voluntarily engage in such purchases until they were prosecuted. The SPT and SPE models issued bonds at a fixed interest rate, and the security exchange hadn't enabled continuous price discovery and transaction matching in the open market. In other words, the security exchanges hadn't fully fulfilled their role.

(7) *Lacked measures to compensate for IPRS failure.* Most Stock Offering Description of Chinese IPRS Cases stipulated the procedures for asset liquidity in the event of IPRS failure. Such liquidity was mainly carried out internally. There were unique auction platforms for foreign IPRS failures, such as Ocean Tomo in the USA, which auctioned the failed cases' intellectual property rights and effectively reduced the loss caused by the IPRS failure. In China, the risk isolation mechanism in IPRS was relatively complete. However, investors had to bear higher costs in the event of an IPRS failure, and the investors' enthusiasm for securitization would inevitably be affected. Furthermore, the SPVs, guarantee agencies, evaluation agencies, and custodian agencies might not receive service fees. After IPRS failure, there was no direct channel to auction intellectual property rights or take remedial measures. Many local governments in China had established intellectual property rights risk fund pools to guide, guarantee and even compensate for losses and subsidize the service fee of IPRS. But they had paid no attention to intellectual property rights auctions. In some regions, loss compensation and service fee subsidies could account for as much as 70% of the total bond issue cost. Although such measures might be suitable for the IPRS. But they were unsustainable.

### 5.3. Valuation of IPRS

The main reasons for the failure of the Zerit patent securitization were the inaccurate evaluation and improper handling by the licensor (Borod, 2005). The evaluation was also one of the main reasons for the failure of IPXI (Steele, 2017). Currently, intellectual property rights evaluation generally used the Income Present Value Method. This method can be applied to the evaluation of intellectual property rights implementation or licensing income and the valuation of the creditors' rights formed by transferred, leased, or pledged intellectual property rights. Most Chinese IPRS cases were valued by selecting the technical level, maturity, market conditions, economic benefit, investor protection, industry status, and other factors as indicators that were assigned different weights. However, this system wasn't reasonable, especially since the stability and certainty of the patent rights hadn't been included. The Income Present Value Method was a method for evaluating intellectual property rights by estimating the net profit, calculation period, rate of risk return on investment, and technical sharing rate. This method was also unreasonable because the calculation period was not the actual life of the project, nor was the intellectual property rights protection period. The rate of risk-return on intellectual property rights in the discount rate was non-linear. The technical sharing rate couldn't be used to evaluate intellectual property rights because there were other types of intellectual property rights, such as copyrights and trademarks. Thus, the evaluation of IPRS didn't conform to market standards. IPXI determined its price through due diligence and through early bids using the Dutch auction rule, but it could not calculate the ULR price of the embedded products or monitor the total number of ULRs sold (Steele, 2017). In addition,



the ULR market was not competitive. It wasn't easy to value the prices of intellectual property rights assets accurately and for credit enhancement to bring the credit rating up to standard. In China, the price of intellectual property rights assets was mainly given by evaluation agencies, as there was no price formation mechanism via market supply and demand. IPRS products were mainly bonds, so the public market didn't play a role in price discovery.

The small number and low prices of intellectual property rights will seriously affect the development of IPRS. In 2015, the average transaction price for each patent in the USA was \$250,000, while the average license price in China was only about 970,000 yuan in the 13th Five-Year Plan Period. According to the patent rights pledge loan data published by the CNIPA, the average pledge loan in China per patent right in 2020 was 3.24 million yuan, but the average patent pledge loan through IPRS was 10 million yuan. In 2017, each Chinese high-tech enterprise only applied for 6.99 patents and 3.69 invention patents on average and owned only 13.27 invention patents in force. Based on the average licensing price of invention patent rights, the average value of invention patent rights owned by each high-tech enterprise was only 13.3 million yuan. However, each patent of IPRS cases in China could get a loan about 10 million yuan. Moreover, it is well known that the quality of intellectual property rights of most high-tech SMEs was low. There are huge risks to China's IPRS.

#### *5.4. Investment objectives of IPRS*

Most IPRS investors were finance institutions such as securities companies, futures companies, fund management companies, and their subsidiary companies, commercial banks, insurance companies, trust companies, finance companies, private equity funds, social security funds, and charity funds. Most of these institutions were not experts in intellectual property rights.

It is difficult for these institutions to meet the requirements for IPRS investment. Article 29 of the Provisions on the Administration of Asset Securitization Business of Securities Companies and Fund Subsidiaries stipulates that ABS shall be issued to qualified investors, and the number of issuance targets shall not exceed 200. A single securities issuance of par value or the equivalent must not be less than 1 million yuan. Qualified investors in private equity funds stipulated in the Interim Measures for Supervision and Administration of Private Investment Funds are legal persons and natural persons who have adequate risk identification and risk-taking abilities. The investment amount of a single private equity fund must not be less than 1 million yuan and must meet the following standards: the personal legal entity shall own net assets of no less than 10 million yuan. The natural person shall hold financial assets of no less than 3 million yuan or earn an average annual income of not less than 500,000 yuan over the last three years. Article 38 of the Provisions stipulates that the issuing par value or the equivalent of the initially listed exchange unit of ABS shall be no less than 1 million yuan. These conditions are difficult for many IPRS projects to meet.

The open market is an important channel for obtaining IPRS finance. The purpose of IPRS for investors is to get revenue through purchasing bonds on the open market. If the thresholds and restrictions in the primary market are too stringent, the number of investors in IPRS may decline, and the IPRS will not be successful. At present, there is no preferential tax preferential policy for IPRS in China.

## **6. IPRS Model Design**

Based on the above analysis, IPRS in China still has ample development space. IPRS is a new form

of traditional securitization, which is different from traditional securitization in its overall structure and process. There is a large number of IPRS experiences around the world that can be used as a reference for China, whether successful or failed. To promote the continued development of IPRS in China, it is necessary to address certain issues, such as the IPRS route, intellectual property rights asset evaluation, bankruptcy remoteness mechanism, open market bidding procedures, investor requirements, *etc.* Therefore, this article proposes the following measures for IPRS development.

(1) *Expand the range of IPRS objects.* The underlying IPRS assets shall not only include the creditors' rights tied to intellectual property rights leasing, pledging, and licensing, but also the factoring right of intellectual property right product sales contract, future profit resulting from the implementation, and the future equity income derived from investing in intellectual property rights. Specific methods can be designed to allow intellectual property rights owners to transfer assets to originators to obtain exclusive rights. The originator can transfer or trust the assets to an SPV to obtain bankruptcy remoteness after they obtain the creditors' rights from the obligees or owners. Since the transfer price of intellectual property rights is generally low, it is possible to explore bundling intellectual property rights assets with other assets such as corporate real estate, equity, accounts receivable, land using rights, *etc.*, in the form of convertible bonds and equities. Stable cash flows can be formed by implementing intellectual property rights, factoring besides assigning, licensing, pledging, and leasing intellectual property rights.

(2) *Decrease the risk of intellectual property rights assets.* The premise of IPRS is the capitalization of intellectual property rights. Thus, intellectual property rights especially patent rights shall be held in a portfolio. Intellectual property rights can effectively protect leading products. So, intellectual property rights owners are needed to provide qualified analysis reports. The IPRS underlying assets must be high quality, technologically advanced, and highly valued intellectual property rights. Start-up technology-based enterprises can use the creditors' rights derived from high-value intellectual property rights portfolios to conduct IPRS.

(3) *Improve the methods and mechanisms for intellectual property rights asset evaluation.* In order to evaluate intellectual property rights assets, the first step is to evaluate the value of the intellectual property rights, especially in terms of their quality, technological sophistication, marketability, and management. The prerequisite for evaluating the maturity and sophistication of technology is that intellectual property rights must be stable, predictable, and high quality. The prerequisite of evaluating the market value and management team is that the intellectual property rights be high quality and technologically feasible. The prerequisites for evaluating intellectual property rights are that the rights must be high value and that the management of the enterprise or project is normative. When evaluating intellectual property rights, especially using the Income Present Value Method, it shall be noted that the calculation period is the entire life cycle of the products that generate income during the protection period. The rate of risk-return of intellectual property rights is high in the implementation periods and low in the production periods. If the rate of risk-return is too high, there is no need to evaluate the intellectual property rights assets. Thus, evaluating intellectual property rights assets can use cash flows and technological, financial, and management elements.

(4) *Establish internal intellectual property rights service agencies in SPVs.* Enterprises with better performance can adopt the ABS model. Official policies shall allow them to implement the ABS model by combining SPT and SPE to form a comprehensive bankruptcy remoteness mechanism such that the bankruptcy remoteness function of SPE and the investment function of SPT products can be leveraged at the same time. In the meantime, the manager of the securities company should establish an internal

intellectual property rights service agency in an SPV to solve the problems of information asymmetry, risk asymmetry, and high service fees. Such agencies can use scientific methods and mechanisms, conduct feasibility research on securitized products, and provide independent assessment reports. The securitized product design team can establish a cooperation and restraint mechanism with the intellectual property rights service team.

(5) *Lower the threshold for IPRS bond investment.* The range of investors for IPRS can be expanded through pilot projects. Aside from financial institutions and funds, venture capital, technology transfer, and intellectual property rights operation institutions can be allowed to become investors. Natural persons with the requisite qualifications or ability can also be allowed to invest in IPRS bonds. For example, according to existing regulations, natural persons who invest in IPRS shall have experience in technology transfer and obtain the qualifications of a patent agent, patent lawyer, technology transfer manager, or technology broker. The minimum investment made by a natural person shall not be less than 100,000 yuan, and the total number of such natural persons investing in the same project shall not exceed 200. The thresholds for institutional investors can also be lowered. For example, the threshold for institutional investors can be decreased to 300,000 yuan, and the number of institutional investors can be lowered to 100.

(6) *Improve IPRS products.* Capable intellectual property rights exchanges shall be encouraged to transform into IPXI model's ULRs into fixed-licensing fee patent pools. Enterprises that contribute standard essential patents to the patent pool can obtain licensing income based on the number of ULRs formed by its standard essential patents. Enterprises using patents in the standard essential patent pool must purchase a sufficient number of ULRs licensed for production and operation. This can be ensured by establishing a branch of the intellectual property court or the administrative enforcement office at the exchange. The ULRs can also be transformed into creditors' rights to enable the issuance of bonds as well as their trading on the security exchanges. Policies shall allow SPVs to develop convertible bonds and equity products, especially when intellectual property rights assets are combined with other assets. If a project is implemented well, investors can become shareholders. If there are risks, investors can become creditors, and the project can be guaranteed by the guarantee agency and the government's risk funds pool. Policies shall encourage the establishment of intellectual property rights auction markets in intellectual property rights exchanges, technology exchanges, and regional equity exchange marketplaces. Investors can be repaid a certain percentage in advance through an open auction if the IPRS fails.

(7) *Reduce IPRS expenses.* First, it is necessary to establish a long-term and close cooperative relationship between the securities enterprises and the service agencies to reduce service fees. Second, the intellectual property rights service agencies can be transformed into internal agencies to reduce service fees, or convert services into securities or shares that are restricted for a certain period. Third, the role of the venture capital pool established by the government shall be fully utilized. The government fund guarantee pool can be allowed to advance no more than 50% of the IPRS service fees, such as valuation, trust, rating, guarantee, custody, etc.

(8) *Formulate preferential tax policies for IPRS.* In order to encourage the continued development of IPRS, preferential tax policies for IPRS can be incorporated into the category of preferential tax policies for the transformation of scientific and technological achievements. The value-added tax (VAT) on income such as property transfer, license fee, price difference, and other related income shall be recognized as technology transfer income and be exempted. The corporate income tax shall be exempted from originators, SPVs, and institutional investors whose annual income is less than 20 million yuan (annual income includes transfer and licensing fees, trading commissions, bond interest, capital gains, and

other service fees). If their income exceeds 20 million yuan, the corporate income tax rate on the excess earnings shall be halved. Natural persons who invest in bonds shall be temporarily exempted from individual income tax. The equity formed by private equity funds investing in IPRS shall be allowed to take advantage of the deferred taxation policy for equity investments in technology. Due to the small amount of IPRS, the stamp duty on the transfer contract documents used for intellectual property rights and creditors' rights shall be decreased to 5 in 10,000 according to the new Law on Stamp Duty or be exempted.

(9) *Enhancing the function of the government.* Local governments can establish or enhance intellectual property rights commercialization risk fund pools and work with insurance companies to reduce the risks of IPRS. The orientation of the government's risk fund pools can be changed from direct loss compensation to guidance, risk guarantee, and reward for IPRS. In order to prevent the problem of reverse elimination, the government risk funds pools should mainly subsidize hefty IPRS service fees. In addition to subsidizing such fees, the government can re-guarantee institutions and reward successful IPRS. Local governments can establish IPRS expert advisory agencies to assess the service quality used for local IPRS.

Based on the above analysis, this article proposes the below IPRS model. The model is shown in Figure 2.

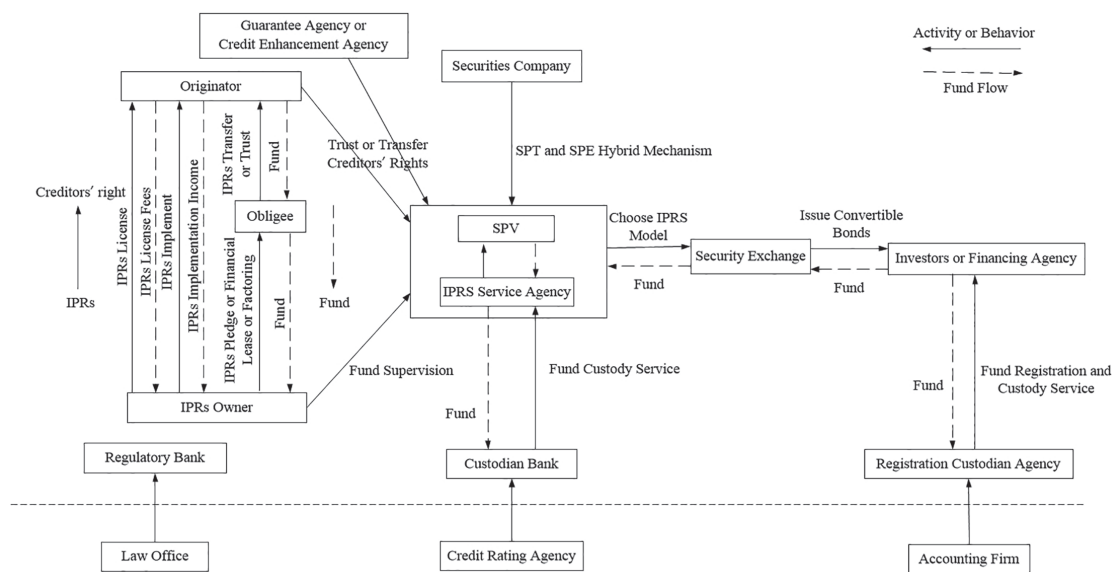


Fig. 2. IPRS model of convertible bond-equity and targeted raises.

## 7. Conclusion and Recommendations

The world is undergoing a significant change unseen in a century as a new scientific, technological and industrial revolution is gathering momentum. The competition to seize the opportunity of science, technology, and innovation, and integrate into the global value chain is becoming increasingly fierce. Intellectual property rights have become a core element of competition and a strategic resource for one country. China is now in a critical period of realizing great rejuvenation. It is urgent to implement innovation-driven development strategies to accelerate the construction of a modern economic system, promote high-quality development, and meet people's expectations for a better life. Accelerating IPRS

development is crucial to adapt to the new scientific and technological revolution and encouraging economic transformation. Expanding intellectual property rights investment and financing channels and promoting their use is also necessary. IPRS has significance for strengthening the country via enhanced intellectual property rights development.

Global IPRS cases provided a valuable reference for China's IPRS development. However, there is still a particular gap between practice and state requirements. China lacks specific laws and policies of IPRS, and there are still shortcomings in the existing IPRS model, such as overly complicated processes, high service fees, excessive restrictions, high risks, weak intermediary services, *etc.* The critical problem is that the model and mechanisms of IPRS are imperfect, the intermediary services are weak, and the policy support is insufficient.

Based on global IPRS cases, this article conducts a comparative IPRS case study, analyzes the problems in the existing cases, and designs IPRS models suitable for China. In order to promote China's IPRS development continuously, this article puts forward specific policy recommendations. First, it is necessary to formulate and issue IPRS laws and policies that put the creditors' rights securitization of the income of intellectual property rights implementation, the investment income to intellectual property rights, and the income of factoring into the IPRS category. Second, it is necessary to improve the existing evaluation methods. The big data online evaluation method that sales party A, purchasing party B, and the evaluator C participate simultaneously in intellectual property rights price is needed. Third, it is necessary to support the combination of SPT and SPE and establish an internal intellectual property rights service team to form a cooperative relationship with SPVs. Fourth, it is necessary to lower the threshold for investors, develop a new IPRS model in which bonds and equities can be convertible, and develop an auction mechanism in the event of IPRS failure. Fifth, it is necessary to stipulate the specific IPRS preferential taxation policies and encourage local governments to support IPRS. The preferential tax policies can be exempting the value-added tax and corporate income tax of property transfer income, license fee income, trading commission, bond transaction income, bond interest, and related service income, exempting participators whose income taxable is less than 20 million yuan from corporate income tax and half of the over part of participators whose income is more than 20 million yuan, and reducing the stamp duty on contract document tax rate to 5 in 100,000 and the certificate transfer to 0 in the process of IPRS according to the new Law on Stamp Duty. Finally, it is also necessary to lower the local government subsidy proportion for loan interests, service fees, and loss compensation for IPRS, and impose a reward policy for IPRS success.

## Acknowledgements

The authors are grateful to the reviewers for their valuable suggestions. This research was supported by the STS Project of "Chinese Academy of Sciences Intellectual Property Research and Training".

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