AN EMPIRICAL RESEARCH OF ASSET SECURITIZATION ON THE PEOPLE'S REPUBLIC OF CHINA'S FINANCIAL REFORM

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ABBREVIATIONS

ABS - Asset-Backed Securities

CBRC - China Banking Regulatory Commission

CFIA - China Fund Industry Association

CSRC - China Security Regulatory Commission

Ginnie Mae – Government National Mortgage Association

KaiDi - KaiDi Electric Power, Co .Ltd.

IAQS - Inter agency private placement quotation and service system

IPABS - Intellectual Property Asset-Backed Securities

R&D - Research and Development

SPV - Special Purpose Vehicle

SMEs - Small- and medium-scale enterprises

US - United States

RMB - Official currency symbol of the People's Republic of China

HEFEI - The Intermediate People's Court of Hefei Municipality, Anhui

ABSTRACT

Asset-backed securities (ABS) originated in the United States in the 1980s and began to be practiced in the Peoples Republic of China (China) from 2005. With the supply-side structural reform[1] after China's "four trillion[2]" RMB economic stimulus policy in 2008, China's asset securitization began to enter the stage of rapid expansion in 2014. By the end of June 2020, the value of China's asset securitization market reached 4.33 trillion (RMB). Previous studies on asset securitization are mostly based on the mature market environment of the United States and Europe. These studies focused on: i) the motivation and economic effect of bank loan securitization, ii) the “true sale” of underlying assets, iii) the bankruptcy remoteness of Special Purpose Vehicle (SPV), and iv) the investment risk side of securities. However, there is a significant study limit in the area of the influence of asset securitization as a structured financial instrument in the adjustment of economic structure and the reform of financial system of China.

This thesis comprises empirical research and the case study on the effects of asset securitization in China’s financial reform. The work is presented in four perspectives (hereinafter the FOUR).

Firstly, the thesis studies loan securitization. By using the Logit and Tobit model to

[1] At the end of 2015, the Chinese government put forward supply-side structural reform measures, namely "destocking, capacity reduction, deleveraging, cost reduction, and strengthening weak links". http://www.gov.cn/xinwen/2015-11/10/content_5006868.htm

[2] On November 9, 2008, the executive meeting of the State Council of China deployed ten measures to expand domestic demand and promote economic growth. By the end of 2010, the total investment scale reached four trillion (RMB). http://www.gov.cn/ztzl/kdnx/content_1143810.htm

study the data of 35 Chinese listed commercial banks from 2012 to 2019, factor analysis is used to summarize the information from various financial indicators that reveals banks' securitization determinants. The study conducted a sensitive analysis and a credit-deposit relationship estimation to examine the impacts of loan securitization. The analysis shows that the determinants of China’s banks’ securitization include cost advantage exploitation and performance promotion. The incentive of risk transfer involves risks from the stock market rather than non-performing loans. There is little evidence that loan securitization improves the income structure of banks nor even the investment efficiency of China’s financial market. On the other hand, the credit-deposit relationship of securitized banks is improved. This study argues that China's loan securitization market welcomes large banks with lower risks rather than small banks with higher risks. The default risk level of banks themselves rather than that of loan customers affect bank's securitization decision, mostly. Safe and high-yield spread business is still the best investment of loan securitization proceeds. It is the authors argument that the loan securitization market should be developed continuously and rapidly, which will have great implications on China's financial reform going forth.

Secondly, the thesis investigates determinants of asset securitization of non-financial enterprises under the background of supply-side structural reform, using 3,444 listed companies in the Shanghai and Shenzhen Stock Exchange from 2012 to 2017 as samples. Probit regression results show that determinants of asset securitization of non-financial enterprises are positively correlated with asset size and concentration of

accounts receivable, negatively correlated with R&D expenses, and concave with the asset liability ratio; ownership form does not affect the decision-making of enterprises, but the main credit rating has a significant effect on the decision of securitization, and it is concentrated in AA+ companies. The evidence leads the author to conclude that there are threshold and scale effects in securitizing firms. Specifically, small- and lower middle-scale credit rating companies are not often part of the asset securitization market. Securitization enterprises usually have less investment opportunities and short cash flows, so they may face financial difficulties. The motivation of asset securitization of AAA enterprises is to reduce leverage, when possible. There are restrictions on the issuance of corporate securitization debt by the unsecured creditors, but the strength is weak.

Thirdly, the thesis examines the “true sale” effect of SPV in China's asset securitization market. Using a single case analysis, it discusses a legal lawsuit of the securitization of KaiDi Power Charging Right that was court filed in June 2015. The Intermediate People's Court of Hefei Municipality, Anhui, concluded that the identification standard of the legal provisions of “true sale” of underlying assets in China is yet developing. Additionally, it also assessed the financial situation of the originator and its parent company to determine the deeper reasons behind the KaiDi Power incident. The Court determined that whether the underlying assets are “true sale” or not is based on the legal contracts, rather than the accounts where the cash flows are; the phenomenon of "capital confusion" in the securitization of charge rights is

one of the reasons affecting the “true sale”. The Court concluded that “true sale” still has legal obstacles in China. The possible contributions of the study are as follows: first, it studies the first court case of “true sale”, which has a demonstrative effect on the development of asset securitization market in China, and . second, it analyzes the power charging right, which is the legal criterion for the “true sale” of ABS issued with future claims as the underlying assets.

Fourthly, the thesis investigates the selection strategy of the underlying assets of Intellectual Property Asset-Backed Securities (IPABS) and the current replication and promotion path in China. Using multi-case analysis and the research period from December 2015 to July 2020 (during which the practice of IPABS began to emerge in China and 10 IPABS products were successfully launched), the thesis selects Four of the 10 cases (which respectively represent a class of underlying assets), and conducts a comparative study. Firstly, it finds that the IPABS products are small in scale, short in term and highly credit rated, from the perspective of securities side. Secondly, this study revealed that the underlying assets are not intellectual property rights themselves, but their derivative rights, with higher asset concentration, stronger external credit enhancement and smaller cash flow coverage, from the perspective of assets end. Thirdly, this review also unveiled that the bottom assets are mostly intellectual property royalties with a strong guarantee. The study concludes that the "future claims" attribute of the intellectual property right permits the securitization to face the dilemma of the compliance of the underlying assets. The double SPV model constructs

compliance underlying assets with new standardized financial claims (SPV1), transforms "future claims" into "existing claims", and realizes the homogenization of intellectual property rights, so as to solve the compliance, scale and operational difficulties of IPABS, and help small- and medium-scale high-tech enterprises achieve financing.

To summarize the main findings of the thesis are that: 1) China’s loan securitization promotes banks’ performance and improves their credit-deposit relationship, but does not played a significant role in improving the income structure of banks and the investment efficiency of the financial market; 2) there are threshold and scale effects in securitizing firms as small- and lower middle-scale credit rating companies are not well received in the asset securitization market; 3) “true sale” still (by 2021) has legal obstacles in China, with executor future flow as the underlying assets, the cash flow of ABS is confused with that of originators, even if the “true sale” is achieved, ABS investors face a great risk of default on principal and interest payments; and 4) the dilemma of IPABS comes from intellectual property itself, that is, the "future claim" attribute of its right of use, while the purpose of underlying assets reconstruction is to achieve "compliance", and the essence is risk transfer.

Taken together, the evidence from the above Four studies suggests that commercial banks use asset securitization to release capital and non-financial enterprises use asset

securitization to realize financing and asset-light strategy. "Bankruptcy remoteness"[3] is the essence of asset securitization, but the market participants' understanding of "bankruptcy remoteness" needs to be improved, especially in China. The dilemma of IPABS comes from the facts that the underlying assets are future claims. The double SPV structure can reconstruct the underlying assets, disperse risks and resolve the dilemma.

This thesis contributes to a deeper understanding of the motives and consequent implications of securitization within China's financial reform. It also provides valuable conclusions, that is, to improve the current information disclosure of asset securitization and the legal level of SPV, and to reform the supervision of enterprises participating in securitization activities. China's financial reform is a huge, complex and far-reaching project, which requires the cooperation and efforts of the government and financial market in an all-round way. The asset securitization market should be developed continuously and rapidly, which is of great implications to China's financial reform, today and tomorrow.

[3] "Bankruptcy remoteness" is the main feature of the SPV in ABS structures, which is used to avoid the losses of investors caused by the bankruptcy of the originators. The use of SPVs reduces the number of bankrupt assets, thus reducing the cost of bankruptcy (Leland,2007).

1 INTRODUCTION

1.1 Introduction

China's asset securitization market began in 2005. It was paused by the government in 2008 because of the subprime crisis in the United States. The second start of the securitization market was in 2012, in order to coordinate China's "four trillion" (RMB) economic stimulus policies[4]. The implementation of the restart plan has led to overinvestment in China's economy, the accumulation of non-performing loans of commercial banks and the rapid growth of shadow banks[5] in the financial system. As of June 28, 2018, the China's asset securitization market has exceeded 2 trillion RMB. The role of asset securitization is to sell the projects with long term and low liquidity, and realize the future cash flow of these projects in advance. Then, the securitization proceeds will be invested in new projects, undertaking "*TENG LONG HUAN NIAO*" (to sell old assets and buy new ones using the ABS proceeds). Asset securitization can shorten the investment period, improve asset liquidity, replace debt financing, reduce financial risk, and help banks sell non-performing loans to realize the transfer of financial risks. From then on, ABS became a tool helping enterprises that are facing financial distress and short of money. Since 2014, China's asset securitization market has entered a phrase of fast development with a growth rate of 366% (Figure 1.1).

In May 2012, China restarted its asset securitization business with the People's Bank of China (Central bank) and the China Banking Regulatory Commission (CBRC)

[4] On November 9, 2008, the executive meeting of the State Council of China deployed ten measures to expand domestic demand and promote economic growth. By the end of 2010, the total investment scale reached four trillion (RMB). http://www.gov.cn/ztzl/kdnx/content_1143810.htm

[5] Drawing on the views of previous literature (李波等，2011；韩珣等，2020), this article defines shadow banking as follows. Shadow banking refers to those financial institutions and financial instruments that are outside the regulatory system of commercial banks and perform the functions of commercial banks.

stressing the importance of loan securitization in the market-oriented reform of China's banking industry[6]. In 2014, the CBRC launched a filing system (Filing System)[7] which simplified the issuing process of loan securitization, reduced the issuing time and made the issuing process easier, and thereby the issuance speed of loan securitization was greatly accelerated. With the introduction of the "Filing System", ABS business supervision has been changed from CBRC's[8] system that required prior approval of the "asset package" to China Fund Industry Association (CFIA)'s to adopt a negative list approach[9]. However, the government has not relaxed the regulatory caliber for small banks to issue loan securitization, and the loan securitization market does not welcome small banks with higher risks. As shown in Figure 1.1 and Table 1.1, in 2014, the annual growth rate of ABS issuance in the inter-bank market reached 1,018.88%. However, the growth rate began to decline after 2014, evidenced by lower growth rates in 2015 (43.85%) and 2016[10] (-3.64%). By the end of 2019, the total amount of loan securitization issuance in China was 3,710,180 million RMB. What is the decisive factor for the development of China's loan securitization market? Is it driven by policies or the demand of banks themselves? It is of great significance to the development of the asset securitization market, especially for market regulators, to study and understand the

[6] Before 2014, the issuance of loan securitization had to be approved by the CBRC in advance and in accordance with relevant laws and regulations ("Measures for the supervision and administration of pilot loan securitization business of financial institutions")(China Banking Regulatory Commission， No. 3 Order of 2005)（http://www.cbirc.gov.cn/cn/view/pages/ItemDetail.html?docId=1159&itemId=928&generaltype=0）. In addition to compliance inspection, it is also necessary to open the "asset package" and conduct substantive review on specific issuance plans one by one. This means that regulators are prudent and conservative in allowing securitization of bank loans, especially for small-scale banks.

[7] The "Filing System" is designed to change prior examination to post registration. Before the ABS issue, the regulatory authorities only conduct compliance inspection, they no longer open the product's packaging to "asset actual package containment". Accounting firms, law firms, rating agencies and other intermediary institutions provide the professional ratings on the issuance scheme of the securitization of the products and fully disclose the same to the investors.

[8] CBRC: The organization was reorganized as China Banking and Insurance Regulatory Commission (CBIRC) in 2018.

[9] The negative list system means that the regulatory authorities clearly list the types of underlying assets that are prohibited from securitization in the form of a list. The underlying assets beyond the negative list can be securitized.

[10] Although the growth rate of issuance slows down, the total amount of issuance is rising.

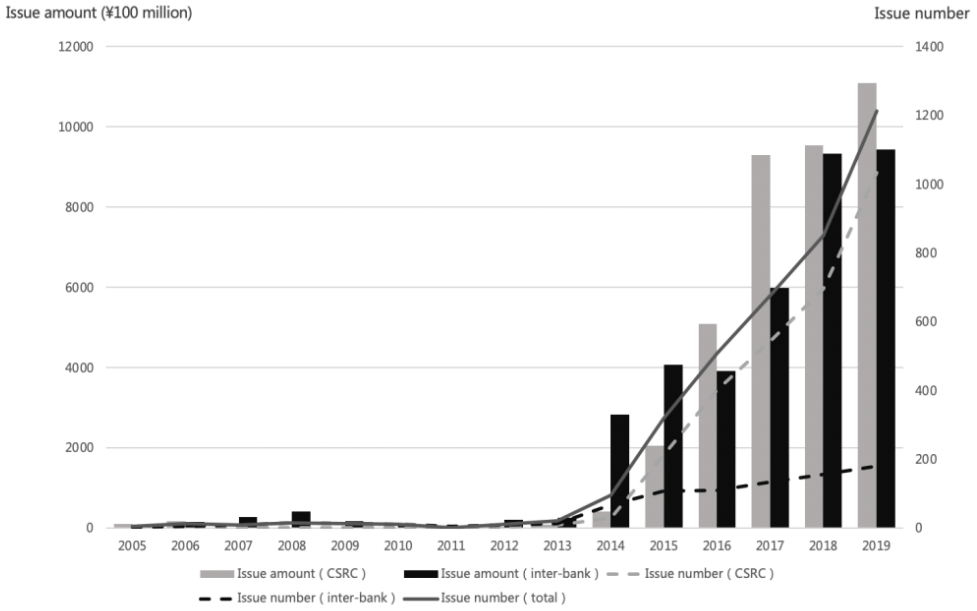
underlying reasons behind the phenomenon of accelerating and decelerating issuance within the loan securitization market? More importantly, as an important financial tool for supply-side structural reform[11], has China's asset securitization played a role in improving the income structure of banks and the efficiency of the financial market? (Figure1.2)

In China's financial market, in addition to the loan securitization in the interbank market, asset securitization also includes the enterprise asset securitization in the exchange market, whose originators are non-financial enterprises. The underlying assets of securitization include receivables, infrastructure charging rights, intellectual property rights, etc. The second revival of the securitization market is to coordinate China's "four trillion" RMB economic stimulus policies. In December 2015, the Central Economic Work Conference put forward a supply-side structural reform plan to cut overcapacity, reduce inventory, deleverage, reduce costs and strengthen weak links. Asset securitization, as an important financial innovation means to promote national economic reform, has been supported by policies and favored by the market. In 2017, the total issuance volume of the asset securitization market increased by 366% compared to 2014. However, the cost of issuing ABS is higher than that of bank loans and corporate bonds. In the exchange market, for example, ABS issues at about 6-7%, with a spread of about 3% over corporate bonds of the same maturity. This research revealed that the firm credit rating of non-financial enterprises issuing asset securitization is mostly concentrated in AA^+ and above. Enterprises with high credit rating do not lack financing opportunities from traditional channels, but rather choose the financing instruments of

[11] At the end of 2015, the Chinese government put forward supply-side structural reform measures, namely "destocking, capacity reduction, deleveraging, cost reduction, and strengthening weak links". http://www.gov.cn/xinwen/2015-11/10/content_5006868.htm

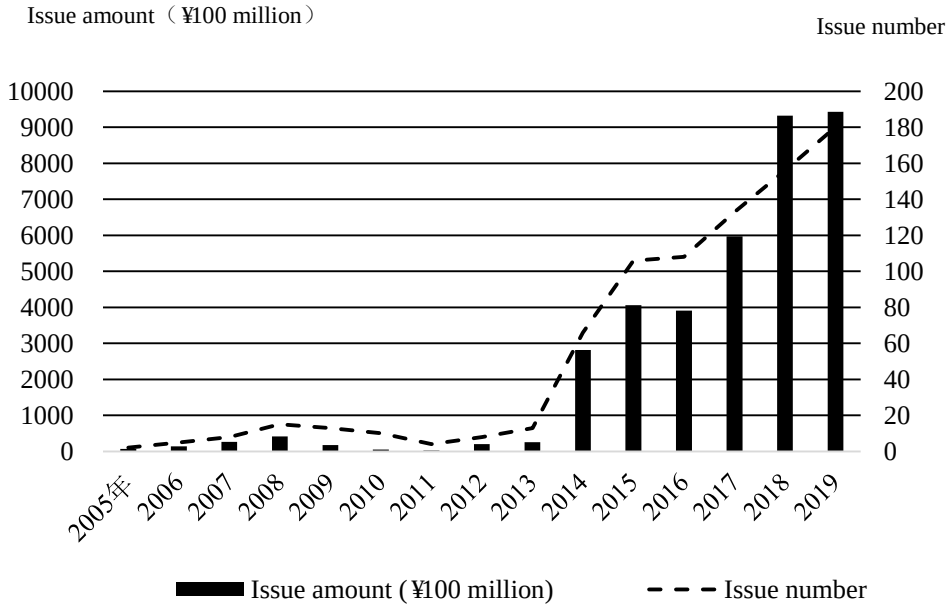
ABS with high cost, nonetheless. The reasons behind this situation are worth studying.

Figure 1.1 The Issuance Amount and Quantity of ABS Markets (￥million)



Source: WIND Note: The total issuance scale and quantity of China's ABS are scaled to the left and right axes respectively.

Figure 1.2 The Issuance of Inter-bank ABS from 2005 to 2019



Source: WIND; Note: The issuance scale and quantity of China's credit ABS are scaled to the left and right axes, respectively.

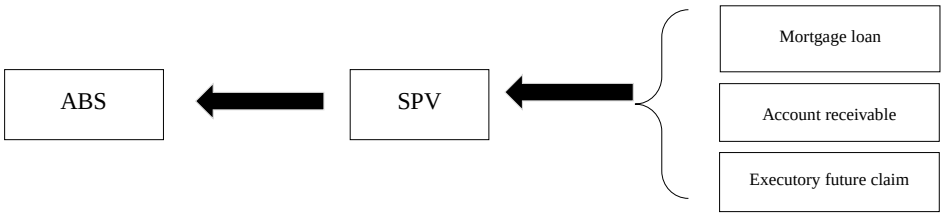
1.2 Theoretical Framework for the Research

1.2.1 The Structure and Process of Asset Securitization

In general, securitization can be defined as a structured process of firms converting traditionally illiquid assets held to maturity into marketable securities. A typical securitization transaction involves pooling homogeneous assets with predictable cash flows to form an asset pool. The assets in the pool are called underlying assets. The transfer of the underlying asset to a special purpose vehicle (SPV), an entity with "bankruptcy remoteness"[12] function, to finance the purchase of the underlying asset issues securities backed by the asset. In the most common cases, SPV grade pools assets according to risk, maturity, and other characteristics, with investment grade priority backed by a mezzanine level, which in turn is backed by an unrated sub-equity class. This tiered technology enables SPV to share credit risk and deliver it to those who are willing or most able to absorb it. In order to ensure that the rating agencies offer a high credit rating ABS, SPV will: 1) conduct credit enhancement, usually from the originator (a bank or other types of non-financial companies), 2) provided in various forms, from the balance payment commitments, 3) provide liquidity support, the third-party guarantees, and 4) provide a standby letter of credit, to purchase the most subprime securities issued by SPV. (Figure 1.3)

[12] "Bankruptcy remoteness" is the main feature of the SPV, which is used to avoid the losses of investors caused by the bankruptcy of the originators. The use of SPVs reduces the number of bankrupt assets, thus reducing the cost of bankruptcy(Leland,2007).

Figure 1.3 The structure of Asset Securitization



1.2.2 The Motivation of Firm's Asset Securitization

Loan securitization is an alternative to bank debt financing (Greenbaum and Thakor, 1987). Packaging loans into pools and subsequently selling them in layers may increase the value of loans (DeMarzo, 2005). Risk management of selling loans is the main driver behind loan securitization (Guo and Wu, 2014). The determinants of loan securitization are regulatory arbitrage, liquidity demand, risk transfer, profitability promotion demand and cost advantage exploitation (Minton et al., 2004; Martin-Oliver and Saurina, 2007; Bensalah and Fedhila, 2016; Zhang et al., 2018).

For non-financial enterprises, asset securitization can expand direct financing sources and reduce the dependence of enterprises and local governments on bank loans, reduce financial leverage and capital cost, adjust the structure of assets and realize the strategy of light assets（张明等，2013；朱荃等，2019）.

1.2.3 The Implication of Securitization in China's Financial Reform

The thesis takes "the logical road map for China's financial reform" as a theoretical framework to study "the implication of loan securitization to China's financial reform". As shown in Figure 1.4, the following can be stated.

(1) In the recent 40 years of reform and development of China, fixed asset investment has been the main driving force of economic growth. The financial system

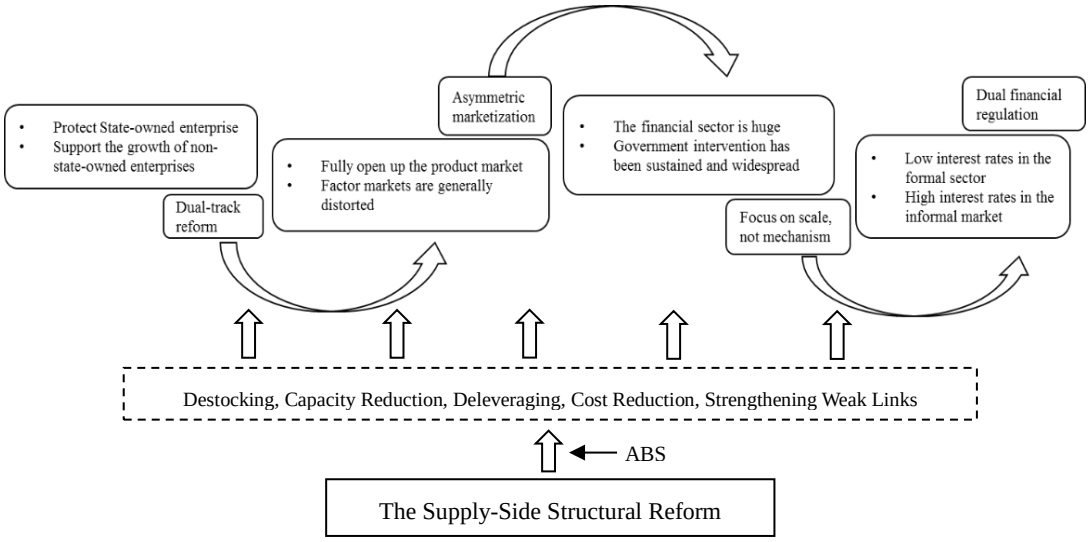
that has successfully supported factor driven growth in the past is now in urgent need of transformation. In recent years, the investment efficiency indicator ICOR (marginal capital output ratio) has increased significantly (from 3.5% in 1985 to 15% in 2017) indicating that China's capital or financial efficiency is declining. The result of the decline of financial efficiency is the increase of financial risk. Now, preventing systemic financial risks has become one of the major reform goals of the government (黄益平等, 2019). Securitization can help reduce the systematic financial risk of the banking system by converting long-term infrastructure loans into more effective financial assets.

(2) Through asset securitization, commercial banks convert illiquid loans into cash and then invest in other non-credit financial assets in order to obtain non-interest income (NIR). Asset securitization helps commercial banks reduce the proportion of credit assets so that they not only use credit instruments, but also rely on intermediate business operations, such as participating in the bond markets (treasury bonds, corporate bonds, ABS, etc.) (吴青, 1999; 沈炳熙, 2006).

(3) Asset securitization can also change the dependence of commercial banks on deposits and realize credit expansion. Excessive dependence on deposit financing will leave part of the credit demand unsatisfied, thus reducing economic efficiency. As a new source of capital for commercial banks, securitization can relax the tension between deposits and credit growth (Almazan, et al., 2015).

For these reasons, securitization could be beneficial to economies and financial markets, and has been embraced by many governments of developing countries. Nevertheless, the widely use of securitization is not without risks. On this regard, our empirical study on China’s practice might offer some useful insights to developing countries.

Figure 1.4 The Logical Road Map for China's Financial Reform



Source: Self arrangement

1.3 Objectives and Contributions

This thesis attempts to provide further insights into asset securitization and the role of asset securitization in China's financial reform. It comprises empirical work on securitization from the banks and non-financial firms, and case studies in perspectives of "true sale" and Intellectual Property Asset-Backed Securities (IPABS).

Firstly, the thesis aims to assess whether banks improve their performance through the use of the securitization under the market environment of China's financial reform. This study makes contributions to the existing literature in three ways. First, the reliability of data is higher. It uses open market data derived from the annual reports of 35 listed Chinese banks, audited by certified public accountants, with a high degree of reliability. Second, the study supplements the data used by Zhang et al. (2018) and adds

the years 2018-2019 data. Third, the essay discusses the mutual influence between asset securitization and China's financial reform, and conducts an empirical test from the perspective of banks and the market. Such a research perspective is rare.

Secondly, the thesis investigates three questions of securitization of non-financial enterprises: 1) under the background of supply-side structural reform, will the financial factors that affect the decision of enterprise asset securitization change?; 2) does the form of enterprise ownership affect its asset securitization decisions?; and 3) does the decision of asset securitization have specific credit rating characteristics? The possible contributions of this study include two points. First of all, factors to China's economic transformation and the development of the asset securitization market are considered. The research period is from 2012 to 2017, during which the Chinese government implemented the "four trillion" RMB economic stimulus plan and the supply-side structural reform policies characterized by the rapid development of the asset securitization market. The implementation of these policies is expected to have a significant impact on the decision-making of enterprise asset securitization going forth.

Secondly, the characteristics of the current ABS market are combined. Under the condition of the private market, risk preference of ABS “qualified investors”[13] is unique, and its influence on ABS issuance pricing, maturity, credit rating, liquidity and corporate governance will ultimately influence the asset securitization decisions of enterprises.

Thirdly, the thesis aims to examine the “true sale” effect of SPV in China's asset securitization market. The possible contributions of “true sale” are as follows. First, it

[13] Refers to investors conforming to the Interim Measures for the Supervision and Administration of Private Investment Funds.

studies the first court case of “true sale”, which has a demonstrative effect on the development of the asset securitization market in China thereafter; and second, it analyzes the utility revenue, which is the legal criterion for the “true sale” of ABS issued with future claims as the underlying assets.

Fourthly, the thesis selects strategies to investigate the underlying assets of IPABS and the current ways to replicate and promote these strategies in China. The possible contribution of the research is to use four representative IPABS products for multi-case analysis. The research analyze the existing obstacles of IPABS in China at present, and puts forward a model for the reconstruction of underlying assets, which provides a theoretical basis for the replication and promotion of IPABS in China.

1.4 Data

All the data in the empirical part of this study are market open data from WIND and CSMAR databases. The thesis looks at 35 listed banks from 2012 to 2019, and 3,444 non-financial listed companies from 2012 to 2017. Since the second restart of asset securitization in China was in 2012, and there were too few securitized products issued before then, the study began in 2012. In the research, most of the variables are the financial data of the originators. Subjected to the availability and reliability of the data, the research samples are only listed companies.

1.5 Empirical Study Design and Main Findings

In Chapter 4, based on data from 35 listed banks in China from 2012 to 2019, the study first evaluates whether bank loan securitization could gain economic benefits through liquidity demand, regulatory arbitrage, profitability promotion, risk transfer,

and cost advantage exploitation or not. The research uses factor analysis, the Logistic and Tobit panel regression model to verify the probability and quantity of bank's loan securitization. Secondly, the research verifies the mutual influence between bank's loan securitization and China's financial reform. The thesis carried out three robustness tests: 1) grouping by bank size (national banks and regional banks), 2) grouping by timeline (before and after the "Filing System"), and 3) replacing risk variables (Z-score and DtD). Sensitivity analysis is carried out by using the policy environment index of financial reform (variables of NIR and ICOR). The research also makes an estimation of the dependence of loans on deposits among securitized and non-securitized banks.

The study finds that among the hypothesis of the five determinants of China's loan securitization, only regulatory arbitrage and cost advantage exploitation are supported by the empirical results. The robustness test notices that large banks are incentivized to pursue cost advantage exploitation and small banks are more eager to improve their performance. The implementation of the "Filing System" results in the determinants of loan securitization arising from the commercial banks themselves instead of supervision. Substituting variables shows that listed commercial banks pay more attention to their overall risk from the stock market than non-performing loans. Banks with lower risks tend to securitize their loans. The result of sensitivity analysis is not significant but the directions are consistent with the previous hypothesis. The estimation result shows that deposit and credit is less intense after banks are able to securitize them but the effect is limited in small banks.

In Chapter 5, a Probit regression model is used to study the influencing factors of non-financial enterprises' securitization decisions under the background of supply-side

structural reform, and the robustness test is conducted for the sample asset size grouping according to the 10% quantile. It is found that the securitization decisions of Chinese non-financial enterprises are positively correlated with the asset scale and the concentration degree of receivables, negatively correlated with the investment of R&D expenses, and concave with the asset-liability ratio. The form of ownership does not affect the securitization decisions of enterprises, but the firm credit rating has a significant effect on the securitization decisions and focuses on AA^{+} companies.

In Chapter 6, a single case analysis is used. The case revives a legal litigation scene concerning the “true sale” in the future claim asset securitization of power charging right of a biomass power generation enterprise. The case has sorted out the market development of the securitization of toll right, the product elements of the charging right of ABS of KaiDi Electric Power, Co .Ltd. (KaiDi) the transaction structure diagram and the interest relationship among the three parties involved in the event. The case also analyzes the financial situation of the originators and its parent company to explore the deeper reasons behind the event. The study found that the underlying assets were “true sale” was based on legal contracts, rather than cash flows. The ubiquitous phenomenon of "capital confusion" in the securitization of charging rights is one of the reasons affecting the effect of "true sale". The poor financial situation of the originators and the insufficient source of raw materials for biomass power generation are other reasons for the occurrence of the event.

In Chapter 7, a multi-case analysis method is adopted to try to learn the differences of IPABS products in the selection of underlying assets, and an in-depth analysis is made, aiming to conclude the logic and path that can be copied and promoted. The

research period is from December 2015 to July 2020, during which the practice of IPABS begin to emerge in China's financial market and eleven IPABS products are successfully launched. Four cases are selected, which respectively represents a class of underlying assets. It is found that the dilemma of IPABS comes from the intellectual property itself. The underlying asset is not intellectual property but its derivative rights (license right). Most of the originators are small- and medium-scale enterprises. The characteristics of the underlying assets of IPABS determine that the cash flow of the underlying assets is mostly unstable. Reconstruction of underlying assets by using the double SPV model can make it possible to scale and replicate the IPABS in China.

1.6 Conclusion

In summarizing the main findings, firstly, the thesis concludes that China's loan securitization market welcomes large banks with lower risks rather than small-scale banks with higher risks. Default risks of banks themselves rather than that of loan risks affect bank's securitization decision the most. There is little evidence that loan securitization improves the income structure of banks and the investment efficiency of financial market. However, the credit-deposit relationship of securitized banks is really improved.

Secondly, the thesis suggests that non-financial enterprises are exposed to the threshold and the scale effect of asset securitization business, and that the securitization market does not welcome small-scale companies and those with medium and low credit ratings. Securitized companies typically have fewer investment opportunities and less cash flow, so they may face financial difficulties. The motive of asset securitization of AAA enterprises is to reduce leverage, and unsecured creditors have restrictions on the

issuance of corporate securitized debt, but the intensity is weak.

Thirdly, the thesis concludes that “true sale” still has legal obstacles to overcome in China. The legislative level of the regulations is relatively low. Some clauses in China’s Bankruptcy Law limit the realization of the ultimate goal of “bankruptcy remoteness” and “true sale” in assets securitization. For assets securitization with executor future flow as underlying assets, the effect of “true sale” depends on the operation ability of originators. Even if the “true sale” is achieved, ABS investors are also facing a great risk of default on the principal and interest payments. As an assets service provider, the originators can easily lead to confusion between his own and collecting funds. If the frequency of payment is too low, the recovery time is too long on the originator’s account, then there would be a significant delay in payment, and the originator may not be considered to have given up control of the underlying assets.

Fourthly, the thesis shows that the dilemma of IPABS comes from the intellectual property itself. Only when intellectual property is operated in combination with other resources can it generate income and cash flow. Only property rights to intellectual property (licensing rights) can be securitized. It is difficult for IPABS to achieve a large issuance scale. Diseconomies of scale will lead to higher issuance cost of IPABS than another asset securitization. Formatting the asset pool by the double SPV mode of “intellectual property + other types of assets + strong guarantee subject + assets mortgage”(SPV1), introducing financial institutions to produce intellectual property derivative rights (such as leasing claim, supply chain finance claim, petty loan claim, etc.) to reconstruct underlying asset, and finally finalizing the issuance of IPABS, may

be a current method and can be copied and promoted.

1.7 Outline of the Thesis

The remainder of the thesis is organized as follows. Chapter 2 presents background on securitization. First it provides a market overview including a brief history of its development. It then discusses in the definition and classification of underlying assets, and mechanism of credit enhancement.

Chapter 3 reviews the relevant literature on securitization. Specifically, it organizes the literature in three strands. The first part investigates the motivation and effect of asset securitization. The second part examines the choice of underlying assets of securitization. It focuses on the characteristics of two kinds of special underlying assets, including the securitization of charging right and intellectual property right. The third part discusses the financial market environment of asset securitization and examines the policy effect of asset securitization under the background of China's financial reform.

Chapter 4 and 5 contain the empirical analysis, and case studies of the thesis are presented in the subsequent chapters. Specifically, Chapter 4 presents the perspective on loan securitization under China’s financial reform. It attempts to evaluate whether banks improve their net return in terms of liquidity demand, regulatory arbitrage, profitability promotion, risk transfer, and cost advantage exploitation through the use of the securitization market. Moreover, the impact of bank securitization in financial reform will be tested.

Chapter 5 presents the perspective on influencing factors of asset securitization decision of non-financial enterprises. It investigates three aspects. First, under the

background of supply-side structural reform, will the financial factors that affect the decision of enterprise asset securitization change? Second, does the form of enterprise ownership affect its asset securitization decisions? Thirdly, does the decision of asset securitization have specific credit rating characteristics?

Chapter 6 presents the perspective on Chinese standards for “true sale” of power charging right securitization. It examines the legal effect of “true sale” under the condition of China's asset securitization market through a single case analysis.

Chapter 7 presents the fourth perspective on IPABS. It investigates the selection strategies of underlying assets and the current ways to replicate and promote the securitization of intellectual property rights in China.

Finally, Chapter 8 concludes the thesis. It summarizes the main findings and conclusions of the Four perspectives, discusses the contribution of the conducted analysis and suggests scope for future research.

2 BACKROUND ON ASSET SECURITIZATION

2.1 Brief History of Securitization

Securitization is a structure in which a special purpose vehicle (SPV) is created and securities collateralized by the SPV's asset are issued to the investors (Yamazaki, 2005). The most common types of securitized assets are mortgages, credit card receivables, automobile loans, student loans (US mainly) and equipment leases. Securitization began in the 1970s with the structured financing of mortgage loans by a US government-sponsored agency, the Government National Mortgage Association (Ginnie Mae). The securitization of non-mortgage assets began in March of 1985 in US when Sperry Corporation, a major American equipment and electronics company, issued $192.5 million of securities backed by computer lease receivables. (Minton et al.1997).

In August, 2005, China Unicom issued the first asset securitization product, "China Unicom CDMA network lease ABS" in Shanghai Stock Exchange, supported by the right of return on network lease. In December 2005, China Development Bank and China Construction Bank issued the first asset securitization products in the inter-bank market with the support of individual housing loans and credit assets, respectively. This marks the formal birth of asset securitization as a direct financing method in China's capital market (林华, 2015). As of December 31, 2020, China's asset securitization market has issued 6,101 ABS products, with a total issuance scale of nearly 10,633 billion RMB (和逸科技, 2020).

2.2 Definition and Classification of Underlying Assets

According to article eight of the “The Administrative Regulations No.49”, issued by China Securities Regulatory Commission (CSRC) in 2014, underlying assets is “…property rights or property that can be specifically defined, generate independent and predictable cash flows… It can be property rights such as enterprise receivables, credit assets, trust proceeds, infrastructure proceeds, commercial real estate, and other property or property rights recognized by the CSRC”. Therefore, most of the underlying assets are “property rights”, which mainly include “creditor’s rights” and “special assets income rights”, “property” only lists “commercial property” one item. “Special assets income rights”, for example, means a special asset management plan initiated with the right to charge for infrastructure such as hydropower, electricity, roads, bridges and tunnels as the underlying assets. In the process of assets securitization of such projects, the originator only transfers the income right of the assets to SPV, while the ownership of the underlying assets itself is not transferred.

From an accounting point of view, the underlying assets of securitization can be divided into two categories, namely "existing claims" and "future claims". "Existing claims" refers to the rights and obligations formed from past transactions and events. Such claims are recognized as "assets" by the accounting standards for business enterprises and included in the balance sheet of an enterprise. "Future claims" refer to rights and obligations that do not exist now but are expected to occur in the future. Such claims are not recognized as “assets” by accounting standards and are not included in the balance sheet of an enterprise. When the underlying assets are accounting "assets",

the "off-balance sheet"[14] assets may become the work of statement arbitrage for the originators, achieving earnings management and balance sheet window dressing. The asset securitization of "future creditor's rights" not only brings cash flow income to the originators, but also increases the balance of "liabilities" in accounting statements, thus increasing the leverage ratio of enterprises.

2.3 The Role of SPV

SPVs have no purpose other than the transaction(s) for which they were created, and they can make no substantive decisions; the rules governing them are set down in advance and carefully circumscribe their activities. Indeed, no one works at an SPV and it has no physical location. SPVs are essentially robot firms that have no employees, make no substantive economic decisions, have no physical location, and cannot go bankrupt (Gorton et al., 2005).

The purpose of the SPV is to achieve “bankruptcy remoteness” of the underlying assets, which is characteristic of structured finance. Under trust law, the underlying assets sold by the originator to the SPV are protected from creditors and do not count against the originator's bankruptcy property, a process known as a “true sale”. The “true sale” of "future claim" will often cause discussions in the theoretical and practical circles, because in the asset securitization of "future claim", the service provider is usually the originator himself, and the cash flow of the securitization are usually controlled by the originator and mixed by the enterprises’ cash flow.

The case of KaiDi Electric Power Co., Ltd. that occurred in 2018 proves the legal

[14] Off-balance sheet means the underlying assets can be "transferred" from the originator's balance sheet, therefor the originators’ risk of bankruptcy does not appear in ABS (Leland,2007).

practice of SPV’s “bankruptcy remoteness” in China. On August 6, 2018, 合肥 intermediate people's court made (2018) 皖 01 执异 No.43" Execution ruling". The court ruled to suspend the implementation of the electricity fee receivable and the subsidy of 30 million RMB of NanLing KaiDi Green Energy Development Co., Ltd. in State Grid AnHui Electric Power Co., Ltd. The judgment opinion of The Intermediate People's Court of Hefei Municipality, Anhui (HEFEI) on "cash flow ownership is not equal to the ownership of assets" supports the “bankruptcy remoteness” effect of SPV in law, and injects a shot of strength into China's asset securitization industry and financial market.

2.4 Credit Enhancement

Because SPV’s business activities are constrained and its ability to incur debt is limited, it faces the risk of a shortfall of cash below what it is obligated to pay investors. This chance is minimized via credit enhancement. The most important form of credit enhancement occurs via tranching of the risk of loss due to default of the underlying borrowers. Tranching takes the form of a capital structure for the SPV, with some senior rated tranches sold to investors in the capital markets (known as A and B notes), a junior security (known as C note) which is typically privately placed, and various forms of equity-like claims. Credit enhancement takes a variety of other forms as well, including over-collateralization, securities backed by a letter of credit, or a surety bond, or a tranche may be guaranteed by a monoline insurance company. There may also be internal reserve funds that build-up and diminish based on various criteria. (Gorton et al., 2005)

Excessive external credit will increase the financing cost of securitization. If the

external guarantor is the originator himself, the “Accounting Standards” may consider that the originator is in "control" of the underlying assets, thus the effect of off-balance sheet will be affected.

In the case of DaCheng Xi Yellow River Highway Bridge, the originator overestimated the cash flow (vehicle tolls) of the underlying assets, and did not attach sufficient credit enhancement measures, resulting in the breach of contract on the first payment.

2.5 Securitization in China’s Financial Reform

There is currently a great opportunity to develop China's asset securitization market. China is a country mainly engaged in indirect financing. On average, the balance of bank loans account for around 80% of the total amount of social financing[15], the scale of bond issuance accounts for about 10%, and the amount of stock issuance accounts for about 4%. As a supplement to traditional financing means, ABS account for a small proportion, representing only 2.75% of the total amount of social financing from 2014 to 2019, as shown in Figure 4.1.

In 2009, to cope with the global economic recession caused by the US subprime mortgage crisis, the Chinese government launched a "four trillion" RMB economic stimulus plan. The implementation of the plan led to overinvestment in China's economy, the accumulation of non-performing loans of commercial banks, and the rapid growth of shadow banks in the financial system. A large number of loans were added to the balance sheet of commercial banks, constituting a risk to these banks and the

[15] The total amount of social financing is the annual total amount of new financing of the financial industry to the real economy. It includes both the indirect financing of the banking system and the direct financing of bonds and stocks in the capital market.

broader financial system. Therefore, in 2016, the Chinese government put forward supply-side structural reform measures, namely "destocking, capacity reduction, deleveraging, cost reduction, and strengthening weak links". Asset securitization is one of the components of supply-side structural reform. For commercial banks, loan securitization can ease the dependence of loans on deposits and improve non-interest income (NIR) so as to realize the "asset light strategy" through off-balance sheet financing, thus transferring high-risk and low-income loans, and investing high-quality assets to enhance their profitability.

The development of the asset securitization market has important policy implications to China's "supply-side structural reform". The logical road map for China's financial reform is shown in Figure 1.4.

Regarding the changes that securitization has brought to China's financial market, Wang Fang (2020) concluded that loan securitization has indeed improved the credit-deposit relationship of banks but has not played a significant role in improving the income structure and reducing the risk of commercial banks. Under the background of supply-side structural reform, the correlation between ABS decision and the originators' financial characteristics is still very strong. The ownership of the enterprise does not affect its ABS decision. Medium and above credit rating firms tend to securitization.

In June 2020, NINE publicly offered REITs in China successfully IPO, raising 3.489 billion (RMB). The underlying asset of these REITs is ABS, and the industries involved are infrastructure and industrial parks. This move ushered in a new era. Its role is that ABS has realized the transformation from private equity to public offering, real estate has realized share-based transactions and market-based pricing, large state-owned

enterprises and local government platform companies can solve financing and deleveraging problems. Compared with ABS, REITs have stronger equity, which increases the proportion of direct financing and reduces the systemic financial risks in China's financial market.

China's financial reform is a huge, complex and far-reaching project, which requires the cooperation and efforts of the government and financial markets in an all-round way. The securitization market should be developed continuously and rapidly, which has great implications on China’s financial reform.

2.6 Chapter Summary

In short, securitization is a complex structured process involving transactions between participants with different motivations. Banks and non-financial corporations can securitize through a variety of activities to achieve roles in the flow of benefits provided. They can act as originators, service providers, credit enhancers in their own securitization structures. Banks and non-financial institutions may also participate in third-party securitization as trustees, providers of credit enhancement or liquidity support, issuing underwriters, or investors in ABS.

However, participation in securitization also exposes banks and non-financial institutions to risks, which, if not properly executed, may cause financial problems for banks or companies, which may lead to widespread problems in the financial system. The global financial crisis of 2008 evidence this situation. Therefore, it is essential to fully recognize and evaluate the risks inherent in the securitization process and manage them appropriately, while benefiting from the benefits that securitization brings.

3 LITERATURE REVIEW

There are three main strands of the literature on securitization that are relevant to our study. The first strand investigates the motive and economic effect for asset securitization. The second strand examines the selection of underlying assets. (This thesis focuses on the characteristics of two kinds of specific underlying assets, namely, the charging rights of infrastructures and intellectual property rights.) The third strand discusses the market environment of asset securitization and examines the policy effect of asset securitization under the background of China's financial reform.

3.1 The Motive and Economic Effect for Asset Securitization

The theoretical research on the motivation of asset securitization focuses on whether securitization can bring economic benefits to enterprises or not.

Asset securitization and friction costs

Minton et al. (1997) believes that enterprises choose asset securitization instead of issuing corporate bonds in order to avoid friction costs in issuing unsecured bonds. These friction costs come from the principal-agent and information asymmetry in financing contracts. This is embodied in the following aspects: insufficient investment, substitution of assets, expropriation of creditors and information asymmetry. Asset securitization can avoid "underinvestment", because restrictive contracts in securitization do not exist, so the management can actively carry out net present value (NPV) investment. (NPV is equal to the present value of the project's future cash flows minus the initial investment. Projects with a positive NPV are investable, and the higher the NPV, the better the project.) Securitization financing can avoid "asset substitution",

because the repayment of its debt comes from the assets specified in the issuance documents, rather than the uncertain assets under the issuer's overall credit. In unsecured bonds, creditors' interests may be forcibly taken over by shareholders or management, a phenomenon known as “creditor expropriation". On the contrary, the "creditor expropriation" of asset securitization deprives existing creditors or shareholders of their rights and interests to some extent. In this case, the company may securitize less risky assets and invest the cash generated in high-risk or even negative NPV projects. The company may also use the cash from the asset-backed securities (ABS) issue to pay shareholders or repay existing debts; information asymmetry will cause friction costs in the issuance process of corporate bonds, which is reflected in the fact that the management of unsecured bonds may utilize the exclusive ownership of corporate information to maximize the wealth of the shareholders. Potential investors, on the other hand, may underestimate the value of bonds for any reason under the information asymmetry. In the asset-backed securitization financing model, the Special Purpose Vehicle (SPV) issues bonds backed by pooled assets. The degree of information asymmetry of collateral value is far less than that of company value. As investors prefer bonds with collateral, companies facing severe information asymmetry are more likely to issue secured debt, such as securitization, for the cost of funding.

Asset securitization and financial distress

After analyzing the American ABS market, Minton et al. (1997), Yamazaki (2005) and Riachi et al. (2015) argue that companies in financial difficulties tend to favor asset securitization and give three reasons for doing so. First, the number of ABS companies with low credit ratings is growing. Among the ABS issuing enterprises, the proportion

of AAA enterprises dropped from 87.5% in 1985 to 42.6% in 2002. The number of companies rated below A rose from 0% in 1987 to 20.7% in 2002. Second, there are ways to hedge the SPV's credit risk. The emergence of a credit default swap facility allows ABS investors to hedge their ABS risk flexibly, thereby avoiding the impact of an originator's bankruptcy on the solvency of the SPV and alleviating investors' anxiety about buying ABS from the initiator in financial difficulties. Third, ABS diversifies the investor’s investment. Compared with mortgage loans, the risk of ABS revenue is limited to the underlying assets. The small face value of ABS can reduce the investment risk. The flexibility and liquidity of ABS make investors' investment portfolio more diversified. When every investment is less risky, investors may be willing to take more risk on some parts of their portfolios and less averseness to ABS from financially distressed companies.

Asset securitization and bankruptcy risk

Although there are many reasons for securitization, eliminating the "risk of insolvency" of investors is listed as one of the most prominent. A SPV that separates underlying assets from originators, is known as “true sale”. Whether these assets can be "transferred" from the originator's balance sheet (also known as off-balance sheet) or not, the risk of bankruptcy does not appear in ABS. "Bankruptcy remoteness" is the main feature of the SPV, which is used to avoid the losses of investors, caused by the bankruptcy of the originator. The use of SPVs reduces the number of bankrupt assets, thus reducing the cost of bankruptcy. Therefore, the off-balance sheet financing function of asset securitization is the most favorable for companies with high risks or facing huge bankruptcy costs (Leland, 2007).

Asset securitization and credit market segmentation

The decision to use asset securitization helps enterprises to enter the high-grade credit market. There are two main reasons that this is possible. First, the efficacy of "bankruptcy remoteness" makes investors willing to pay a premium. Gordon (2000) and DeMarzo (2005) point out that the SPV can make originators and the underlying asset achieve "bankruptcy remoteness". When investors know that their investment is isolated from the originator's potential bankruptcy risk, their bid for ABS will increase. As a result, a company that could not borrow at investment-grade rates was able to finance itself through securitization at that rate. Second, layered structures help senior investors obtain more investment opportunities. The cash flow layering technology of the SPV can improve the level of information disclosure of the underlying assets. With the help of senior securities, originators have access to the high-grade credit market and thus access to low-cost financing.

Asset securitization and accounting arbitrage

Dechow et al. (2009) and Lemmon et al. (2010) point out that many companies with high credit ratings choose to securitize their assets for accounting arbitrage purposes. Accounting standards on the sale of financial assets may encourage managers to actively choose the timing of securitization for the purpose of whitewashing accounting statements, such as improving the efficiency ratio, reducing the asset liability ratio, increasing the operating cash flow and earnings management. This is illustrated by the fact that more securitization transactions occur in the third month of each quarter and are concentrated in the last few days of the quarter. Therefore, accounting standards should consider from the perspective of better serving the users of

financial statements, and whether some asset securitization transactions should be treated as mortgage financing rather than “true sale” for accounting purposes, thereby to restrain the impulse of managers' statements whitewashing and earnings management. Feng et al. (2009) argues that there may be abuse of SPV under the information disclosure regulations, and the more SPV under supervision, the more likely its users are to pursue regulatory arbitrage. 朱荃等(2019) contends that asset securitization can reduce the leverage of enterprises, but it needs to meet two preconditions. One is to realize the “true sale” of assets in the accounting sense, the other is to use ABS revenue to repay any stock liabilities. 朱荃等’s study found that 60% of ABS issued in China between 2005 and 2017 failed to achieve “true sale” in the accounting sense, thus failing to achieve the expected goal of reducing corporate leverage.

Asset securitization and securities yield

Wu (2018) reviews rate of return on asset securitization by using the letter of guarantee as the research object. Wu’s review found that the yield of ABS tends to increase with the increase of cash flow risk probability. Excessive maturity of securities is often accompanied by high default risk, which leads to the decline of future cash flow and return of ABS. In addition, the return rate of ABS during an economic boom is higher than that in recession.

Securitization and income incentive distortion for originator

姜智强等(2012) translated the Bank for International Settlements Research Report--"Report on Asset Securitization Incentives" and on that basis points out that many studies believe that income generation is not the main motivation for originators to

participate in asset securitization, but on the other hand actually this is not the case. The income of the originator depends on the size and growth rate of the underlying assets, and has little to do with their credit status. The long-term performance of the underlying assets is not linked to the income of the originators, which leads to incentive distortion; the originators only focuses on asset size and short-term returns. As a result, more and more non-performing loans have begun to be securitized, and as the result the quality of underlying assets seriously declined.

In the empirical research of securitization, most scholars utilize commercial banks as the research sample and focus on the European and American financial markets. Few of studies focus on non-financial enterprises and the implications to China's financial reform.

3.1.1 The Motivation of Bank's Loan Securitization

Greenbaum and Thakor (1987) write that loan securitization is an alternative to bank debt financing and establishes a model of determinants of loan securitization. DeMarzo (2005) argues that packaging loans into pools and subsequently selling them in layers could increase the value of loans, emphasizing the benefits of loan securitization to banks. Guo and Wu (2014) establish a risk-based asset selection model and believe that risk management is the main driver behind loan securitization of commercial banks. Minton et al. (2004) argues that the determinants of loan securitization are regulatory arbitrage and profitability promotion. Martin-Oliver and Saurina (2007) contends that the reasons for loan securitization are liquidity demand, risk transfer and profitability promotion demand. Bensalah and Fedhila (2016) find that among all literature on loan securitization, liquidity demand, risk transfer, regulatory

arbitrage and profitability promotion are cited the most frequently.

Casu et al. (2013) estimate the impact of securitization on some bank performance indicators, including financing cost, credit risk, profitability, interest income and expense structure, liquidity, loan portfolio, capital and growth, using the data of American commercial banks from 2001 to 2008. That study found that there is no evidence that securitization has a significant impact on the performance indicators considered. In other words, the performance of securitized banks does not seem to be significantly better than that of non-securitized banks. The possible explanation to this finding is that the potential securitization gains of banks may be offset by the implicit or explicit costs of constructing transactions. Therefore, it is necessary to improve the supervision of securitization and bring more standardization and transparency to the market, so as to ensure that the potential risks do not exceed the potential benefits of the banks' participation in securitization. Chen et al. (2008) point out that the purpose of bank loan securitization is to benefit from the “true sale” of loans. Although some banks may provide implicit guarantee for their loan securitization products, these are not strictly the case of an off-balance sheet.

Rösch et al. (2012) find that the credit rating of securitization will stimulate the regulatory arbitrage motivation of financial institutions, in order to reduce the regulatory capital demand. Zhang et al. (2019) propose a cost-benefit analysis framework based on bank incentives, and empirically examine five determinants of Chinese commercial banks’ loan securitizations, such as liquidity demand, regulatory arbitrage, performance improvement, risk transfer and cost advantage exploitation. These researchers conclude that large commercial banks in China during the loan review period carryout specific

regulatory determines with the result that small- and medium-scale banks with poor asset quality do not qualify.

Wang Fang (2021) uses the Logit and Tobit model to conduct empirical research on 35 listed banks in China from 2012 to 2019, and find that the main motivations for loan securitization include "cost advantage exploitation" and "profitability promotion". Those commercial banks with large assets and low default risk tend to securitize their loans. With the maturity of the ABS market, the motivation of “regulatory arbitrage” has been gradually replaced by the motivation of “profitability promotion”. Default risks of listed banks themselves rather than that of loan customers affect bank’s loan securitization decision more. The fourth chapter of this thesis is a more detailed discussion on the motivations for loan securitization of listed banks in China.

3.1.2 The Motivation of Non-financial Enterprise’s Securitization

Minton et al. (1997) is an earlier literature on the motivation of asset securitization of non-financial enterprises. The study takes 41 non-financial listed companies in the United States as samples for empirical research from 1987 to 1994. (Although the data sample is from 1987 to 1994, the nature of financial instruments remains the same today.) The study found that these companies have some common financial characteristics during the period of asset securitization, such as large-scale assets, concentration of accounts receivable, and most of them are in financial difficulties and as a condition of securitization history, are valid today. However, Minton et al. (1997) selected a fewer samples and variables, so the conclusion is relatively simple. Lemmon et al. (2014) improved upon the research of Minton et al. (1997). After analyzing 434 non-financial listed companies that issued ABS in the United States from 1996 to 2009,

the study find that the asset securitization market welcomes those enterprises with a high asset liability ratio and medium overall credit rating. Also, there is a concave relationship between asset liability ratio and ABS issuance intention. Rosegg (2016) extends the research period of Lemmon et al. (2014) and selected 160 listed companies that issued ABS in the United States from 2012 to 2014 as samples. The results of this study are basically consistent with Minton et al. (1997) and Lemmon et al. (2014).

There are few empirical studies on asset securitization in China. The main reason is that the time when asset securitization business first appears to the present is rather too short and the available data is yet insufficient, too. To present, there are mainly two research methods to study the motivation of non-financial enterprise's securitization. One is to review asset securitization as an independent variable, to study the impact of asset securitization on financial performance and stock return, the other is to review asset securitization as a dependent variable, to study the determinants of asset securitization. 杨波等(2018) uses the event study method and the Fama–French three-factor model to study the short-term wealth effect of asset securitization, taking 26 ABS products issued by 19 listed companies in China from 2014 to 2016 as samples. 杨波等 study found that asset securitization has a positive short-term wealth effect. The smaller the market values of the originator, the more obvious the wealth effect of asset securitization. Then we have 李丹等(2019) who used the factor analysis method to analyze the financial performance of asset securitization in 55 central state-owned enterprises. That study concluded that asset securitization improves the profitability and liquidity of enterprises, but has no significant impact on solvency and operating capacity. 肖东生等 (2016) studied the relationship between the decision of asset securitization

and the company's financial characteristics, reviewing 33 listed companies in China from 2007 to 2014 as samples and using the Probit regression model. The conclusion of that study is that the smaller the scale, the greater the liquid liabilities, decision makers are more inclined to carry out asset securitization. 张胜松等 (2018) studied the motivation of asset securitization, based on the logistic model and taking 120 enterprises from 2004 to 2017 as samples. The empirical results show that the motivations of asset securitization are not to reduce the financing cost, but expand the financing scale, supplement liquidity and improve debt paying ability. In the research of 杨波等 (2018) and 李丹等 (2019), asset securitization is regarded as an independent variable; thus their research methods are added here solely for model design purposes. There are three problems in the research of 肖东生等 (2016) and 张胜松等(2018). First, the sample data is small, so the reliability of the research conclusion is weak; Second, the research conclusion of "small-scale enterprises tend to asset securitization" of 肖东生等 (2016) is contrary to the mainstream foreign literature (Lemmon et al., 2014) (only large firms tend to asset securitization because of the high cost of the securities and small firm with few underlying assets can’t reach scale economy), and it is questionable. Third, these documents do not mix well with the background of China's financial reform, and their conclusions are not of a strong policy significance. More on how this thesis brings more compelling data to the argument is discussed in Chapter 3.3 and 4.1.

Wang Fang (2020⑴) uses the Probit regression model to conduct an empirical study on 3444 non-financial companies in China's Shanghai and Shenzhen A shares from 2012 to 2017. It is concluded that there are thresholds and scale effects in the asset

securitization business, and the securitization market does not welcome small companies with credit ratings below AA+. Securitization companies usually have fewer investment opportunities and a shortage of cash flow, so they may face financial difficulties. The motivation for securitization of AAA companies is to reduce leverage, and for the securitization of AA+ companies is financing. Unsecured creditors have restrictions on the issuance of securitization, but the strength is relatively weak. The motivation for ABS of Chinese non-financial companies is discussed in Chapter 5 of this thesis.

3.1.3 The Economic Effect of Asset Securitization

Kiff et al.（2014）argues that securitization is a process which allows for a re-distribution of risk to those who are willing to bear the challenge. Financial institutions should thus be able to reduce concentrated risks in their portfolios by transferring all (or part of it) to capital markets. As such, this activity should increase lending activity, foster financial stability and decrease the overall cost of capital. Bertay et al. (2017) analyzes the relationship between securitization and economic activities at the national level. Securitization is negatively correlated with various indicators of economic activity - even before the 2007-2009 crises. The explanation to this is that securitization can stimulate consumption, but at the expense of investment and capital formation. There is a negative correlation between household loan securitization and economic activity, while there is a weak positive correlation between commercial loan securitization and economic activity. Only securitization of household loans has increased the consumption investment ratio of the economy.

Wang Fang (2021) finds that China's asset securitization has not improved the

investment efficiency of China's financial market. The possible reason is that the current stage of China's asset securitization market is small, which is not enough to have an impact on the market and economy.

3.2 The Choice of Underlying Assets in Asset Securitization

Gordon (2000) points out that asset securitization has become a popular financing method. Companies will be able to securitize everything from ordinary receivables, credit card receivables, loan receivables to more exotic music royalties, taxi licenses and unpaid real estate taxes. By the end of June 2020, the types of underlying assets in China's asset securitization market are: personal housing mortgage loans, automobile loans, corporate loans, consumer loans, non-performing loans, credit card loans; accounts receivables, lease rents, trust income rights, enterprise creditor's rights, commercial housing mortgage loans, petty loans, factoring financing creditor's rights, infrastructure charging rights, REITs, et al. (李波等 2020). The lists continues to grow because of the listing of the first batch of public infrastructure REITs funds.

3.2.1 Securitization of Infrastructure Charging Right

Infrastructure charging right is a kind of future claim. It is necessary to focus on two points, launching securitization with future claims as underlying assets.

The first point is the right basis of assets. 朱晓喆 (2019) believes that those claims that do not exist in reality and what are expected to be obtained are future claims. When the future claim is transferred, if the starting date and stop conditions of the right are clearly defined, and the relationship between the creditor's right and the debt is continuous, it is called "Future claims with right basis". In the future assignment of

claims, when the claims occur, the assignee can obtain the claims directly, and the underlying assets can realize risk remoteness, and its legal effect can be traced back to the time when the assignment of claims is consensual. Such claims include various charging rights for Water, Electricity, Heat and Gas supply; if there is no right basis at the time of the transfer of the underlying assets, and the rights are generated by signing a contract only when subsequent events occur, this is called "Future claims without right basis" or "pure future claims". For the transfer of pure future claims, the assignee must obtain it through the assignor, so the underlying assets cannot be separated from the assignor and thus has no retroactive effect. This kind of future claims includes road and bridge charges, public utility fees and other licensing or franchise rights.

The second point is the "bankruptcy remoteness" of the underlying assets. Lemmon et al. (2010) argues that securitization can be thought of as an extreme form of secured borrowing, as creditors' claims on the SPV are backed exclusively by the assets of the SPV and unrelated to the originating firm. Ayotte et al. (2011) asserts that ABS is designed to achieve "bankruptcy remoteness" of the securitized assets from the borrowing firm. This provides lenders with maximal protection from dilution in bankruptcy that is not available with other contracts, such as a secured debt contract. Using a difference-in-differences approach, the researchers obtained the results that demonstrate that the creditor protection provided by "bankruptcy remoteness" is indeed valuable and is priced in by the financial markets.

There are two typical cases of "bankruptcy remoteness" in the industry. The different judgments made by Chinese and American courts represent different understanding of the effectiveness of SPV in the legal field, which has an important

impact on the ABS market. Ayotte et al. (2011) studied the bankruptcy case of the American LTV steel company in 2000, and pointed out that the provisional order issued by the bankruptcy judge on allowing LTV steel company to use securitized assets as cash collateral to support its restructuring actually regards securitization transaction as secured loan. The result of this judgment brings great uncertainty to the ABS market, which makes investors doubt the “true sale” status of securitization assets, and questions the “bankruptcy remoteness” effect in ABS trading.

However, the ABS “bankruptcy remoteness” case of KaiDi Electric Power Co., Ltd. that occurred in 2018 resulted in a completely different judgment. On August 6, 2018, 合肥 intermediate people's court made (2018) 皖 01 执异 No.43" Execution ruling". The court ruled to suspend the implementation of the electricity fee receivable and the subsidy of 30 million RMB of NanLing KaiDi Green Energy Development Co., Ltd. in State Grid AnHui Electric Power Co., Ltd. The court held that the subsidy of 30 million RMB was owned by the SPV Manager (ShenZhen DaHua asset management company) of "KaiDi Electric Power Charging right of the ABS", and did not support the defense of DaXing Branch of HeFei Agricultural Bank of Science and Technology, which is the creditor of NanLing KaiDi. The judgment opinion of The Intermediate People's Court of Hefei Municipality, Anhui (HEFEI) on "cash flow ownership is not equal to the ownership of assets" supports the “bankruptcy remoteness” effect of SPV in law, and injects a shot of strength into China's asset securitization industry and financial market.

The characteristic practice of China's infrastructure charging rights ABS in terms of “true sale” and “bankruptcy remoteness” features are discussed in detail in Chapter

6 of this thesis and Wang Fang (2019).

3.2.2 Intellectual Property Asset-backed Securitization (IPABS)

What are the advantages of IPABS?

袁晓东 (2010) explains that patent asset securitization is not only an extension of traditional accounts receivable securitization in the patent field, but also a kind of institutional innovation. This view derives from the government's understanding of the patent value and further likely demands for financing. Under the circumstances patent licensing and pledge financing systems have been established in many countries around the world. Patent asset securitization is still necessary because of the following advantages: it can obtain a larger proportion of financing than the pledge loan, discount the future cash flow of patent license fees and obtain cash in advance at one time. The securitization of fixed interest bonds can not only guarantee the return of investors, but also reduces the risk of the issuer. Under the risk remoteness mechanism, investors are not in the position of unlimited recourse, which makes the financing safer, and the patentee does not lose the ownership and control of the patent. 徐士敏 (2019) summarizes the advantages of IPABS. First, the patent makes an intangible asset, tangible. Once the intellectual property is securitized, the intellectual property originally included in intangible assets can be converted into cash by issuing ABS and then reinvested into any other tangible assets. Second, it internalizes off-balance sheet assets. Due to various reasons, some intellectual property rights have not been included in the enterprise balance sheet because of the no right application. After securitization, intellectual property can become cash, bonds, foreign equity investment and other line items on balance sheet as assets through operation. Third, the patent can transform the

long-term fixed stock assets into a liquid incremental asset. As an intangible asset, intellectual property has a certain value or potential value, but its liquidity is usually poor. If it can be converted into negotiable securities in the market, the liquidity of intellectual property is greatly increased.

What are the disadvantages of IPABS?

洪艳蓉 (2013) points out that a patent right itself is not suitable for securitization. This is because of the uncertainty of value, the specificity of assets, the unique risk and the difficulty of handling. From the overseas practice, the underlying asset of patent securitization is usually the patent derived by financial claims - the right to charge license fees. Under the licensing condition, the patent shows the advanced technology and economic value through market inspection, and the permitted transaction specifies the market price of the patent, and it can take the expected cash flow as the credit basis for financing. At the same time, the securitization based on a license fee does not change the ownership of patent right, which is conducive to the subsequent development and continuous benefit of patentees, and can avoid financing failure caused by different opinions of co-owners in dealing with patents. 周丹妮等 (2020) believes that the following deficiencies exist in the securitization of intellectual property rights. Firstly, it depends on external means of credit enhancement. Therefore, the issuance of securitization products usually needs external credit enhancement measures such as guarantee or a difference making up. Dependence on an external guarantee will increase the issuance cost of IPABS and limit the development space of IPABS market. Secondly, it likely cannot meet the scale requirements of the underlying asset. Intellectual property has the characteristics of fragmentation, high heterogeneity and

low degree of standardization, so it is not suitable to be the underlying asset of large-scale securitization.

What is the logic and path of intellectual property and its securitization?

袁晓东 (2010) believes that in the case of high transaction costs of intellectual property marketization, patentees usually choose to transform patents voluntarily, that is, from R&D to patent application, patent protection and patent application, all of which are completed by the patentee independently, which is called "integration of patent". Only when patent can produce goods or provide services together with other complementary assets can it generate meaningful revenue. In the absence of complementary assets, often patentees will give up "patent integration" and choose the "patent licensing" strategy. 陶红武 (2011) believes that some intellectual property rights have property rights and personal rights. In this case, property right refers to the right to obtain material interests by using intellectual property rights, such as: reproduction, distribution, exhibition, broadcasting, etc.; the personal right refers to the personal rights enjoyed by the obligee based on the product creation. Taking copyright as an example, copywrites generally include the right of publication, authorship and protection the integrity of works. Personal rights cannot be transferred, so only property rights can be securitized. 梁艳 (2019) believes that the premise of direct securitization of intellectual property rights is to have a "source of repayment", and a developed intellectual property licensing market can provide enough licensed claims to act as the "repayment source". At present, in China, under the condition that the intellectual property licensing market is not developed, intellectual property can create repayment sources through a “trust” operation.

What is the choice of underlying assets of IPABS?

邹晓芃等 (2009) analyzes the typical cases of patent securitization in the United States and Japan, and points out that the selection of underlying assets is the most important link in patent securitization. The specific measures include: 1. make a prudent selection of underlying assets. First, we should choose those industries with high barriers to entry and can guarantee certain monopoly profits, such as biopharmaceuticals. Second, we should choose those companies with a higher-than-average credit rating, strong strength and weak correlation. This can effectively spread the various risks from the Licensee. Finally, we should choose the patent products with the top market share and good market prospects. It is better to choose patent products that have been sold in the market for several years and have good sales revenue performance; 2. pay due attention to the substantive investigation of patent rights. Through the substantive investigation of patent rights, those patents that may face infringement, litigation or may be declared invalid are excluded; 3. establish a diversified, underlying asset pool. Single underlying assets make the risk of securitization transaction too concentrated. Diversified assets can disperse and reduce the risk of poor performance of individual assets.

What are the types of originators of IPABS

Sichelman et al. (2010) points out that small start-ups largely rely on patent applications to raise funds, seek investment opportunities, and improve the image of the company and their products, while in large enterprises, financing through patents is much less. 解静 (2017) believes that pharmaceutical companies, scientific research institutions and high-tech enterprises are most suitable for securitization in the patent field; in the field

of trademarks, the mainstream entertainment industry, clothing industry and consumer goods production enterprises are the most suitable for securitization. Compared with copyright securitization, patent and trademark securitization is less developed. The reason for this condition is that the process of forming cash flow of patents and trademarks is complex (need to be converted into related products), and it is difficult to analyze quantitatively.

What is the “bankruptcy remoteness” of IPABS

黄光辉（2009）believes that it is very difficult for the underlying assets in IPABS to realize “bankruptcy remoteness” from SPV. The reason is that intellectual property assets need to cooperate with other resources in order to play an effective role, or their value is closely related to the operation of specific institutions. While transferring them to SPVs to achieve risk remoteness, it may also isolate the connection between intellectual property assets and other complementary resources, resulting in their failure to maximize their value.

What is the risks of IPABS?

洪艳蓉 (2013) summarizes the main risks of IPABS by taking the patent license charging right as an example. Here let us review the four main conditions, namely: 1) whether the asset credit matches the risk or not. As the credit basis of financing, the future cash flow after deducting the cost can fully repay the investment rights and interests; 2.whether the term matches the risk or not. The licensing period of the securities should be paid to the investors in accordance with the royalty arrangement. The right to charge for patent license must generate enough cash flow before the agreed

time limit for repayment of principal and interest, otherwise it will easily lead to breach of contract and cause panic by investors; 3. whether the liquidity matches the risk or not. The amount of cash flow generated within a certain period of time of the patent licensing fee right, should meet the requirement of paying securities rights and interests within the corresponding period. In addition to the term, any mismatch will cause liquidity problems in the asset pool, the payment method of patent royalty is also a major factor. In practice, "royalty payment" or "entry fee + royalty fee" is often used. Royalty basis includes the output, sales volume, sales volume or profit of the patent products. But these are easily affected by many factors such as market conditions, competitive patents, operating ability of the licensee and so on. Only by actual implementation can we accurately calculate and finally determine the amount of payment; 4. moral hazard. This refers to the behavior that the patentee or the intermediary institution is engaged in damaging the rights and interests of investors. For example, fictitious patent license fee income, or concealing the value impairment of the patent license fee right, or failing to fulfill the obligation of maintaining the patent and the patent license validity during the existence of securitization.

Wang Fang (2020⑹) conducts a multi-case analysis of 4 intellectual property securitization products issued in China in 2019. Believes that the advantage of IPABS in China lies in realizing the liquidity of intangible assets and helping small and medium high-tech companies solve financing difficulties in order to meet the country’s strategy of making the country strong in science and technology; and the disadvantage of IPABS lies in its cash flow "compliance" dilemma. Wang Fang (2020⑹) proposes a solution to construct a dual SPV transaction structure with current Chinese characteristics, and

discusses the possible risks of the SPV transaction structure. A more detailed discussion of China's IPABS is in Chapter 7 of this thesis.

3.3 Financial Market Environment of Asset Securitization

Since the “11th five-year” China plan[16], China has begun to reform its financial system. The specific steps taken includes: (1) reform of the state-owned banks' shareholding system; (2)rationalize market positioning of policy banks; (3) innovation of the bond market products; (4) reform of the financial industry; (5) coordination of stability and development; and (6) fully opening the financial market in the post WTO transitional period. In the 30 years before the reform and opening up, China's financial system played a positive role in supporting economic growth and maintaining financial stability. (黄益平等, 2019).

Nowadays, the system is facing many challenges that are difficult to manage, which are embodied in three aspects. First, the finance cannot meet the needs of the real economy. Second, the boundary between the government and the market is not clear. Third, the financial supervision cannot control possible financial risks (琳达.岳, 2015; 黄益平等, 2019). In May 2018, nine ministries and commissions, including the People's Bank of China, issued the “13th five-year” plan[17] for the modern financial system, proposing that the fundamental goal of China's financial system modernization is to realize the return of functions. That is, from the actual needs of China's economic and social development, give play to the basic functions of financial allocation time value, financing funds and risk management.

[16] China's 11th Five-Year Plan for National Economic and Social Development (2006-2010)
[17] China's 13th Five-Year Plan for National Economic and Social Development (2016-2020)

At the end of 2008, the Chinese government launched the "four trillion" RMB economic stimulus plan, to cope with the global economic recession caused by the US subprime mortgage crisis. The implementation of the plan has led to overinvestment in China's economy, the accumulation of non-performing loans as well as the rapid growth of shadow banking in the financial system. At the end of 2016, the Chinese government put forward supply-side structural reform measures, namely "destocking, capacity reduction, deleveraging, cost reduction, and strengthening weak links".

Asset securitization is one of the components of supply-side structural reform. By the off-balance sheet, originators can realize the ABS proceeds and the “true sale” of old assets. As the use of ABS proceeds are not supervised by investors, enterprises can optimize the asset structure, such as debt repayment or high-income investment, which is called "*TENG LONG HUAN NIAO*".

For commercial banks, loan securitization can ease the dependence of loans on deposits and improve non-interest income (NIR) so as to realize the "asset light strategy" through off-balance sheet financing, thus transferring high-risk and low-income loans, and investing high-quality assets to enhance their profitability.

For non-financial companies, off-balance sheet financing of asset securitization does not increase the liabilities, and can help "deleveraging" with the use of asset securitization, enterprises securitize undesirable assets to realize their future cash flow in advance, so as to realize the supply-side structural reform of "*TENG LONG HUAN NIAO*" with new investment projects. The financial market environment and the background of China's asset securitization is visualized in Figure 1.4 (Chapter 1) of this thesis (Figure 1.4 The Logical Road Map for China's Financial Reform) and Wang

Fang (2021).

3.3.1 Asset Securitization and Monetary Policy Implementation

One of the main problems facing China's financial system is the unsound transmission mechanism of the monetary policy. When the financing structure of the financial market is unreasonable and the proportion of indirect financing is too large, the transmission of monetary policy can only be realized by administrative means such as credit scale (沈炳熙, 2006). International experience shows that there is a positive correlation between the ratio of bank assets to financial assets and financial repression. The higher the proportion of bank's assets in the financial system, the higher the degree of government intervention in the financial system. In countries and regions with data, China's financial system has the characteristics of a high proportion of bank assets and serious financial repression (黄益平等, 2019). Asset securitization can transform indirect financing into direct financing by issuing securities, which is conducive to improving the transmission mechanism of monetary policy. If the range of investors is large enough, the impetus for direct financing may be stronger.

The excessive proportion of indirect financing in China is an important reason for the poor transmission mechanism of monetary policy and high systemic financial risks. The purpose of the government's launch of ABS is to adjust the financing structure of China's financial market and convert indirect financing into direct financing. Wang Fang (2021) conducted a discussion on the financing structure of China's financial market. This paper made intuitive statistics in Figure 4.1 in Chapter 4.

3.3.2 Asset Securitization and Commercial Bank Operation

The traditional business of commercial banks is mainly interest income, while the income of intermediary business is relatively small. Through asset securitization, commercial banks convert illiquid loans into cash and then invest in other non-credit financial assets. Asset securitization helps commercial banks reduce the proportion of credit assets, which causes commercial banks to not only use credit instruments, but also rely on intermediate business operations, such as participating in the bond market (government bonds, corporate bonds, ABS, etc.) (吴青, 1999; 沈炳熙, 2006). Asset securitization can also change the dependence of commercial banks on deposits and realize credit expansion. Excessive dependence on deposit financing will make part of the credit demand unsatisfied, thus reducing economic efficiency. As a new source of capital for commercial banks, securitization can relax the relationship between deposits and credit growth (Almazan et al., 2015).

Wang Fang(2021) finds that loan securitization has indeed improved the credit-deposit relationship of banks but has not played a significant role in improving the income structure and reducing the risk of commercial banks. The spread business of indirect financing is still the most profitable and the safest investment choice in China's financial market. The analysis of this part is in Chapter 4 of this thesis.

3.3.3 Asset Securitization and Financial Market Efficiency

In China's recent 40 years of reform and development, fixed assets investment has been the main driving force of economic growth. In the past, China's economic growth was mainly driven by production factors, but now it needs to be driven by innovation.

The financial system that has successfully supported factor driven growth in the past is now in urgent need of transformation. In recent years, the investment efficiency indicator ICOR (incremental capital output ratio) has increased significantly (from 3.5% in 1985 to 15% in 2017), indicating that China's capital or financial efficiency is declining. The result of the decline of financial efficiency is the increase of financial risk. In the past, China was the only emerging market economy without a major financial crisis. Now, preventing systemic financial risks has become one of the three major reform goals of the government (黄益平等, 2019). Securitization helps to reduce the systemic financial risk of the banking system by converting long-term infrastructure loans into more effective financial assets.

Wang Fang (2021) establishes a sensitivity analysis to test the relationship between ICOR and ABS tendency. The study finds that the role of China's loan securitization in financial reform is very limited. A potential reason for this limitation is that the amount of loan securitization of commercial banks is not large enough and has little influence on the financial market (in 2018, the proportion of loan securitization issuance scale as a proportion of total bank assets has only reached 0.45%). This thesis analyzes this content in Chapter 4.

3.3.4 China's Financial Reform and State-owned Enterprises

Huang et al. (2017) study Hayek's “The Use of Knowledge in Society” points out that when a society experiences rapid changes, the final decision should be left to those who are familiar with the specific situation, and need some form of decentralization. But when the central government decides to control the commanding heights, Hayek's conjecture loses most of its explanatory power. Barry (2019) remarks that one of the

challenges facing China's financial reform and opening up is the debt problem of enterprises. China's sector debt accounts for more than 250% of GDP, second only to Japan, France and the UK, about 60% is corporate debt. In response to the global financial crisis in 2008, China relaxed its loan quota. Most of the new corporate debt is concentrated in the steel, aluminum, energy, transportation and real estate industries. 张杰 (2015, 2018) notices that there are multiple mismatch effects in China's financial system at the current stage. The specific performance is as follows; 1) loan maturity mismatch. The risk conservative banking and financial institutions, which mainly focus on short-term loans, are difficult to match the transformation and upgrading of the real economy sector dominated by manufacturing industry and the long-term financing demand contained in the independent innovation capability system; 2) loan risk mismatch. Banking institutions rely on their own monopoly position to maximize their commercial interests, leading to the majority of private enterprises and small- and medium-scale enterprises that find it difficult to obtain funds from banks due to the lack of absolute security collateral; and 3) loan supply and demand mismatch. The internal operation logic followed by Chinese banking institutions inevitably leads to the priority of banking institutions to provide funds to these sectors. i) State owned enterprises, especially large-scale central enterprises, which occupy the key links of the national economy, ii) large-scale enterprises in a mature and stable period, iii) real estate enterprises that can pay high loan interest rates, iv) investment and financing platform companies with local government as implicit guarantee, and v) the government as an investment and financing platform for company projects[18], for investors and ultimate solvers. "铁,公,机"

[18] Refers to railway, highway and airport construction projects.

Wang Fang (2020(1)) studies the asset securitization decisions of listed companies in China's non-financial companies and found that since most of the AAA companies that choose securitization are state-owned enterprises, the motivation for securitization is not financing (there are no financing difficulties in these companies) but to reduce the asset-liability ratio to meet regulatory requirements. The impact of asset securitization on China's financial reform and state-owned enterprises is studied in Chapter 4 and Chapter 5 of this thesis. The conclusion is that the effect of asset securitization is not significant at present (the possible reason is that the market size is too small).

3.4 Summary of the Literature and Motivations for the Research

To sum up, previous studies provide evidence that securitization can increase economic benefits for enterprises. Specifically, through securitization, banks can diversify their investment portfolio, focus on business activities with comparative advantages, raise funds, reduce financing costs, better manage credit risk and improve performance. However, there is also evidence that in practice, securitization may have adverse effects on bank performance through many indirect channels, including: (1) Securitization may be driven by regulatory capital arbitrage and earnings management; (2) A large number of credit enhancement may lead to the originator's high financing cost and the deterioration of the credit quality of the underlying assets; (3) The influence of borrowing behavior after securitization is uncertain in the following aspects, such as the dependence of bank deposits and loans, the composition of bank operating income, and the impact of commercial banks on the credit quality of the underlying assets risk status, and the efficiency of social capital investment. Therefore, previous studies have shown that the net impact of securitization on commercial banks, the financial system

and non-financial enterprises may be ambiguous.

4 LOAN SECURITIZATION WITHIN CHINA'S FINANCIAL REFORM

4.1 Introduction

In 2014, the China Banking Regulatory Commission (CBRC) launched the filing system (Filing System), and the issuance speed of loan securitization was greatly accelerated. In 2014, the annual growth rate of ABS issuance in the inter-bank market reached 1,018.88%. However, the growth rate began to decline after 2014, evidenced by lower growth rates in 2015 (43.85%) and 2016 (-3.64%)[19](Table 4.1).

Table 4.1 The Issuance of Inter-bank Asset Securitization from 2005 to 2019

Year	Issue Amount (¥100 million)	Annual Growth rate of the Issuance (%)	Issue Numbers
2005	71.94	-	2
2006	142.55	98.15	5
2007	264.20	85.34	8
2008	413.26	56.42	15
2009	170.68	-58.70	13
2010	47.31	-72.28	10
2011	24.41	-48.40	4
2012	201.77	7.27	8
2013	252.02	24.91	13
2014	2,819.80	1,018.88	66
2015	4,056.33	43.85	106
2016	3,908.53	-3.64	108
2017	5,972.29	52.80	133
2018	9,323.35	56.11	156
2019	9,433.36	1.18	180

Source: CNABS

What is the decisive factor for the development of China's loan securitization market? Is it driven by policies or the demand of banks themselves? As an important financial tool for supply-side structural reform, has China's asset securitization played a

[19] Although the growth rate of issuance slows down, the total amount of issuance continues to increase.

role in improving the income structure of banks and the efficiency of the financial market? These are all good solid questions. The following paragraphs attempt to address these important questions.

4.2 Background of Loan Securitization of Commercial Banks in China

From a capital cost perspective, when the comprehensive financing cost of bonds and stocks are high, commercial banks will choose loan securitization. Table 4.2 is a simplified commercial bank balance sheet. Issuing bonds reflects the securitization of "liabilities", which increases the leverage of commercial banks, and the use of funds is limited by creditors. Issuing stock is the securitization of "owner's equity". Based on the current situation of China's stock market, the waiting period for stock financing is long, the comprehensive capital cost is high, and new shares will dilute the control of major shareholders of the company. Issuing asset-backed securities (ABS) is the securitization of "assets" on the left side of the bank’s balance sheet. The use of ABS proceeds is not limited by investors, nor will it increase the bank's asset liability ratio, and the comprehensive capital cost is low.

From the perspective of profitability, shadow banks in China's financial system have developed rapidly in recent years. The high yields of online P2P financial products have had a significant impact on the interest margin profit model of banks. Commercial banks have had to look for new profit growth opportunities through financial innovation. Asset securitization represents one of these opportunities, allowing banks to sell low-profit loans and invest in high-profit projects, thus improving business performance.

Table 4.2 Commercial Bank's Securitization

Assets	Liabilities	Owner's equity
Loan	Deposit	Capital
↓	↓	↓
Loan-backed security	Bond	Stock

From the perspective of regulatory arbitrage, when commercial banks need to whitewash their balance sheets to meet regulatory requirements, they will choose loan securitization. At present, the main regulatory indicators of China's commercial banks include the capital adequacy ratio (CAR) (core CAR is greater than or equal to 8%), liquidity ratio (greater than or equal to 100%), loan deposit ratio (less than or equal to 75%) etc.[20]. When commercial banks fail to meet these regulatory indicators, they are punished by regulators, and the stability of banks will be questioned by the financial market. Loan securitization of commercial banks convert loans on the balance sheet into cash, reducing the loan balance required to meet the loan deposit ratio whilst supplementing capital to improve CAR. Furthermore, loan securitization allows commercial banks to increase their current assets, ensuring that the liquidity ratio is in line with regulatory requirements.

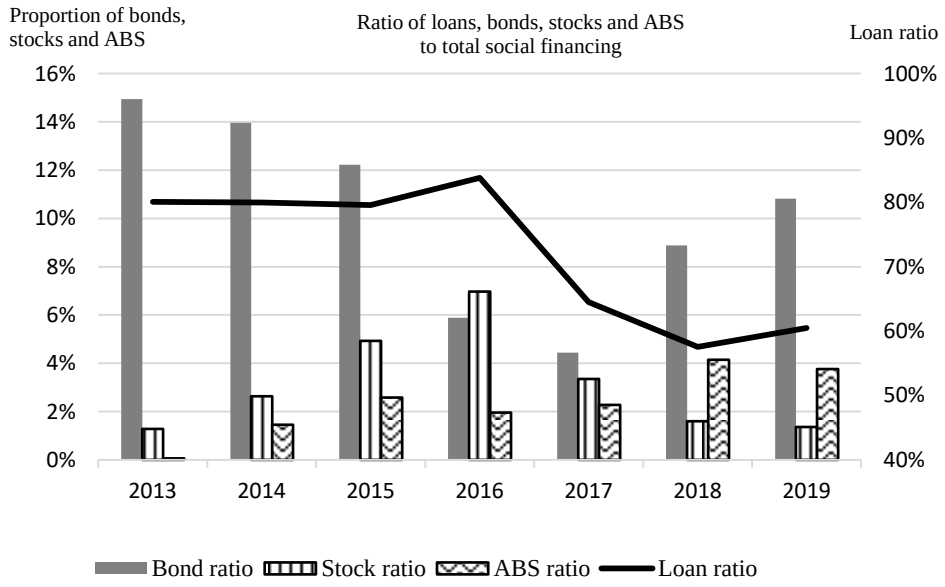
There is currently a great opportunity to develop China's asset securitization market. China is a country mainly engaged in indirect financing. On average, the balance of bank loans account for around 80% of the total amount of social financing[21], the scale of bond issuance accounts for about 10%, and the amount of stock issuance

[20] *Source*: CBIRC website.

[21] The total amount of social financing is the annual total amount of new financing of the financial industry to the real economy. It includes both the indirect financing of the banking system and the direct financing of bonds and stocks in the capital market.

accounts for about 4%. As a supplement to traditional financing means, ABS account for a small proportion, representing only 2.75% of the total amount of social financing from 2014 to 2019, as shown in Figure 4.1.

Figure 4.1 Proportion of Loans, Bonds, Stocks and ABS in Total Social Financing in China's Financial Market



Source: WIND

In 2009, to cope with the global economic recession caused by the US subprime mortgage crisis, the Chinese government launched a "four trillion" RMB economic stimulus plan. The implementation of the plan led to overinvestment in China's economy, the accumulation of non-performing loans of commercial banks, and the rapid growth of shadow banks in the financial system. A large number of loans were added to the balance sheet of commercial banks, constituting a risk to these banks and the broader financial system. Therefore, in 2016, the Chinese government put forward supply-side structural reform measures, namely "destocking, capacity reduction,

deleveraging, cost reduction, and strengthening weak links". Asset securitization is one of the components of supply-side structural reform. For commercial banks, loan securitization can ease the dependence of loans on deposits and improve non-interest income (NIR) so as to realize the "asset light strategy" through off-balance sheet financing, thus transferring high-risk and low-income loans, and investing high-quality assets to enhance their profitability.

4.3 Literature review and hypotheses

4.3.1 Literature review

⑴ The motivation of bank's loan securitization

Greenbaum and Thakor (1987) point out that loan securitization is an alternative to bank debt financing. DeMarzo (2005) believes that packaging loans into pools and subsequently selling them in layers could increase the value of loans. Guo and Wu (2014) find evidence that risk management of selling loans is the main driver behind loan securitization. Many studies conclude that the determinants of loan securitization are regulatory arbitrage, liquidity demand, risk transfer, profitability promotion demand and cost advantage exploitation (Minton et al., 2004; Martin-Oliver and Saurina, 2007; Bensalah and Fedhila, 2016; Zhang et al., 2018).

⑵ The implication of loan securitization to China's financial reform

黄益平等(2019) find evidence to suggest that fixed asset investment has been the main driving force of economic growth in China's 40 years of reform and development. The financial system that has successfully supported factor driven growth in the past is now in urgent need of transformation. In recent years, the investment efficiency

indicator ICOR (marginal capital output rate) has increased significantly (from 3.5% in 1985 to 15% in 2017) indicating that China's capital or financial efficiency is declining. The result of the decline of financial efficiency is the increase of financial risk. Now, preventing systemic financial risks has become one of the major reform goals of the government. Securitization can help reduce the systematic financial risk of the banking system by converting long-term infrastructure loans into more effective financial assets.

吴青(1999) and 沈炳熙（2006）argue that through asset securitization, commercial banks convert illiquid loans into cash and then invest in other non-credit financial assets in order to obtain no-interest income (NIR). Asset securitization helps commercial banks reduce the proportion of credit assets so that they not only use credit instruments, but also rely on intermediate business operations, such as participating in the bond markets (treasury bonds, corporate bonds, asset-backed securities, etc.) .

Almazan et al.(2015) remarks that asset securitization can change the dependence of commercial banks on deposits and realize credit expansion. Excessive dependence on deposit financing will leave part of the credit demand unsatisfied, thus reducing economic efficiency. As a new source of capital for commercial banks, securitization can relax the tension between deposits and credit growth.

4.3.2 Hypotheses

⑴Based on previous literature (Zhang et al., 2019), this study proposes five determinants of loan securitization in China’s commercial banks, namely:

1. Liquidity demand

2. Regulatory arbitrage

3. Profitability promotion

4. Risk transfer

5. Cost advantage exploitation

⑵ Based on “the logical road map for China’s financial reform”(黄益平等，2019), this study proposes three implications of loan securitization to China’s financial reform as listed below:

1. Financial efficiency (ICOR)

2. NIR of banks

3. Reliance between credits and deposits

4.3.3 Possible Contributions

Compared with previous studies (Table 4.4), the data of Affinito and Tagliaferri (2010) consists of commercial banks in Italy, and the comparability of the conclusion is low. Most of the samples of Zhang et al., (2019) are non-listed banks, and the data is unaudited and derived from the non-public capital market, reducing the credibility of the analysis. In addition, each bank contains missing data which the author has filled in using linear interpolation, subjecting it to a high degree of error.

This research aims to contribute to the existing literature in six ways. First, the reliability of data is higher. It uses open market data derived from the annual reports of 35 listed Chinese banks, as audited by certified public accountants, with a high degree of reliability. Second, the availability of data is better. The data used is from open market channels where availability is deemed high. The variables used are determined

based on the availability of data (for the list of replacement variables, Table 4.3)[22]. Third, this research supplements the data used by Zhang et al. (2019) and adds 2018-2019 data in order to test the latest changes in China's loan securitization market. Fourth, the study uses the Robustness test of substituting risk variables (Z-score and DtD) to further explore the risk transfer motivation of commercial banks' when engaging in loan securitization. Fifth, the study adds two additional variables in order to carry out a sensitivity analysis to estimate the implication of loan securitization to China's financial reform. Sixth, this research examines the implications of loan securitization on the relationship between credit and deposit.

Table 4.3 Substitution of Variables

Incentive	Variables: In this study (2021)	Variables: In Zhang et al.(2019)
Profitability promotion	CIR = Cost-income ratio = Cost / Income = Operating expenses / revenue	ROL = Return on loans =Pretax profit/Average annual gross loans
Risk transfer	PC = Loan loss provision ratio = Loan loss provisions/Loan (Subprime + doubtful + loss)	LLR = Loan loss provision ratio = Loan loss provisions/Total loan

The author gives five conclusions. First, commercial banks with large assets and low risk tend to securitize their loans[23]. China's asset securitization market does not welcome engagement with small- and medium-scale banks as they are deemed to be rery risky. Second, the incentives of commercial banks to pursue loan securitization arise from profitability promotion and cost advantage exploitation, and thus no longer regulatory arbitrage. Third, the loan securitization has effectively lowered the dependence of credits on deposits. Fourth, the income from securitization continues to

[22] As shown in Table 4.3, the data underlying the ROL and LLR in Zhang et al., (2018) are not disclosed. As such, CIR and PC are used instead in this study.

[23] Here, "large assets" refers to banks with statistical significance, and other banks without statistical significance are collectively referred to as small-and medium-scale banks.

be invested in new loan business rather than to increase NIR. Fifth, little evidence is found that loan securitization improves the investment efficiency of China's financial market.

4.4 Research Methods

4.4.1 previous Research

The research methods in this chapter follow Affinito and Tagliaferri (2010) and Zhang et al. (2019), Table 4.4.

Affinito and Tagliaferri (2010) studied four determinants of loan securitization in 138 commercial banks in Italy during the period of 2000-2006 using logistic panel regression. Zhang et al. (2019) reviewed 155 commercial banks in China as samples from 2012 to 2017 and used factor analysis, logistic and Tobit panel regression methods to study five determinants of loan securitization of commercial banks.

Table 4.4 Previous Research

	Affinito and Tagliaferri(2010)	Zhang et al.(2019)	This Study
Object of analysis	Italian banks	Chinese banks	Chinese banks
Analysis period	2000-2006	2012-2017	2012-2019
Data sources	Bank of Italy's Annual Report, the Bank of Italy's accounting supervisory reports and the Italian Central Credit Register	CBRC annual report, Orbis Bank Focus, China Securitization Analytics, WIND	WIND, China Securitization Analytics
Number of firms	138	155	35
Research hypothesis	Four main determinants: new sources funding, credit risk transfer, profit opportunities; the role of capital	Five main determinants: liquidity demand, regulatory arbitrage, profitability promotion, risk transfer, cost advantage exploitation	Five main determinants: liquidity demand, regulatory arbitrage, profitability promotion, risk transfer, cost advantage exploitation
Securitization index	(1) ABS dummy (2) How much to securitize	(1) ABS dummy (2) How much to securitize	(1)ABS dummy (2) How much to securitize
Model	Logit panel regressions: Log(ABS Yit=1) = f(Xit; Zit)	(1) Factor analysis (2) Logistic panel regressions (3) Tobit panel regressions	(1) Factor analysis (2) Logistic panel regressions (3) Tobit panel regressions

Determinants：			
Funding	-	/	/
Risk transfer	+	/	/
Profit opportunities	-	/	-
Capital adequacy ratio (CAR)	-	-	/
Cost advantage exploitation	/	+	+
Implications:			
Z-score			-
DtD			-
NIR			-
ICOR			+
Credit and deposit			-

4.4.2 Multiple Regression Model

In this chapter, 35 Chinese commercial banks are used to analyze five determinants of bank loan securitization from 2012 to 2019. The research model is as follows, see formula（1）and（2）.

$$P(\text{Sec}_{it} = 1) = \Phi(\sum_j^n \beta_j F_{i,t-1}^j + Control_{i,t-1} + \alpha_i + \delta_t + \mu_{i,t}) \quad (1)$$

The probability distribution function on the left formula（1）is the logistic function. The variable $sec_{i,t}$ is the explained variable, a dummy variable indicating whether the banks engaged in securitization. $F^j_{i,t-1}$ is the explanatory variable, and includes six factors that correspond to five securitization incentives are show below.

$$y_{i,t}^* = \sum_j^7 \beta_j F_{i,t-1}^j + Control_{i,t-1} + \alpha_i + \mu_t + \varepsilon_{i,t} \quad (2)$$

$$y_{i,t}^* = \begin{cases} y_{i,t}^* , y_{i,t}^* > 0 \\ 0 \quad , y_{i,t}^* \leq 0 \end{cases}$$

Formula (2) is a Tobit regression model. It is used to test whether the common factor can further explain the amount of loan securitization. The explained variable $y_{i,t}$ is SEMT, a continuous variable.

4.4.3 Data

(1) Data Source

Raw data is collected from WIND and CSMAR from 2012 to 2019. Thirty-five Chinese listed banks are examined, as shown in Table 4.5.

Table 4.5 Thirty-five Listed Banks in China

Serial Number	Bank Name	Securities Code	Listing Place	Bank Type
1	INDUSTRIAL AND COMMERCIAL BANK OF CHINA	601398	SH	State-controlled
2	AGRICULTURAL BANK OF CHINA	601288	SH	State-controlled
3	BANK OF CHINA	601988	SH	State-controlled
4	CHINA CONSTRUCTION BANK	601939	SH	State-controlled
5	BANK OF COMMUNICATIONS	601328	SH	State-controlled
6	POSTAL SAVINGS BANK OF CHINA	01658	HK	State-controlled
7	CHINA MERCHANTS BANK	600036	SH	National joint-stock
8	SHANGHAI PUDONG DEVELOPMENT BANK	600000	SH	National joint-stock
9	CHINA CITIC BANK	601998	SH	National joint-stock
10	CHINA EVERBRIGHT BANK	601818	SH	National joint-stock
11	HUA XIA BANK	600015	SH	National joint-stock
12	CHINA MINSHENG BANK	600016	SH	National joint-stock
13	INDUSTRIAL BANK CO.,LTD.	601166	SH	National joint-stock
14	PING AN BANK.	000001	SZ	National joint-stock
15	CHINA ZHESHANG BANK	02016	HK	National joint-stock
16	BANK OF BEIJING	601169	SH	Regional
17	CHANGSHU RURAL COMMERCIAL BANK	601128	SH	Regional
18	BANK OF CHONGQING	01963	HK	Regional
19	BANK OF GUIYANG	601997	SH	Regional
20	HARBIN BANK	06138	HK	Regional
21	BANK OF HANGZHOU	600926	SH	Regional
22	HUISHANG BANK	03698	HK	Regional
23	BANK OF JIANGSU	600919	SH	Regional

24	JIANGYIN RURAL COMMERCIAL BANK	002807	SZ	Regional
25	BANK OF JINZHOU	00416	HK	Regional
26	BANK OF NANJING	601009	SH	Regional
27	BANK OF NINGBO	002142	SZ	Regional
28	BANK OF QINGDAO	03866	HK	Regional
29	BANK OF SHANGHAI	601229	SH	Regional
30	SHENGJING BANK	02066	HK	Regional
31	WUXI RURAL COMMERCIAL BANK	600908	SH	Regional
32	WUJIANG RURAL COMMERCIAL BANK	603323	SH	Regional
33	RURAL COMMERCIAL BANK OF ZHANGJIAGANG	002839	SZ	Regional
34	BANK OF ZHENGZHOU	06196	HK	Regional
35	GUANGZHOU RURAL COMMERCIAL BANK	01551	HK	Regional

Source: WIND and CSRC website

According to the bank classification standard of China Banking and Insurance Regulatory Commission (CBIRC), there were 6 large state-controlled commercial banks (No.1 to No.6), 9 national joint-stock commercial banks (No.7 to No.15), and 20 regional commercial banks (No.16 to No.35).

⑵ Data Processing Method

1. Banks with limited data available were eliminated;

2. The characteristic variables of commercial banks lag 1-year from the annual data from 2012 to 2019;

3. The impact of different years was considered; and

4. Different companies are clustered to consider the standard error within the group.

4.4.4 Variables Selection

The dependent variable for the Logit regression is a binary variable. During the observation period, if the commercial bank issues a securitized loan, the value is 1, otherwise it is 0. The dependent variable for the Tobit regression is the issue amount of

loan securitization. Eight original explanatory variables were selected according to previous literature and divided into five independent components (Table 4.6 for a description of the variables).

Table 4.6 Variables Descriptions

Variable			Variable Definition and Calculation Method
Explained variables		SEC	The commercial banks' loan securitization decisions = dummy variable indicating whether the banks securitized or not. If issued, it's 1,otherwise it's 0
		SEMT	The total amount of loan securitizations issued by the banks
Explanatory variables	Liquidity demand	LR	Liquidity ratio = Liquid assets / Liquid liabilities
	Regulatory arbitrage	CAR	Capital adequacy ratio = Net capital/Total risk-weighted assets
	Profitability promotion	CIR	Cost-income ratio = Cost/Income/ Operating expenses/Revenue
		ROA	Return on assets = Pretax profit/Total annual assets
	Risk transfer	NPL	Non-performing loan ratio = non-performing loan/Total loan
		PC	Loan loss provision ratio = Loan loss provisions /Loan（Subprime + doubtful + loss）
	Cost advantage exploitation	LNA	The logarithm of the book value of total assets = Ln (Total assets)
		MLR	Mortgage rate = Mortgage / Total loan
Control variables		LNM	Ln(M2)
		LNG	Ln(GDP)
		LDR	Loan-deposit ratio = Total loan / Total deposit
Alternative risk measures		Z-core	Natural log of a bank's ratio of the sum of equity capital to total assets and the return on average assets before taxes (ROAA) to the standard deviation of ROAA per semi-year.
		DtD	DtD = (Asset value - default point)/(Asset value × asset return volatility)
Implication of loan securitization to financial reform			
Regulatory and institutional environment		NIR	Non-interest income = Operating income - Interest income
		ICOR	Incremental capital output ratio= I/△GDP = Gross fixed capital formation / GDP increment
The reliance on deposit and loan		Credit-growth	Current loan increment / Opening loan balance
		Deposit-growth	Current deposit increment / Opening deposit balance

Source: WIND and CSMAR

The liquidity demand incentive depends on the liquidity ratio (LR) and states that commercial banks will transform illiquid loans into liquid assets through securitization

(Almazan et al., 2015). A low liquidity ratio implies that the current assets of commercial banks are not sufficient to match their current liabilities, improving the liquidity demand incentive of commercial banks.

The regulatory arbitrage incentive is represented by CAR. Regulation arbitrage occurs when commercial banks transform high-risk-weighted loans into low-risk-weighted securities through securitization in order to release capital. Calem and LaCour-Little (2004) and Ambrose et al. (2005) all find evidence to support this theory. A lower CAR will stimulate commercial banks to supplement capital, reduce risk weighted assets, and improve regulatory arbitrage incentives through loan securitization.

The incentive of profitability promotion depends on the cost-income ratio (CIR[24]) and return on assets (ROA). Profitability promotion occurs when commercial banks optimize their loan structure through securitization and convert low-return loans into high-return loans to improve their performance (Cardone - Riportella et al., 2010). A higher CIR and lower return on assets will improve the profitability promotion incentive.

Risk transfer incentive relies on the non-performing loan ratio (NPL) and loan loss provision ratio (PC). Risk transfer entails that commercial banks will sell loans with high default risk through securitization to improve the quality of the assets in their portfolio. Indeed, Agarwal et al., (2012) and DeMarzo and Duffie (1999) find evidence supporting this hypothesis. A higher NPL and lower loan loss PC means that commercial banks have higher default risk, which increases the bank's risk transfer incentive from loan securitization.

[24] CIR = Cost-income ratio = Cost/Income = Operating expenses/Revenue. In this research, "operating expenses" does not include the "impairment losses of assets".

The incentive of cost advantage exploitation depends on the mortgage rate (MLR) and natural logarithm of bank assets (LNA). Cost advantage exploitation refers to the demand of commercial banks to reduce the cost of loan securitization by expanding the scale of issuance, also known as “scale economy”. The cost of loan securitization includes fixed costs and variable costs. Fixed costs are related to the bank’s scale. The larger the bank’s scale, the lower the fixed cost of the asset’s securities (Bensalah and Fedhila, 2016). Variable costs are related to the asset structure of commercial banks. The main assets that commercial banks can securitize are loans. The difficulty and cost of mortgage securitization is less than other forms of loan securitization. The higher the proportion of the mortgage as part of the total loan, the lower the variable cost. The higher the asset scale and MLR, the greater the incentive of commercial banks have to pursue cost advantage exploitation.

Z-score is a multivariate financial formula (Altman, 2000), which is used to measure the financial distress and bankruptcy risk of an enterprise. Because the variable is mostly the financial ratio of the listed company's financial report, it is considered an accounting-based measure of a bank's overall risk exposure. In short, a lower Z-score represents a higher bankruptcy risk (Farruggio, C., and Uhde, A., 2015).

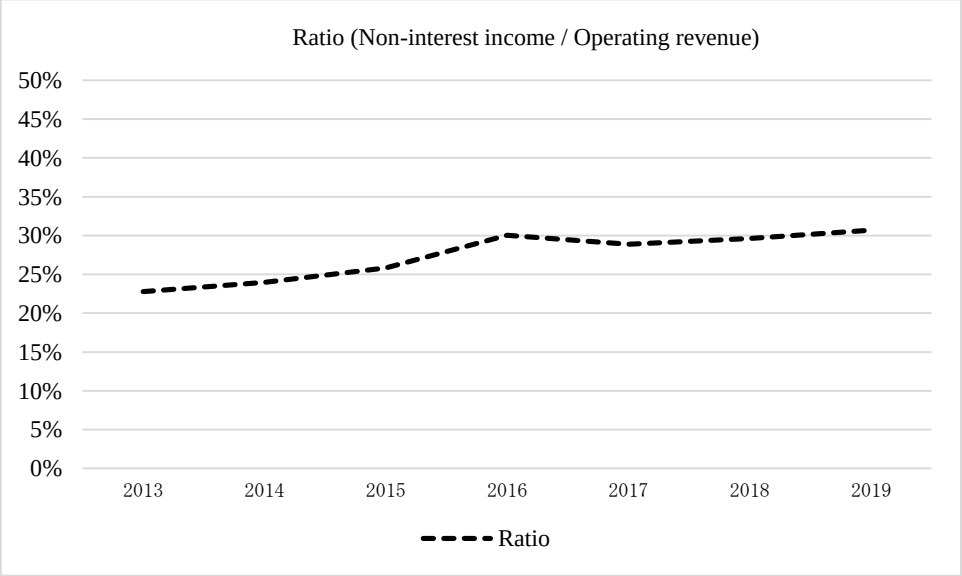
DtD, distance-to-default, is a market-based measure of a bank’s overall risk exposure. It is the difference between the market value of the company's assets and liabilities at a certain time point. It is designed to indicate the number of standard deviations that the bank is away aware of from the default point within a given time horizon. Here too, in short, a lower DtD value represents a higher default risk (Merton, 1974). The calculation process for the variables Z-score and DtD are shown in the Appendix.

NIR of banks

NIR is equal to operating income minus interest income. It is mainly the income from intermediary business and consulting and investment activities. In terms of the income structure of banks in China, interest income accounts for nearly 80% of operating income (Figure 4.2). However, interest income is greatly affected by interest rate changes and the economic cycle, and the risk of bad loans are high. In recent years, domestic banks have begun to increase investment in NIR business, which is relatively stable, safe and usually has higher profit margins.

ICOR, is the marginal capital output rate. ICOR reflects how many units of investment are needed for one unit of GDP growth. Therefore, the larger the marginal capital output rate, the lower the investment efficiency. Conversely, the smaller the marginal capital output rate, the higher the investment efficiency.

Figure 4.2 Ratio of the Non-interest Income to Operating Revenue of Banks



Source: WIND

4.5 Descriptive Statistics

The statistical characteristics of the original explanatory variables are shown in Table 4.7. The symbol in parentheses after the variable indicates the theoretical hypothesis of the variable's influence direction on the incentives of a bank to pursue loan securitization. The result shows the means and standard deviations of each proxy variable in two subsamples (securitized and un-securitized), and reflects whether the mean of the two subsamples is significantly different under a t-test. In general, the differences between the sub-samples of securitization and non-securitization are consistent with the results of earlier previous theoretical analyses.

Table 4.7 highlights the direction of influence of the aforementioned variables on bank loan securitization incentives. Through the analysis of the above variables, we make the following hypotheses: (1) The decrease in liquidity ratio will increase the liquidity incentive of bank securitization; (2) The reduction of the CAR will increase the regulatory arbitrage incentive of bank securitization; (3) The increase of the CIR will strengthen the incentive of bank performance improvement, whilst the increase in return on assets will weaken the incentive; (4) The increase in the NPL will enhance the risk transfer incentive, whilst the increase in the loan loss PC will diminish the incentive; (5) The increase in bank asset scale and MLR will have a positive impact on the cost advantage exploitation incentive. (6) The decrease of Z-score and DtD will enhance the risk transfer incentive.

Table 4.7 The Statistical Characteristics of the Original Explanatory Variables

Variable	Securitized Sample		Un-securitized Sample		Diff	
	Mean	Std Dev	Mean	Std Dev	T-statistic	Std Dev
LR(-)	48.8439	19.1389	48.0182	22.7805	+0.8257	2.1472
CAR(-)	12.4543	2.9433	12.3821	2.7527	+0.0721	0.2743
CIR(+)	28.3022	5.8761	28.3004	7.3258	+0.0018	0.6632
ROA(-)	0.9025	0.6633	1.2552	1.1554	-0.3526***	0.0960
NPL(+)	1.3822	0.3656	1.3688	0.7114	+0.0133	0.0585
PC(-)	223.1765	80.3811	243.5114	84.6875	-20.3349**	8.1609
LNA(+)	29.0562	1.3484	27.4000	1.4883	+1.6562***	0.1404
MLR(+)	0.1882	0.0608	0.1785	0.0525	+0.0097*	0.0054
Z-score(-)	0.1104	0.0285	0.0929	0.0371	+0.0175***	0.0033
DtD(-)	39.9969	128.9407	60.5987	54.6729	-20.6018**	10.0821
NIR(-)	0.2850	0.0940	0.2007	0.1036	+0.0843***	0.0109
Credit-growth(+)	0.1162	0.1566	0.1424	0.1757	0.0262	0.0168
Domestic growth(-)	127.2698	1,169.0920	0.1903	0.2292	+127.0794*	75.4265

Note: The symbols ***,**,*, indicate confidence levels of 1%, 5% 10%, under t-test, respectively. The symbol in parentheses after the variable indicates the theoretical hypothesis of the variable's influence direction on the incentives of a bank to pursue loan securitization.
Source: WIND and CSMAR

Here, as part of the above six forms, we also make two additional hypotheses about the direction of loan securitization implication on China's financial reform: (7) The increase of a bank's NIR will reduce their tendency to engage in loan securitization; (8) The increase of credit growth will not affect the deposit growth of securitizing banks but will decrease the deposit growth of un-securitizing banks in contrast.

4.6 Regression Analysis

4.6.1 Correlations of Variables and Factor Analysis

KMO and Bartlett's tests are used to examine the correlation between variables.

The result of the KMO test is 0.504, which is higher than 0.5, indicating that the correlation between variables is close to the average value. Bartlett's test value is 254.448 and the confidence level is 0.1%，indicating that there is a correlation between variables. Therefore, the factor analysis method is appropriate to use.

Principal component analysis is used to extract six factors as explanatory variables for regression analysis. The relationship between the six factors and their proxy variables are shown in Table 4.8. Loadings, whose absolute values are greater than 0.5, are highlighted in bold. The economic meaning of each factor is primarily related to variables with a large factor loading. F1 refers to a high loan risk factor, which corresponds to a risk transfer incentive for the variables of NPL and PC. F2 is special for its large loading of ROA. ROA is a proxy variable of the profitability promotion incentive. F3 is called the large-scale factor, corresponding to the cost advantage exploitation incentive and the proxy variable is LNA. F4 is called the high cost-to-income ratio factor and corresponds to the profitability promotion incentive and represents the proxy variable CIR. F5 is called the high CAR factor with the large loading variable CAR and represents the incentive of regulatory arbitrage. F6 refers to the high liquidity factor and corresponds to the liquidity demand incentive, its proxy variable is LR. MLR has not been included in the six factors because its loading is less than 0.5. One possible explanation of this condition is that China's financial market regulations have focused on the real estate market bubble since 2019, which has led to a serious decline in the amount of real estate mortgage loans.

Table 4.8 Factor Loading Matrix After Varimax

Initial explanatory variables	F1	F2	F3	F4	F5	F6
	High Loan Risk	High ROA	Large Scale	High cost-to-Income Ratio	High Capital Adequacy Ratio	High liquidity
LR	.022	-.074	-.077	-.001	.014	**.985**
CAR	.021	.029	.013	-.035	**.963**	.015
CIR	.101	-.018	-.110	**.947**	-.015	.000
ROA	.136	**.954**	-.004	-.017	.053	-.077
NPL	**-.836**	-.191	-.141	-.152	.094	-.150
PC	**.878**	-.026	-.183	-.037	.055	-.101
LNA	-.021	-.003	**.951**	-.108	.037	-.079
MLR	-.277	.359	.364	.371	.449	-.009

Source: WIND and CSMAR, and China Securitization Analysis database
Note: Values with an absolute value greater than 0.5 are shown in bold

4.6.2 The Logit Regression

Table 4.9 Column（1）contains the full sample Logit regression result examining the influence of determinant factors on the securitization frequency of commercial banks.

First, the coefficient of factors “High ROA”(-0.4669***) and “Large scale”(LNA，1.4164***) are significant, and their direction is consistent with the incentive hypotheses of profitability promotion and cost advantage exploitation, indicating that the hypotheses are supported in practice. Banks with large scale assets, and banks with poor profitability tend to carry out loan securitization. Second, the coefficient of other factors, such as “High loan risk”(NPL and PC, 0.2436), “High cost-to-income ratio” (CIR， 0.0260), “High capital adequacy ratio” (CAR, 0.1497) and “High liquidity” (LR， 0.2860), are not significant, which means the hypotheses are not supported in

practice. The coefficient's direction of factors "High capital adequacy ratio" （CAR） and "High liquidity"（LR） are not in line with the previous hypotheses, indicating that Regulatory arbitrage and Liquidity demand are not the influential drivers for loan securitization.

Table 4.9 Estimation for the Determinants of Loan Securitization

	(1)	(2)
VARIABLES	**SEC**	**SEMT**
High loan risk	0.2436	42.7256
	(0.3142)	(26.1926)
High ROA	-0.4669***	51.2698*
	(0.1724)	(30.8588)
Large scale	1.4164***	190.0042***
	(0.2579)	(31.6312)
High cost-to-income ratio	0.0260	47.4514**
	(0.1682)	(20.3425)
High capital adequacy ratio	0.1497	-5.5449
	(0.1243)	(24.1752)
High liquidity	0.2860	7.1754
	(0.1867)	(18.9323)
LDR	0.4729	-43.3061
	(1.5506)	(175.8789)
lnM2	4.7124	190.5962
	(6.8316)	(366.0339)
ln GDP	0.2805	299.7707
	(5.6603)	(288.6044)
Constant	-72.0058**	-6,518.9082***
	(34.8509)	(2,183.1051)
Observations	418	418
Number of idc	36	36
Likelihood-ratio test of rho=0	16.71	
Prob	2.18e-05	
Log likelihood		-1153
Wald chi2		17.49

Source: WIND and CSMAR, and China Securitization Analysis database
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

To sum up, based on the hypothesis of the five determinants (section 4.2.3) proposed in this study, the results of the empirical analysis support the hypotheses of

profitability promotion and cost advantage exploitation. The incentives of liquidity demand, regulatory arbitrage, and risk transfer are not supported.

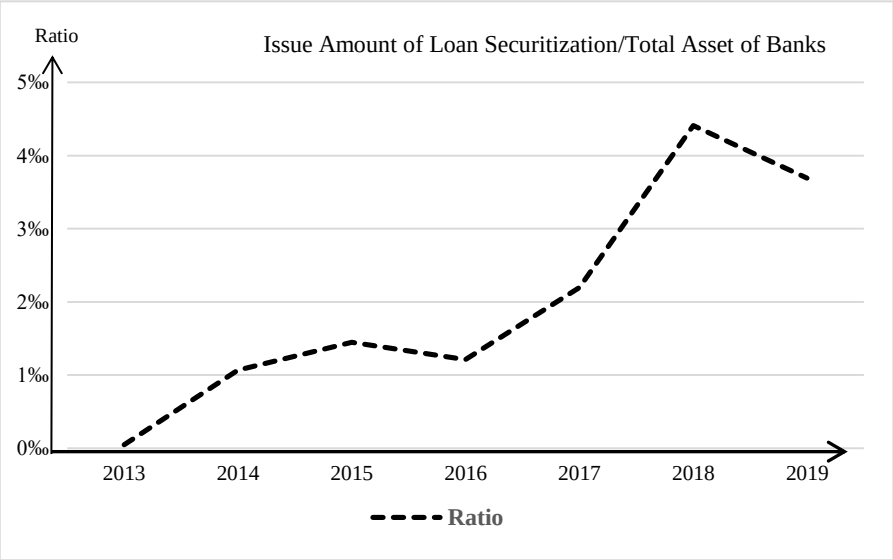
Compared with the result of Zhang et al. (2018), as shown in Table 4.3, both studies share the same incentive of cost advantage exploitation (Large scale). However, Zhang et al., (2018) concludes that CAR is a key incentive whilst this thesis concludes that the Profitability promotion (ROA) is the primary incentive. A possible explanation for the discrepancy is that the capital source of China's commercial banks has improved after 2017. The main incentive for banks to pursue loan securitization is no longer to supplement capital, but to improve performance.

4.6.3 The Tobit Regression

We use the Tobit regression method to further verify the influence of decision factors on the securitization amounts of commercial banks.

As shown in Column (2) of Table 4.9., the coefficient of variable “Large scale”(190.0042***) and “High cost-to-income ratio”(47.4514***) are significant and positive, which further verify the results from the Logit regression in Column (1) of Table 4.9, and support the incentive hypotheses of Cost advantage exploitation and Profitability promotion. The direction of “High ROA” (51.2698*) is positive, contrary to the hypothesis. One explanation of this inconsistency is that the amount of securitization is much smaller, which affects the accuracy of some Tobit regression coefficients. The data in Figure 4.1 and Figure 4.3 also support this viewpoint.

Figure 4.3 Ratio of the Issuance of Loan Securitization to Total Assets of Commercial Banks



Source: WIND

4.6.4 Robust Test

Some special regression methods are used to test whether the results in Tables 8 are robust or not.

(1) Subgroup Regression

According to the assets scale and time period of banks, the samples are divided into two groups, as shown in Table 4.10 Robust test A. Type I consists of fifteen national commercial banks, including six state-controlled banks and nine joint-stock banks and Type II consists of twenty regional commercial banks. We use time period dummy variables to mark periods before and after the “Filing System”. To remove the endogenous effects, we use one-year lagged explanatory variables to regress.

The results of Table 4.10 verify that the estimation for bank’s securitization determinants in Table 4.9 is fundamentally robust.

Table 4.10 Robustness Test A—Grouping Regression

VARIABLES	(1) Type I	(2) Type II	(3) 2012-2014	(4) 2015-2019
	SEC	SEC	SEC	SEC
High loan risk	-0.1971	0.6705**	0.0881	0.4466
	(0.5255)	(0.3234)	(0.5553)	(0.3381)
High ROA	-0.1612	-0.6807**	-0.3114	-0.5839*
	(0.3293)	(0.2830)	(0.2207)	(0.3451)
Large scale	1.3209**	-0.0828	0.7361**	1.7286***
	(0.6202)	(0.6594)	(0.3682)	(0.3434)
High cost-to-income ratio	0.5523*	-0.6841**	-0.4419	0.4723*
	(0.2949)	(0.3159)	(0.2851)	(0.2686)
High capital adequacy ratio	0.3275	0.1740	-0.6308*	0.2875*
	(0.2535)	(0.4118)	(0.3504)	(0.1474)
High liquidity	0.8121***	-0.1068	0.4570	0.3484
	(0.2883)	(0.2503)	(0.3527)	(0.2730)
LDR	-0.8975	0.7882	0.3589	1.2601
	(2.9051)	(1.9371)	(2.3971)	(1.6659)
lnM2	11.8015	15.4403	0.3245	8.4184
	(12.2957)	(16.5524)	(7.9951)	(10.0499)
ln GDP	-6.1546	-4.2321	11.4185*	-4.8111
	(10.5035)	(9.3093)	(5.8736)	(6.7502)
Constant	-93.1253*	-172.8509	-140.8985*	-62.9540
	(54.5101)	(243.2080)	(81.0994)	(67.9615)
Observations	201	214	97	321
Number of idc	16	20	34	36
Likelihood-ratio test of rho=0	4.894	10.10	1.53e-05	20.69
Prob	0.0135	0.000741	0.498	2.70e-06

Source: WIND , CSMAR and China Securitization Analysis database
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

(2) Substitution of Variable Regression

The result in Table 4.9 does not support the incentive of risk transfer. This author replaced factor F1(High loan risk, consistent with NPL and PC) with variables Z-score and DtD to test whether the result is robust. The estimation result is shown in Table 4.11. Variables Z-score and DtD are both used to measure a bank's overall risk positions. The difference is that Z-score represents the risks from the bank's accounting statement, and DtD represents the listed banks' overall risk exposures from the stock market.

The coefficient of variable 'Large scale' in Column (1) and Column (2) are 1.3209** and -0.0828 respectively, and 'High ROA's' coefficient is -0.1612 and

-0.6807**, which suggests that only large banks (which own more loans) are incentivized to pursue cost advantage exploitation, and that small banks are more eager to improve their performance through loan securitization. Coefficients in Column (3) and (4) indicate that the incentive of cost advantage exploitation consistently works during the two periods and is not affected by the “Filing System”. The incentive factors of performance promotion (variables of High ROA and High cost-to-income ratio) do not work (-0.3114 and -0.4419) until after the “Filing System” (-0.5839* and 0.4723*), suggesting that the implementation of the “Filing System” results in the determinants of loan securitization of commercial banks arising from the commercial banks themselves instead of from supervision. The coefficient of High loan risk in Column (2) is 0.6705**, signifying that small banks have an incentive to transfer risk through non-performing loan securitization.

The coefficient of Z-score is 9.7690*, indicating that the risk transfer incentive of commercial banks is weak, with the risks mainly arising from an accounting statement perspective. The coefficient of DtD is 0.0041**, positive and significant, which means that banks with lower overall risk exposure to the stock market tend to pursue loan securitization. Moreover, in Column (2), considering the stock market risk, the coefficients of the variables "High capital adequacy ratio" and "High liquidity" are significant (0.2905** and 0.5816***), but the directions are not in line with the previous hypotheses which indicates that liquidity demand and regulatory arbitrage are not the motivations of loan securitization for listed commercial banks. The coefficient of variable large scale is 1.2918*** and 1.5148*** in Column (1) and Column (2), showing that the incentive of Cost advantage exploitation is still significant.

Table 4.11 Robustness Test B—Substitute for Risk Variables

VARIABLES	(1)	(2)
	SEC	SEC
Z-score	9.7690*	
	(5.7798)	
DtD		0.0041**
		(0.0019)
High ROA	-0.1375	-0.1829
	(0.2099)	(0.2335)
Large scale	1.2918***	1.5184***
	(0.1988)	(0.2779)
High cost-to-income ratio	0.0617	0.2193
	(0.1740)	(0.1967)
High capital adequacy ratio	0.1994	0.2905**
	(0.1537)	(0.1297)
High liquidity	0.3406*	0.5816***
	(0.1884)	(0.2027)
LDR	2.2643*	2.8173*
	(1.2989)	(1.5488)
lnM2	4.8374	9.6041
	(6.4319)	(6.0825)
lnGDP	-1.2227	-4.4986
	(5.4511)	(5.0458)
Constant	-57.6198*	-85.1826**
	(30.9173)	(33.4806)
Observations	400	338
Number of idc	36	35
Likelihood-ratio test of rho=0	13.72	17.28
Prob	0.000106	1.61e-05

Source: WIND and CSMAR, and China Securitization Analysis database
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

To sum up, based on the result of Robustness test B in Table 4.11, the incentives of loan securitization of listed banks are cost advantage exploitation and risk transfer. In other words, the risks relate to the overall risk arising from the stock market rather than NPL.

4.6.5 Sensitivity Analysis

In order to test the impact of bank loan securitization on China's financial reform, this author designed the sensitivity analysis in Table 4.12. According to the hypothesis

proposed in 4.2.3, two variables were selected, ICOR (incremental capital output rate, financial market level variable) and NIR. Loan securitization can activate the stock capital, reduce ICOR, and improve financial efficiency; Loan securitization can also transfer interest income the off-balance sheet to increase NIR in order to improve the income structure of commercial banks and reduce the overall risk of banks. In Table 4.12, the explained variable is SEC. The results show that the coefficients of NIR and ICOR were -1.9301 and 0.0532, and the directions are consistent with the previous hypothesis, but not significant. Further, the above results suggests that the role of China's loan securitization in financial reform is very limited. A potential reason for this limitation is that the amount of loan securitization of commercial banks is not large enough and has little influence on the financial market. After carrying out grouping regression of NIR and ICOR, the coefficients are still not significant, which further verifies the aforementioned conclusion. The data in Figure 4.2 supports this explanation, too. Since 2013, the proportion of loan securitization issuances as a proportion of total bank assets has only reached 0.45% (in 2018).

4.6.6 Estimating the Relation between Credit and Deposit

The results of literature research show that the relationship between deposit and credit growth is less intense after banks securitize (Loutskina, 2011; Almazan, 2015). Therefore, this study intends to further test whether China's loan securitization can alleviate the dependence of bank loans on deposits, thus reducing the financial risk of the banking system, or not. Table 4.13 is used to estimate the impact of securitization on bank loans on deposit dependence. The coefficient of deposit-growth in Column (1) and (6) are -0.0000 and -0.2196** respectively, indicating that in general, the dependence of

non- securitized banks on loans and deposits is significant. Securitization does reduce the dependence of bank loans on deposits and alleviates the credit risk of commercial banks. The coefficient of deposit-growth in Column (2) and (5) are -0.4537** and -0.4309**, indicating that although loan securitization has been implemented, small banks and banks before the “Filing System” still rely heavily on deposits. This could be because loan securitization of China's commercial banks is still in its infancy, and the securitization scale of small banks is too small to have a broader impact. In the un-securitizing banks, deposits are generally highly dependent on loans (-0.2196**). Only the large banks have sufficient sources of deposits, and their dependence has decreased (-0.1267). For banks after 2015, the coefficient of deposit- growth is 0.2295**, which is positive and significant, indicating that the current operation and management strategies of commercial banks include not only loan securitization, but also an active asset liability management strategy.

4.7 Conclusions

By the end of 2019, Chinese banks with large assets and low return on assets tended to securitize their loans. The empirical results of the Logit expression and Tobit expression confirm this conclusion, which is consistent with previous research findings. Through the regression test of the samples grouped by bank size and time period, the results are fundamentally robust. The robustness test of substituting risk variables shows that the banks with lower risk tend to engage in asset securitization. This finding verifies the robustness of the results in Table 4.9.

This study designs sensitivity analysis and loan deposit dependence estimation to test the impacts of asset securitization on China's financial reform. The results of the

sensitivity analysis show that the direction of coefficients NIR and ICOR are consistent with the previous hypothesis, but not significant. Further, it shows that the effects of loan securitization on improving financial efficiency and optimizing bank income structure are not obvious. One possible explanation of this observation is that the issuances of loan securitization are small, and thus its influence on the banking system and financial market is not significant enough. The data in Figure 4.1 and Figure 4.2 support this explanation. The estimation of the relationship between credit and deposit growth shows that deposit and credit growth is less intense after banks are able to securitize (the coefficients of Deposit-growth in Column (1), (3) and (4) are -0.0000); On the other hand, the effect is limited in small banks (coefficient is only -0.4309***). This could be due to the fact that small banks have limited sources of funds and their loans are highly dependent on consistent and timely deposits. Although there are some loan securitization operations, the effect is very limited. Besides, banks with small asset amounts are not popular in China's asset securitization market.

To sum up, China's loan securitization market welcomes large banks with lower risks rather than small-scale banks which tend to have higher risks. The external policy driven factor is being replaced by the internal performance demand after the issue of the "Filing System" and accompanied by the maturity of the asset securitization market. Default risks of listed banks themselves rather than that of loan customers affect's the bank's loan securitization decision more. The spread business of indirect financing is still the most profitable and the safest investment choice in China's financial market. Loan securitization has indeed improved the credit-deposit relationship of banks but has not played a significant role in improving the income structure and reducing the risk of commercial banks. China's financial reform is a huge, complex and far-reaching project,

which requires the cooperation and efforts of the government and financial markets in an all-round way. The loan securitization market should be developed continuously and rapidly, which has great implications on China's financial reform.

4.8 Limitations of the study

⑴The empirical research in this chapter does not involve heterogeneity and endogeneity, and the results of the study have certain limitations.

⑵The 35 samples in this study are listed banks in the Chinese securities market. Their financial reports have been audited by certified public accountants and the China Securities Regulatory Commission. The availability and reliability of the data are relatively high. Among the 155 samples used by zhang et al. (2019), 77.4% of them are non-listed banks. Most of its data sources are non-public channels, and the availability is low. The annual reports of the sample banks may not have been audited by a certified public accountant or reviewed by the China Banking Regulatory Commission, and the reliability is also low. Nevertheless, this study uses fewer samples, which may affect the stability and universality of the empirical results.

Table 4.12 Sensitivity Analysis

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total SEC		Type I SEC		Type II SEC		2012-2014 SEC		2015-2019 SEC	
NIR	-1.9301		-1.2611		-1.2611		-9.3652**		0.0856	
	(1.5443)		(2.3892)		(2.3892)		(3.9080)		(1.7440)	
ICOR		0.0532		0.0600		-0.0609		2.0307		-0.1533
		(0.0977)		(0.1293)		(0.1512)		(2.0391)		(0.1132)
High loan risk	0.0172	0.0709	0.1291	-0.6395	0.1291	0.6662**	0.7794	0.0881	0.5873	0.4272
	(0.3303)	(0.2752)	(0.5598)	(0.3989)	(0.5598)	(0.2834)	(0.9443)	(0.5553)	(0.3743)	(0.3042)
High ROA	-0.1055	-0.2887*	-0.1226	-0.0493	-0.1226	-0.5487**	-0.0288	-0.3114	-0.3656	-0.4990*
	(0.1308)	(0.1504)	(0.3121)	(0.3345)	(0.3121)	(0.2457)	(0.2568)	(0.2207)	(0.2539)	(0.3000)
Large scale	1.2775***	1.2680***	0.8839	0.9846*	0.8839	0.1322	0.6147	0.7361**	1.9151***	1.6777***
	(0.2523)	(0.2281)	(0.5990)	(0.5724)	(0.5990)	(0.5833)	(0.3963)	(0.3682)	(0.3228)	(0.3164)
High cost-to-income ratio	0.2929*	0.1710	0.5807**	0.5485**	0.5807**	-0.4736*	-0.4842	-0.4419	0.6249***	0.3788*
	(0.1697)	(0.1549)	(0.2565)	(0.2416)	(0.2565)	(0.2612)	(0.3279)	(0.2851)	(0.1975)	(0.2187)
High capital adequacy ratio	0.1965	0.1674	0.4181	0.4040*	0.4181	0.3268	-0.3019	-0.6308*	0.6087	0.2879**
	(0.2865)	(0.1150)	(0.4721)	(0.2229)	(0.4721)	(0.3487)	(0.3642)	(0.3504)	(0.3816)	(0.1408)
High liquidity	0.4045*	0.1653	1.1456***	0.8055***	1.1456***	-0.3011	0.6147	0.4570	0.6123**	0.3782
	(0.2140)	(0.1774)	(0.2999)	(0.2641)	(0.2999)	(0.2208)	(0.4555)	(0.3527)	(0.3054)	(0.2698)
LDR	-0.8907	-0.3045	-6.2704	-2.4655	-6.2704	0.0576	8.1205**	0.3589	-0.0854	1.3088
	(2.2060)	(1.5411)	(3.9281)	(2.5505)	(3.9281)	(1.7996)	(4.0695)	(2.3971)	(1.5800)	(1.6016)
lnM2	3.7776	5.3361**	9.4401*	6.4603	9.4401*	1.1415	4.4446	-31.7187	-1.4845	-3.2400
	(2.9758)	(2.6426)	(5.0046)	(4.3268)	(5.0046)	(4.2728)	(7.0764)	(38.3423)	(5.6653)	(5.5006)
lnGDP	-0.4167	-2.1681	-0.9218	-1.2286	-0.9218	-2.0602	11.5267**	14.8101*	2.2702	1.3637
	(2.0997)	(1.8249)	(3.8417)	(3.4261)	(3.8417)	(3.2986)	(5.5627)	(8.3330)	(3.5354)	(3.2558)
Constant	-46.7583**	-50.1747**	-116.7401***	-75.6062**	-116.7401***	7.2479	-197.2172*	254.0764	-6.4994	28.9040
	(22.8295)	(21.8164)	(36.0789)	(30.5798)	(36.0789)	(29.5565)	(103.3654)	(442.6341)	(44.4418)	(44.4387)
Observations	327	418	182	201	182	217	83	97	244	321
Number of idc	25	36	13	16	13	20	25	34	25	36
Likelihood-ratio test	10.19	14.04	0.948	5.741	0.948	7.533	9.52e-06	1.53e-05	9.922	18.66
Prob	0.000707	8.95e-05	0.165	0.00829	0.165	0.00303	0.499	0.498	0.000816	7.79e-06

Source: WIND and CSMAR, and China Securitization Analysis database

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4.13 Estimation of the Relation between Credit and Deposit

	Securitizing Bank					Un-Securitizing Bank				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	Total Credit Growth	2012-2014 Credit Growth	2015-2019 Credit Growth	Type I Credit Growth	Type II Credit Growth	Total Credit growth	2012-2014 Credit Growth	2015-2019 Credit Growth	Type I Credit Growth	Type II Credit Growth
Deposit-growth	-0.0000	-0.4537**	-0.0000	-0.0000	-0.4309***	-0.2196**	-0.5139***	0.2295**	-0.1267	-0.2840**
	(0.0000)	(0.1608)	(0.0000)	(0.0000)	(0.1121)	(0.0968)	(0.0713)	(0.0866)	(0.1252)	(0.1218)
lnGDP	-0.3539***	0.0820	-0.0621	-0.2980***	-0.1659	-0.4794***	-0.4968	-0.1111	-0.6666**	-0.4034***
	(0.0807)	(0.2953)	(0.0450)	(0.0835)	(0.1404)	(0.0891)	(0.3080)	(0.0890)	(0.2254)	(0.1070)
LnM2	0.6351***	0.9923	0.0955	0.5554***	0.2988*	0.6847***	0.8151*	0.0466	1.1330***	0.6011***
	(0.1394)	(0.7596)	(0.0668)	(0.1340)	(0.1686)	(0.1574)	(0.4313)	(0.2019)	(0.3172)	(0.1799)
LDR	-0.0268	-1.1062	0.0446	-0.0547	-0.2307	0.4046	0.0434	0.6427**	-0.2396	0.4922
	(0.1524)	(0.7786)	(0.1071)	(0.1168)	(0.3181)	(0.2580)	(0.6590)	(0.2491)	(0.3169)	(0.2877)
Constant	-4.6032***	-13.9697	-0.5001	-4.1253***	-1.9120	-4.0105***	-5.3141	0.4045	-7.7041***	-3.7630**
	(1.1873)	(8.2264)	(0.6953)	(1.0624)	(1.4480)	(1.4196)	(4.3896)	(1.9347)	(2.3594)	(1.5832)
Time dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	170	31	139	128	42	235	46	189	70	165
Number of idc	31	18	29	16	15	35	24	34	15	20

Source: WIND and CSMAR, and China Securitization Analysis database
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

5 ASSET SECURITIZATION DECISION BY NON-FINANCIAL COMPANIES

5.1 Introduction

Asset securitization with non-financial enterprises as originators, accounts receivable and future claims as underlying assets and issued in Shanghai and Shenzhen stock exchanges is an important part of China's asset securitization market. It will expand direct financing sources and reduce the dependence of enterprises and local governments on bank loans, reduce financial leverage and capital cost, adjust the structure of assets and realize the strategy of light assets (张明等, 2013; 朱荃等, 2019). Because the profit model of non-financial enterprises is quite different from that of commercial banks and the cash flow characteristics of the underlying assets are also different, the former literature usually studies these two types of asset securitization separately. This research focuses on asset securitization of non-financial enterprises, and takes research samples of non-financial enterprises within the Shanghai and Shenzhen stock exchanges to conduct an empirical research.

The following three questions will be addressed.

(1) Under the background of supply side reform, will the financial factors affect the decision of asset securitization change?

(2) Does the form of ownership affect the decision of asset securitization?

(3) Does the asset securitization decision of a company have specific credit rating characteristics?

The reminder of this chapter presents the research design, the third and fourth part

is the empirical analysis and conclusions and suggestions, respectively.

5.2 Literature Review

5.2.1 Literature Review on Theory

The theoretical research on the motivation of asset securitization focuses on whether securitization can bring economic benefits to enterprises or not.

Asset securitization and friction costs. Minton et al. (1997) believes that enterprises choose asset securitization instead of issuing corporate bonds in order to avoid friction costs in issuing unsecured bonds. These friction costs come from the principal-agent and information asymmetry in financing contracts. In the asset-backed securitization financing model, the Special Purpose Vehicle (SPV) issues bonds backed by pooled assets. The degree of information asymmetry of collateral value is far less than that of company value. As investors prefer bonds with collateral, companies facing severe information asymmetry are more likely to issue secured debt, such as securitization, for the cost of funding.

Asset securitization and financial distress. After analyzing the American ABS market, Minton et al. (1997), Yamazaki (2005) and Riachi et al. (2015) argue that companies in financial difficulties tend to favor asset securitization and give three reasons for doing so. First, the number of ABS companies with low credit ratings is growing. Second, the emergence of credit default swap facility allows SPV's credit risk to be hedged. Third, the flexibility and liquidity of ABS make investors' investment portfolio more diversified. Compared with mortgage loans, the risk of ABS revenue is limited to the underlying assets. Moreover, the small denomination of ABS can reduce

the investment risk.

Asset securitization and bankruptcy risk. 陈裘逸等（2003）point out that "bankruptcy remoteness" is the main feature of the SPV, which is used to avoid the losses of investors, caused by the bankruptcy of the originator. The use of SPVs reduces the number of bankrupt assets, thus reducing the cost of bankruptcy. Therefore, the off-balance sheet financing function of asset securitization is the most favorable for companies with high risks or facing huge bankruptcy costs (Leland, 2007).

Asset securitization and credit market segmentation. Gordon (2000) and DeMarzo (2005) point out that the SPV can make originators and the underlying asset achieve “bankruptcy remoteness”. When investors know that their investment is isolated from the originator's potential bankruptcy risk, their bid for ABS will increase. As a result, a company that could not borrow at investment-grade rates was able to finance itself through securitization at that rate. Furthermore, layered structures of ABS help senior investors obtain more investment opportunities.

Asset securitization and accounting arbitrage. Dechow et al. (2009) and Lemmon et al. (2010) point out that many companies with high credit ratings choose to securitize their assets for accounting arbitrage purposes. Accounting standards on the sale of financial assets may encourage managers to actively choose the timing of securitization for the purpose of whitewashing accounting statements. 朱荃等(2019) contends that asset securitization can reduce the leverage of enterprises, but it needs to meet two preconditions. One is to realize the “true sale” of assets in the accounting sense, the other is to use ABS revenue to repay any stock liabilities.

5.2.2 Literature Review on Empirical Studies

In the empirical research of securitization, most scholars utilize commercial banks as the research sample and focus on the European and American financial markets. Few of studies focus on non-financial enterprises and the implications to China's financial reform. The main reason is that the time when asset securitization business first appears to the present is rather too short and the available data is yet insufficient, too. To present, there are mainly two research methods to study the motivation of non-financial enterprise's securitization. One is to review asset securitization as an independent variable, to study the impact of asset securitization on financial performance and stock return, the other is to review asset securitization as a dependent variable, to study the determinants of asset securitization. 杨波等(2018) uses the event study method and the Fama–French three-factor model to study the short-term wealth effect of asset securitization, taking 26 ABS products issued by 19 listed companies in China from 2014 to 2016 as samples. 杨波等 study found that asset securitization has a positive short-term wealth effect. The smaller the market values of the originator, the more obvious the wealth effect of asset securitization. Then we have 李丹等(2019) who used the factor analysis method to analyze the financial performance of asset securitization in 55 central state-owned enterprises. That study concluded that asset securitization improves the profitability and liquidity of enterprises, but has no significant impact on solvency and operating capacity. 肖东生等 (2016) studied the relationship between the decision of asset securitization and the company's financial characteristics, reviewing 33 listed companies in China from 2007 to 2014 as samples and using the Probit regression model. The conclusion of that study is that the smaller

the scale, the greater the liquid liabilities, decision makers are more inclined to carry out asset securitization. 张胜松等 (2018) studied the motivation of asset securitization, based on the logistic model and taking 120 enterprises from 2004 to 2017 as samples. The empirical results show that the motivations of asset securitization are not to reduce the financing cost, but expand the financing scale, supplement liquidity and improve debt paying ability. In the research of 杨波等 (2018) and 李丹等 (2019), asset securitization is regarded as an independent variable; thus their research methods are added here solely for model design purposes. There are three problems in the research of 肖东生等 (2016) and 张胜松等(2018). First, the sample data is small, so the reliability of the research conclusion is weak; Second, the research conclusion of "small-scale enterprises tend to asset securitization" of 肖东生等 (2016) is contrary to the mainstream foreign literature (Lemmon et al., 2014) (only large firms tend to asset securitization because of the hign cost of the securities and small firm with few underlying assets can’t reach scale economy), and it is questionable. Third, these documents do not mix well with the background of China's financial reform, and their conclusions are not of a strong policy significance.

5.2.3 Contributions of this Study

⑴ This research adds to the development factors of China's economic transformation and asset securitization market. The research period is from 2012 to 2017. During this period, the Chinese government implemented the "four trillion" (RMB)economic stimulus plan and supply-side structural reforms characterized by the rapid development of the asset securitization market. The implementation of these

policies has had a significant impact on corporate asset securitization decisions.

⑵Combining the characteristic factors of the ABS market at this stage. Under the conditions of the private equity market, the risk appetite of ABS qualified investors is unique, and its impact on ABS pricing, maturity, credit rating, liquidity and corporate governance will ultimately affect the company's asset securitization decision.

5.3 Research Methods

5.3.1 Model Design

$$\Pr(Initiation_{it} = 1) = \Phi(\beta X_{it} + b) \quad (1)$$

In formula (1), Φ (…) is a standard normal distribution *probit* function, the dependent variable *Pr* is a dummy variable, which represents the company's asset securitization decision, and *Xit* represents the influencing factors of enterprise asset securitization decision in *probit* regression.

5.3.2 Data Sources and Data Processing

In this research the author selected 3,444 non-financial companies listed in the A-share market from 2012 to 2017 as samples; data is from WIND and CSMAR database.

(1) Remove companies with serious data loss;

(2) All variables have been winsorized with 1% and 99% quantiles; and

(3) Fixed the impact of different years and different companies.

Initially, 3,530 listed companies were selected. Referring to the previous research

practice, there are significant differences in ABS business form between financial and non-financial companies. Therefore, this study eliminates financial listed companies and some delisted companies. Finally, 3,444 non-financial listed companies were selected for the study, and the observation results of each ABS company were counted once a year, forming an unbalanced panel data composed of 11,521 samples. In the whole sample, the explanatory variable with the value of 0 is the annual observation value of the non- issuing ABS companies from 2012 to 2017, and the value of 1 is the ABS issuing companies. Only considering the issue time point and not considering the duration of ABS is to avoid the autocorrelation effect in the dependent variables.

Table 5.1 Proxy Variables of Influencing Factors

Proxy Variables	Variable Name	Variable Description	Expected Symbol
Pr (dummy)	Securitization or not	A dummy variable. If company i issued securities in year t, the value is 1; otherwise, it is zero	Explained variable
lnA	Company size	The natural logarithm of the company's total assets	(+)
AR/A	Accounts receivable ratio	Accounts receivable / total assets	(+)
RD/A	R&D cost ratio	R&D expenses / total assets	(-)
D/A	Asset liability ratio	Total liabilities / total assets	(+)
(D/A)^2	Square of asset liability ratio	（Total liabilities / total assets）^2	（－）
EBITD/A	Return on assets	Income (before interest, tax, depreciation and amortization) / total assets	（？）
PPE/A	PPE ratio	Fixed assets / total assets	（？）
lnAge	Financial constraints	Natural logarithm of enterprise age	（？）
ΔS/S	Company growth rate	(Current sales - previous sales) / previous sales	（？）
ETR	Effective tax rate	Effective tax rate of corporate income tax	（？）
Volatility	Stock volatility	Annualized standard deviation of stock return	（？）
AA	AA credit rating	A dummy variable. If the company's credit rating is AA, the value is 1; otherwise, it is zero	（－）
AA+	AA+ credit rating	A dummy variable. If the company's credit rating is AA +, the value is 1; otherwise, it is zero	（＋）
AAA	AAA credit rating	A dummy variable. If the credit rating of the company is AAA, the value is 1; otherwise, it is zero	（＋）
ifnonstate	Non-state-owned enterprises	A dummy variable, if the ownership form of the company is a non-state-owned enterprise, the value is 1; otherwise, it is zero	（？）

5.3.3 Variable Selection

Taking the issuance of asset securitization as the explanatory variable, the proxy variable is *Pr* (dummy), which is a dummy variable. If company i issued asset-backed securities (ABS) in year t, the value is 1, otherwise it is 0; the influencing factors of enterprise's asset securitization decision are taken as explanatory variables, as shown in Table 5.1, the influencing factors of issuing securitization products may include company size and accounts receivable fund ratio, R&D expense ratio, asset liability ratio and enterprise credit ratings.

5.3.4 Descriptive Statistics

Table 5.2 shows the descriptive statistics of the explanatory variables used in subsequent regression.

The asset scale of securitization companies is about 15 times that of non-securitization companies. This means that ABS issued by large companies is more popular in the market.

There are more accounts receivable on the balance sheet of non-securitization companies. The ratio of accounts receivable is about 3.56 percentage points higher than that of ABS companies. More accounts receivable undoubtedly make these companies more willing to securitize assets.

In terms of asset liability ratio. The average value of securitized companies is 68.66%, and that of non-securitized companies is 42.74%. It shows that companies with a higher asset liability ratio have a stronger willingness to securitization.

What about the credit rating? There are many differences between ABS companies and non-ABS companies in terms of credit rating, mainly in AA + and AA, which indicates that companies with medium and above medium credit rating have higher willingness to have securitization.

Table 5.2 Descriptive Statistics

Variable	Securitized sample		Un-secutitized sample		Diff	
	Mean	Std Dev	Mean	Std Dev	T-statistic	Std Dev
Ln(A)	24.4615	1.3792	21.7546	1.4032	2.7069***	0.0963
AR/A	0.1303	0.1714	0.1659	0.1325	-0.0357***	0.0091
RD/A	0.0052	0.0087	0.0213	0.0246	-0.0161***	0.0017
D/A	0.6866	0.1231	0.4274	0.4142	0.2592***	0.0300
EBITD/A	0.0488	0.0272	0.0816	0.0878	-0.0327***	0.0060
PPE/A	0.1825	0.2194	0.2567	0.1849	-0.0742***	0.0127
AAA	0.1163	0.3213	0.0817	0.2740	0.0345*	0.0188
AA+	0.2326	0.4234	0.3664	0.4818	-0.1338***	0.0330
AA	0.1163	0.3213	0.1167	0.3211	-0.0005	0.0220
Unrated	0.5349	0.4999	0.4352	0.4958	0.0997***	0.03403

Notes: ***, **, and * indicate a significant difference between ABS firms and non-ABS firms at 1%, 5%, and 10% confidence levels,under t-test, respectively.
Source：WIND, CSMAR database

5.4 Empirical Analysis

5.4.1 The Probit Regression

As shown in Table 5.3, Probit regression divides the samples into three groups. Columns 1 to 3 are the first group, which is the full sample; columns 4 to 6 are the second group, which are large companies, and the sample does not include companies

with asset size less than US$6.208 billion[25]. Columns 7 to 9 are the third group of large ABS companies (the sample includes large ABS companies and non-securitized companies of the same size[26]). The sample excludes companies with asset size less than US$6.438 billion[27]. The regression of the second and third groups of samples can be regarded as the robustness test of the first group of regression. The dependent variables in the three groups of regression are all dummy variables *Pr (dummy)*, and the numbers in brackets under the regression coefficient are the robust standard errors of clustering within enterprises. In order to estimate the marginal effect, the number in square brackets is calculated as the influence of the change of one standard deviation of continuous explanatory variable on the explained variable, or the influence of changing the dummy explanatory variable from 0 to 1, while keeping other variables at their sample mean value.

5.4.2 Regression Results

Table 5.3 presents the Probit regression results, showing the regression estimation coefficient between the probability of an enterprise starting an asset securitization plan in a financial year and the company characteristics measured at the beginning of the year. The regression results show that the asset securitization probability of China's non-financial listed companies is positively correlated with the size of the company and the concentration of accounts receivable, negatively correlated with the R&D expenses, positively correlated with the asset liability ratio, negatively correlated with the square of the asset liability ratio, and negatively correlated with the dummy variable AA +. It

[25] 10% quantile of total assets of all sample companies
[26] The third group is a subset of the second group. The non-ABS samples in the third group refer to annual samples only. In fact, ABS companies do not issue ABS every year, and the ABS sample in this study only takes the first year of issuance.
[27] 10% quantile of ABS total assets

can be summarized as follows:

(1) Company size (+), Accounts receivable ratio (+), R&D cost ratio (-)

(2) Asset liability ratio (+), The square of asset liability ratio (-)

(3) *AA+* (*dummy*) (-)

Companies with large assets and concentrated accounts receivable tend to issue asset securitization. The results are consistent with the descriptive statistics in Table 5.2. The proportion of R&D expenses has a significant negative impact on ABS issuance intention. Enterprises with high R&D expenses have more investment opportunities and abundant cash flow, so they seldom issue ABS. On the contrary, the enterprises with relatively lean R&D expenses are short of investment opportunities and cash flow. In the absence of opportunities to enter the high-grade credit market, asset securitization has become the inevitable choice.

The estimated coefficient of the dummy variable *ifnonstate* is not significant in the three groups of samples, which indicates that there is no statistical causality between the ownership form of an enterprise and its asset securitization decision-making.

The asset liability ratio is used to measure the credit risk of an enterprise. The regression coefficient of *D/A* is significantly positive, which indicates that enterprises with high asset liability ratio tend to issue ABS. The off-balance sheet ABS[28]， can help firms realize off-balance sheet financing without increasing liabilities. The $(D/A)^2$ coefficient is negative, which indicates that there is a concave relationship between the asset liability ratio and the willingness of asset securitization. In other words, the

[28] The off-balance sheet ABS can be interpreted as the transfer of the underlying assets meets the accounting standards for the derecognition of financial assets, and can be removed from the sponsor's balance sheet.

probability of a company initiating securitization increases with the increase of asset liability ratio, but decreases with the increase of asset liability ratio after reaching the peak value of asset liability ratio distribution (about 0.068). This shows that there is an upper limit on the debt issued by the sponsors through ABS, and the reasons for this ceiling mainly include two aspects. One is the resistance of existing creditors to the issuance of new debt; the other is the restriction of enterprise asset liability ratio by market supervision departments.

Credit rating is used to measure the credit risk of companies. The regression results show that the use of asset securitization is mainly concentrated in AA + listed companies. The companies with higher rating AAA and lower rating AA and below have lower willingness to issue ABS. However, from AAA to AA +, the estimated marginal effect of ABS issuance probability increased by - 0.08% (- 0.07% vs. - 0.15%). This shows that although ABS companies focus more on AA + rating, with the lowering of the company's credit rating (from AAA to AA +), ABS's willingness to issue is reduced. This is contrary to the previous research conclusion, where American companies whose credit rating of ABS has been downgraded are more likely to use securitization because they have lost the opportunity to finance in the high credit rating market (Lemmon et al., 2014). This condition reflects that those investors in the China's ABS market have special risk preference and hold sensitive investment confidence. These "qualified investors" prefer to buy ABS securities issued by AA + or above rating companies, and look unfavorable on enterprises whose credit rating is lowered.

Table 5.3 Probit Regression of Influencing Factors of Asset Securitization

Explanatory variables	Full sample			Large companies			Large ABS company		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ln(A)	0.632***	0.657***	0.658***	0.632***	0.656***	0.658***	0.609***	0.636***	0.656***
	(0.126)	(0.129)	(0.128)	(0.126)	(0.129)	(0.128)	(0.159)	(0.161)	(0.165)
	[0.13%]	[0.14%]	[0.15%]	[0.13%]	[0.14%]	[0.15%]	[0.62%]	[0.69%]	[0.76%]
AR/A	1.783*	1.833**	2.078**	1.782*	1.831**	2.077**	1.579	1.669	1.909*
	(0.917)	(0.914)	(0.933)	(0.917)	(0.914)	(0.933)	(1.112)	(1.108)	(1.151)
	[0.36%]	[0.38%]	[0.46%]	[0.38%]	[0.4%]	[0.49%]	[1.61%]	[1.82%]	[2.21%]
RD/A	-37.52**	-38.11***	-41.66***	-37.51**	-38.10***	-41.65***	-32.13*	-31.85**	-37.00**
	(14.69)	(14.63)	(15.19)	(14.69)	(14.63)	(15.19)	(16.43)	(16.12)	(17.31)
	[-7.49%]	[-7.85%]	[-9.24%]	[-7.91%]	[-8.29%]	[-9.76%]	[-32.75%]	[-34.63%]	[-42.83%]
D/A	0.136**	0.137**	0.143**	0.136**	0.137**	0.143**	0.171*	0.179*	0.183*
	(0.0682)	(0.0686)	(0.0694)	(0.0683)	(0.0686)	(0.0694)	(0.0969)	(0.0998)	(0.100)
	[0.03%]	[0.03%]	[0.03%]	[0.03%]	[0.03%]	[0.03%]	[0.17%]	[0.19%]	[0.21%]
(D/A)2	-0.000996*	-0.00101*	-0.00106**	-0.000995*	-0.00101*	-0.00105**	-0.00125*	-0.00131*	-0.00134*
	(0.000527)	(0.000531)	(0.000535)	(0.000527)	(0.000531)	(0.000535)	(0.000723)	(0.000744)	(0.000748)
	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]
EBITD/A	-3.586	-3.655	-3.310	-3.593	-3.662	-3.315	-6.662	-6.861*	-6.422
	(3.289)	(3.255)	(3.322)	(3.290)	(3.256)	(3.323)	(4.096)	(4.038)	(4.241)
	[-0.72%]	[-0.75%]	[-0.73%]	[-0.76%]	[-0.8%]	[-0.78%]	[-6.79%]	[-7.46%]	[-7.43%]
PPE/A	-0.669	-0.455	-0.414	-0.669	-0.455	-0.413	-0.683	-0.347	-0.372
	(0.558)	(0.569)	(0.556)	(0.558)	(0.569)	(0.556)	(0.625)	(0.635)	(0.631)
	[-0.13%]	[-0.09%]	[-0.09%]	[-0.14%]	[-0.1%]	[-0.1%]	[-0.7%]	[-0.38%]	[-0.43%]
Ln(Age)	0.0684	0.0614	-0.0226	0.0680	0.0610	-0.0228	0.174	0.134	-0.0140
	(0.380)	(0.377)	(0.385)	(0.380)	(0.377)	(0.385)	(0.430)	(0.426)	(0.441)
	[0.01%]	[0.01%]	[-0.01%]	[0.01%]	[0.01%]	[-0.01%]	[0.18%]	[0.15%]	[-0.02%]
ΔS/S	0.000830	0.000303	0.00101	0.000837	0.000309	0.00102	0.000288	-0.000472	0.000316
	(0.00249)	(0.00251)	(0.00250)	(0.00249)	(0.00251)	(0.00251)	(0.00301)	(0.00301)	(0.00311)
	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]	[0%]
ETR	0.565	0.625	0.545	0.564	0.625	0.544	0.458	0.552	0.428
	(0.599)	(0.603)	(0.602)	(0.599)	(0.603)	(0.602)	(0.672)	(0.680)	(0.681)
	[0.11%]	[0.13%]	[0.12%]	[0.12%]	[0.14%]	[0.13%]	[0.47%]	[0.6%]	[0.5%]
volatility	-0.0439	-0.0459	-0.0396	-0.0439	-0.0459	-0.0396	-0.0199	-0.0233	-0.0111
	(0.0449)	(0.0447)	(0.0441)	(0.0449)	(0.0447)	(0.0441)	(0.0469)	(0.0468)	(0.0457)
	[-0.01%]	[-0.01%]	[-0.01%]	[-0.01%]	[-0.01%]	[-0.01%]	[-0.02%]	[-0.03%]	[-0.01%]
AA			0.0227			0.0225			-0.0147
			(0.359)			(0.359)			(0.435)
			[0.01%]			[0.01%]			[-0.02%]
AA+			-0.694**			-0.694**			-0.849**
			(0.294)			(0.294)			(0.351)
			[-0.15%]			[-0.16%]			[-0.98%]
AAA			-0.337			-0.337			-0.601
			(0.345)			(0.345)			(0.406)
			[-0.07%]			[-0.08%]			[-0.7%]

ifnonstate		0.348			0.348			0.523*	
		(0.242)			(0.242)			(0.279)	
		[0.07%]			[0.08%]			[0.57%]	
Constant	-22.23***	-23.03***	-22.61***	-22.21***	-23.01***	-22.59***	-23.09***	-24.14***	-23.83***
	(4.366)	(4.475)	(4.409)	(4.369)	(4.477)	(4.411)	(5.814)	(5.956)	(5.958)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,521	11,521	11,521	10,903	10,903	10,903	2,118	2,118	2,118
Number of id	3,374	3,374	3,374	3,045	3,045	3,045	685	685	685

5.5 Conclusion

The results of regression analysis answers the three questions raised in the first part of the research (section 5.1).

(1) Under the Background of Supply-Side Reform, the Correlation between ABS Decision and the Originators' Financial Characteristics is still Very Strong

The results of the above table 5.3 show that enterprises with large assets and concentrated accounts receivable tend to issue ABS. This shows that the fixed cost of asset securitization is higher and there is scale economy. The asset securitization market does not welcome small-scale enterprises (in this research, the asset size should not be less than 620 million RMB). This conclusion is consistent with Lemmon et al. (2014) and Minton et al. (1997), but there are differences in magnitude. According to the research results of Lemmon et al. (2014), the asset scale of asset securitization enterprises is 10 times the average level of the same industry, and the concentration of accounts receivable is about 5% In this study, these two indicators are small, 1.14 times and 1.84%, respectively (Table 5.2). This can be explained. Compared with the United States, the development of China's asset securitization market is still in its infancy, and

the product quantity and issuance scale of ABS are relatively small. Therefore, the ABS company's asset size and accounts receivable concentration of the entire listed companies account for a relatively small proportion.

There is a concavity between the issuing probability of ABS and the asset liability ratio. The regression results in the research are similar to Lemmon et al. (2014), but the concavity is much smaller. In this study, the peak value of the asset liability ratio distribution is 0.068, and the marginal coefficient of the square term of the asset liability ratio is 0. However, in the research of Lemmon et al. (2014), the peak value of asset liability ratio distribution is 0.5, and the marginal coefficient of square term of asset liability ratio is -0.02%. The use of ABS may increase the originator's debt, so it will be resisted by the original creditors. Therefore, this concavity can be attributed to the original creditor's restrictions on ABS debt issuance, with the purpose of protecting their own rights and interests and avoiding the "expropriation risk" of new creditors and shareholders. In the United States, common terms in loan agreements will prevent companies from starting securitization programs (Lemmon et al., 2014). China's corporate governance system also has similar restrictions, that is, before issuing ABS, the company needs to obtain the consent of the original creditors and sign corresponding agreements. However, information asymmetry reduces the effectiveness of the management to implement the agreement, which makes the management have the opportunity to damage the original creditors in their self-interest including their shareholders, for example, the originators' implicit guarantee, over investment and so on. At present, in China, the relationship between ABS issuance probability and asset liability ratio may also be affected by other factors, such as the weak mechanisms for the original creditors to protect their own rights and interests (it is difficult for the

securities holders' meeting to play a role, and the number of credit risk hedging instruments is small). Therefore, compared with the results of Lemmon et al. (2014), the concavity is relatively small.

There is a significant negative correlation between R&D cost ratio and the issuance probability of ABS. The higher the proportion of R&D expenses, the lower the willingness to issue asset securitization, which is slightly different from the research results of Lemmon et al. (2014). Although the latter coefficient is also negative, it is not significant. The explanation is that most enterprises with a high R&D investment budget have sufficient cash flow, and there is no financing constraint in the main credit financing channels. Therefore, the willingness to finance through asset securitization is not strong. Compared with American enterprises, Chinese enterprises are more dependent on credit financing channels, and enterprises whose R&D expenses can better reflect financing constraints are significantly related to asset securitization.

There is no significant relationship between securitization intention and sales growth rate *(ΔS/S)*, profitability *(EBITD/A)* and fixed asset investment *(PPE/A)*. This shows that securitization is not used by companies with growth opportunities. There are two explanations for this phenomenon. First of all, the securitization enterprises usually face financial difficulties. The funds from securitization are usually used to repay the debt, rather than to expand investment. Second, high growth companies are usually favored by private equity funds for financing, and thus do not have to choose ABS financing, because this will only increase financial leverage and is not conducive to an on-balance sheet debt (Lemmon et al., 2014).

(2) The Decision of ABS Has Nothing to Do with the Ownership of Originators

In the regression results, the coefficient of *ifnonstate* is not significant, which indicates that there is no statistical correlation between the ownership form of enterprises and the issuing tendency of ABS. The explanation is as follows: ownership can affect the credit rating of enterprises, and enterprises with government credit endorsement have low default risk and thus face less financing constraints. From this point of view, it seems that state-owned enterprises have lower willingness to issue ABS, while non-state-owned enterprises have higher willingness to issue ABS. However, ownership does not determine the financial characteristics of an enterprise, such as asset size, asset liability ratio and R&D investment. Therefore, the final result is that there is no correlation between ownership and ABS tendency of enterprises.

(3) Medium and Above Credit Rating Enterprises Tend to Securitization

This is consistent with previous studies, but there are also some differences. Table 5.3 shows that ABS issuance probability is mainly concentrated in AA and AA^{+} (upper medium credit rating) companies, while in Lemmon et al. (2014), ABS issuance probability is mainly concentrated in BBB and BB (lower middle credit rating) firms. The explanation for this condition is that there are two institutional barriers in China's ABS market at the stage of private placement. First of all, the qualification of ABS investors is restricted. Investment in ABS products must be recognized as "qualified investors" by the market regulatory authorities. At present, most of the "qualified investors" in ABS market are banking institutions with limited quantity, low risk preference, and insufficient dispersion and difference; Secondly, the information disclosure of ABS products is limited. As it is a private placement product, the relevant information of ABS products is only disclosed to the interested parties, and is not

sufficient. When market investors cannot note the default risk of underlying assets, they will only rely on the principal credit of the original equity holders. According to relevant policies, when commercial banks invest in asset securitization products, they can only invest in enterprises with AA^+ or above.

5.6 Suggestions

(1) The Legal Level of SPV Needs to be Improved

At present, the legal basis of asset securitization business in China is only the department rules (No. 49, 2014 of China Securities Regulatory Commission)[29], which cannot resist the bankruptcy law on the legal effect of bankruptcy isolation. Although up to now, there has been no bankruptcy liquidation of ABS company in the market. However, once the originator goes into bankruptcy liquidation, according to the bankruptcy law, the underlying assets sold to SPV will be seized by the court and listed as "bankruptcy remoteness". At that time, the "bankruptcy remoteness" effect of Special Purpose Vehicle (SPV) will no longer exist, and the assets of ABS investors will face the risk of being frozen.

(2) The Information Disclosure of Underlying Assets Needs to be Improved

At present, the reason why ABS investors rely so much on originator credit rating and ignore ABS product rating is that they cannot clearly understand the cash flow of underlying assets, such as default rate, overdue rate, early repayment rate, volatility, and customer concentration (Liu et al., 2017). Over reliance on the credit rating of originators has caused serious distortions in market pricing. The vast majority of

[29] http://www.csrc.gov.cn/pub/zjhpublic/G00306201/201411/t20141121_263851.htm

non-state-owned enterprises are excluded from the ABS market because their main ratings are mostly lower than AA^{+}. However, the state-owned enterprises that issue ABS are faced with serious risk of rigid cashing due to their involvement in the overall credit. The consequence of this reality is that ABS may eventually evolve into another form of corporate bond. If ABS market develops further along this direction, it will increase the credit crisis of the Chinese government and the systemic risk to the financial market.

(3) ABS Market Begins to Enter Default Period, so Cash Flow Forecast of Underlying Assets should be Cautious

ABS is a kind of complex structured financial product. For each single product, there are more than 10 counterparties. Any one of the counterparties default is equal to an ABS default. The risks faced by investors mainly comes from the sponsors. If the sponsor sells the unqualified underlying assets, ABS may default. For example, for the DaCheng Xi Yellow River Highway Bridge, the originator overestimated the cash flow (vehicle tolls) of the underlying assets, resulting in the breach of contract on the first payment. In another case, the ABS of KaiDi Electric power charging right, whether the underlying assets of the future creditor's rights (charging right for electricity fees) are “true sale” or not, the existing creditors of the originators and the administrator of the special purpose entity filed legal proceedings to Intermediate People's Court of Hefei Municipality, Anhui.

(4) China's Accounting Standards for Business Enterprises (No.23, Transfer of Financial Assets) should Issue a Unified Implementation Standard

Although China’s accounting standard establishes the principal framework for

judgment of the underlying assets in asset securitization business, due to the principle and conceptualization of the provisions of the standard, different certified public accountants give opposite conclusions on the accounting statement in the same ABS business. The transfer of financial assets that do not meet the requirements of accounting standards will transfer the risks of the originators that are not fully disclosed. The essence is not “true sale”, but mortgage financing. This is an infringement on the interests of ABS investors and will eventually damage China's financial market.

(5) The Accuracy of ABS Market Credit Rating Results Should be Improved

Although China's credit rating technology and methods have greatly improved after decades of development, the rating results are still affected by the government's implicit guarantee, and the difference is less. Even without the implicit guarantee from the government, issuers have the motivation to purchase ratings (He et al., 2012). Only when the rating results fully reflect the default risk of sponsors and bonds, can ABS market develop healthily and permanently along the road of marketization.

5.7 Limitations of the Study

The empirical research in this chapter does not involve heterogeneity and endogeneity, and the results of the study have certain limitations.

6 CHINESE STANDARDS FOR "TRUE SALE"—A CASE STUDY OF KAIDI POWER CHARGING RIGHT ABS

6.1 Introduction

The Chinese regulation of "true sale" comes from the China Banking Regulatory Commission (CSRC), "The Administrative Regulations No.49" (CSRC, 2014). The Regulations clearly define the independence of the underlying assets of securitization, and also define the "bankruptcy remoteness" between originators and Special Purpose Vehicle (SPV). However, so for, the regulations have been only promulgated by the CSRC. It is belong to the department rules and are located at the third level of the legislative level in China. Once it is inconsistent with laws and other administrative regulations. Its effectiveness is limited.

6.2 Overview of the Case

In June 2015, KaiDi Ecological And Environmental Technology Co., Ltd (KaiDi Ecology) (000939.*ST KaiDi), with its three wholly-owned subsidiaries (Long Hui KaiDi, Nan Ling KaiDi and Song Zi KaiDi) as originators, issued an asset-backed securities (ABS) based on the right to charge electricity for biomass power plants. Table 6.1 presents the details of the ABS product.

Table 6.1 Details of the ABS Product

Name of the ABS project	Ping An KaiDi power charging right Assets Securitization
Maturity of the product	5 years, from June 2015 to June 2020
Issue scale	1.1 billion RMB
Underlying assets	Charging right for electricity incomes
Originator & Assets service provider	3 subsidiary companies of KaiDi Ecological And Environmental Technology Co., Ltd (KaiDi Ecology) (000939.*ST KaiDi) (1) LongHui KaiDi; (2) NanLing KaiDi; (3) SongZi KaiDi

Transaction documents related to the issuance of the ABS are:

Documents (1): Underlying Assets Trading

Documents (2): Standard Terms of the Program

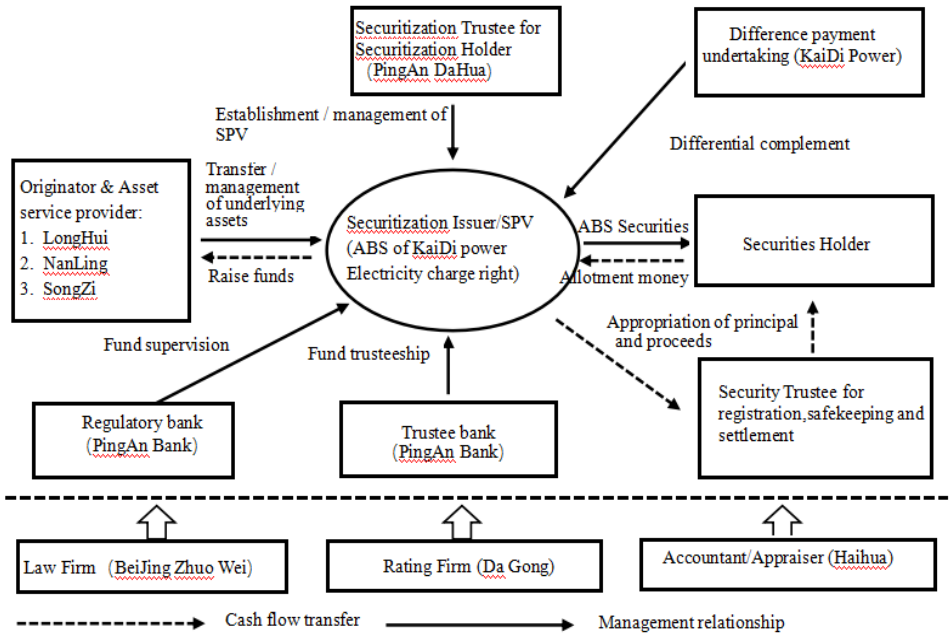
Documents (3): Specifications of the Program

The product composition of KaiDi power charging right ABS is presented in Table 6.2.

Table 6.2 The Product Composition of KaiDi Power Charging Right ABS

Class of Securities	Amount of issue (ten thousand RBM)	Interest Rate	Int Payment	Repayment of Principal	Expected Deadline	Stratified Ratio	Rating (original)	Rating 11/5/2018
Security Group 1	20,000	5.5%	Semi-annually	Maturing debt	1	18%	AA+	AA+
Security Group 2	20,000	6.0%	Semi-annually	Maturing debt	2	18%	AA+	AA+
Security Group 3	20,000	6.5%	Semi-annually	Maturing debt	3	18%	AA+	AA+
Security Group 4	20,000	8.0%	Semi-annually	Maturing debt	4	18%	AA+	BBB-
Security Group 5	20,000	8.5%	Semi-annually	Maturing debt	5.01	18%	AA+	BBB-
Residual RR	10,000	-	-	Pass-through	5.01	9%	NR	NR

Figure 6.1 The Transaction Structure of KaiDi Power Charging Right ABS



6.2.1 Event Description

Who are the Parties concerned?

Company A: DaHua company, manager of SPV, representing the interests of ABS investors;

Company B: NanLing KaiDi, a subsidiary company of KaiDi Ecology company;

Bank C: HeFei DaXing Rural Commercial Bank, Creditor of Company B; and

Company D: National Power Grid Corp (AnHui), charging electricity to users and transfer electricity fees to KaiDi Ecology.

Figure 6.2 Diagram of KaiDi Event Relationship

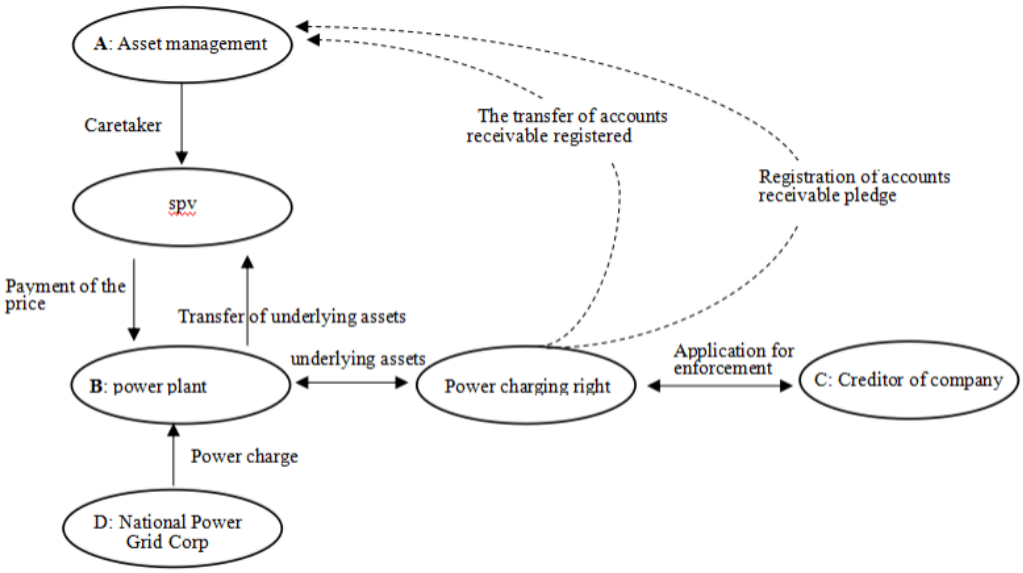


Diagram of KaiDi event relationship

In 2018, Company B was forced to apply for enforcement by Bank C because of their debt dispute. The Executive Court served a notice of assistance to Company D requesting it to stop paying Company B's electricity and subsidies of 30 million RMB for the term May 18, 2018 to May 17, 2021. Company A disagrees with the enforcement court's objection to the freezing of Company B's 30 million RMB receivables. The reason is that the account receivable are the underlying assets of ABS and have been transferred to SPV according to the agreement of the transaction documents and no longer belong to Company B. Figure 6.2. above shows the diagram of the KaiDi event relationship.

6.2.2 Arguments from All Parties

Company A： The electricity and subsidy payment should be 30 million RMB,

which is owned by Company A.

Bank C: First, Company A only transferred part of the 1.1 billion RMB raised fund to Company B. The property involved does not belong to “KaiDi Ecology ABS”, according to Document (1); and requested the court to reject company A’s objection application. Second, the underlying assets only include electricity charges, and not government subsidies, according to Document (1). Last, Document (1) stipulates that the ownership of the electricity fee shall not be vested in SPV until the supervisory bank has transferred the cash flow into the SPV account.

So, what position did the Intermediate People's Court of Hefei Municipality, Anhui (HEFEI) take. First of all, the three contracts, Documents (1), (2), (3) are a whole. Underlying assets are all cash income related to creditor’s rights, including electricity charges, renewable energy subsidies, peak shaving and downtime compensation. Secondly, according to Document (3), the originators are composed of three subsidiaries of KaiDi Ecology. Because the entire sum of the 1.1 billion RMB raised funds are transferred into the three subsidiaries, the ABS program takes effect. Finally, Company A and Company B have registered the assignment of accounts receivable, and the relationship between Company A and Company B is the assignment of creditor's rights.

6.2.3 Court Decision

HEFEI determined that Company A obtains all cash income as creditor’s rights of the three companies, including Company B, from May 2015 to June 2020, in consideration of the payment of 1.1 billion RMB, arising from the electricity charges, renewable energy subsidies, peak shaving and downtime compensation that the biomass power generation company of Anhui Province has the right to obtain from the national

grid.

6.3 Analysis and Discussion

(1) Is the Definition of Underlying Assets Complete?

The scope of the underlying assets transferred by the originators is not fully defined, thus forming a controversy. In the “Underlying Assets Trading” signed by SPV Manager PingAn DaHua Company and its originator NanLing KaiDi Company, the assets transferred are “electricity fee income”, which does not clearly indicate whether the so-called “electricity fee income” includes various policy subsidies. But the “Specifications of the Program” defines the “electricity income”, including all kinds of subsidy costs. The definition of the key concept of “underlying assets” does not match perfectly well among several legal documents under the framework of the same project, thus causing controversy among the parties involved.

(2) Are the Transfer of Underlying Assets Effective?

PingAn DaHua Company’s underlying assets acquisition process is not fully in line with the relevant contract provisions. In accordance with the “Underlying Assets Trading”, PingAn DaHua Company shall transfer all capital for acquiring the underlying assets to the relevant account of NanLing KaiDi Company as stipulated in the contract. Nevertheless, PingAn DaHua transferred part of the funds to another originator’s account (LongHui KaiDi). This directly leads to the question of the effectiveness of the acquisition of its underlying assets.

(3) Are the Underlying Assets Actually Sold?

In this case, the originators of NanLing KaiDi Company and SPV of PingAn DaHua Company handled both the “Registration of Accounts Receivable Transfer” and

the “Registration of Accounts Receivable Pledge”. The transaction sells underlying assets while setting up a mechanism for recourse to the assets of the originators. The fact that the transfer and redemption coexist leads to the question of the trust relationship between the originator and the SPV.

There are two distinct situations that could cause courts to consolidate the SPV’s assets into the bankruptcy estate of the originator, thereby thwarting an originator’s attempt at “bankruptcy remoteness”. These risks here are termed the separate entity risk and the characterization risk. If a securitization falls to be victim to either of these risks, the SPV (and its investors/creditors) must compete with all of the originator’s creditors during the bankruptcy proceeding for the originator’s remaining assets.

Separate entity risk is if a bankruptcy court determines that the SPV is not a substantially separate legal entity from the originator, it may consolidate the SPV's assets with the originators in the originator’s bankruptcy estate. These factors, such as compliance with corporate formalities, non-commingling of assets, and separate financial reporting, describe an SPV that has the necessary detachment to be able legitimately to engage in an arms’ length transfer of assets with the originator. By following these guidelines, the SPV can serve as a successful vehicle to segregate securitized assets.

Characterization risk is the risk that a bankruptcy court will view the originator’s conveyance of assets to the SPV as a secured cash flow rather than as a “true sale”. Under this analysis, a court could hold that the SPV has not “purchased” the originator’s assets, but rather has loaned money to the originator, secured by the securitized assets. (Thomas J. Gordon, 2000)

(4) Can “True Sale” Argue Against “Bankruptcy Remoteness”?

Suppose NanLing KaiDi Company (as the originator) filed for bankruptcy and liquidation, what would happen?

According to “The Administrative Regulations No.49”, CSRC, the relationship between the SPV and the originator is similar to assets trading, that is to say, it only applies to the trading relationship stipulated in the Contract Law of the People’s Republic of China.

Although it is stipulated in “The Administrative Regulations No.49”, CSRC that “the assets of an ABS are inherent property independent of the originators, SPV managers, trustees and other participants”, the Regulations are promulgated by CSRC and are under departmental regulations. The legislative effect of the Regulations is not as good as that of the Law, namely, the “Bankruptcy Law” of the People’s Republic of China.

Once the court and the insolvency administrator liquidate the originator in accordance with the “Bankruptcy Law”, can SPV defend its purchase of assets independent of the originator’s other property? Can the liquidation administrator and other creditors recognize that the cash income generated by the underlying assets does not belong to the bankruptcy property? Or should it still be carried out in accordance with the bankruptcy law?

Article 30 of the Bankruptcy Law stipulates that “all the property belonging to the debtor at the time of acceptance of the bankruptcy application and the property acquired by the debtor from the time of acceptance of the bankruptcy application to the end of the bankruptcy proceedings shall be the debtor's property”.

According to the facts disclosed in the ruling of this case, PingAn DaHua notified AnHui Electric Power Company of the State Grid of China to transfer the electricity

revenue corresponding to the underlying assets transferred by NanLing KaiDi Company directly into the SPV (originally replaced by NanLing KaiDi Company) because of the downgrade of KaiDi Ecology Company's credit rating, triggering the right improvement event and accordingly collected and assigned it to a project account. Therefore, even if NanLing KaiDi Company enters bankruptcy and liquidation, the funds already transferred to the special account will not be confused with other funds of NanLing KaiDi Company and will not be regarded as the bankruptcy property of NanLing KaiDi Company.

Nevertheless, if there is no right improvement event to change the way of the transfer, during the period when NanLing KaiDi Company acts as an assets service agency to collect the underlying assets including recovery money, if the court accepts the bankruptcy application of NanLing KaiDi Company, and the self-owned capital of NanLing KaiDi Company and the recovery money it collects on its behalf has been mixed together, if it is impossible to identify, the recovered money collected by NanLing KaiDi Company may be regarded as the bankruptcy property by the court.

Article 16 of the Bankruptcy Law stipulates that “after the court accepts the bankruptcy application, the debtor's payment of the debts of individual creditors shall be void”.

If NanLing KaiDi Company is liquidated in bankruptcy during the period of SPV’s existence, the transfer of receivables against SPV from the date of acceptance of the bankruptcy liquidation of NanLing KaiDi will be deemed invalid, and SPV will face the risk of being required by the bankruptcy administrator to return the proceeds.

Article 18 of the Bankruptcy Law stipulates that after the court accepts the bankruptcy application, the bankruptcy administrator has the right to terminate or

continue to perform the contract established before the bankruptcy application is accepted and neither the debtor nor the other party has fulfilled the contract, and has notified the contrary party. If the bankruptcy administrator fails to notify the other party within 60 days from the date of acceptance of the bankruptcy application, or fails to reply within 30 days from the date of receipt of the other party's reminder, the contract shall be deemed to have been terminated.

During the period of SPV's existence, if NanLing KaiDi Company is liquidated into bankruptcy, it may face the risk of being terminated by the bankruptcy administrator if it has signed but has not yet fulfilled the "Underlying Assets Trading". Once the contract is no longer implemented, the proceeds of the underlying assets purchased by SPV cannot be transferred to SPV, thus causing losses to investors. Although, Article 53 of the Bankruptcy Law stipulates that if the bankruptcy administrator or the debtor rescinds the contract in accordance with this Law, the other party shall declare his claim for damages arising from the rescission of the contract. However, as a creditor of an unsecured ordinary creditor's right, SPV can only distribute bankruptcy property according to the ratio of creditor's rights to other creditors, which is far from satisfying the demand of principal and interest payment of assets securities, and thus the "bankruptcy remoteness" purpose of assets securitization cannot be realized.

Article 31 of the Bankruptcy Law stipulates that "within one year before the court accepts the bankruptcy application, the bankruptcy administrator has the right to request the court to revoke the following acts involving the debtor's property", one of which is "to conduct transactions at apparently unreasonable prices".

Discount sale is a common transaction arrangement in assets securitization projects,

especially in accounts receivable and executor future claims assets securitization. Discount sale refers to the scale of the underlying assets transferred by the originators over the size of the securities issue. To avoid being identified as trading at apparently unreasonable prices, a reasonable discount rate is required.

In addition, most assets securitization products will adopt an excess coverage (or excess mortgage) of the internal credit enhancement measures, in the setting of excess coverage multiples are basically to issue the size of the securities principal plus the current period interest (at present, the excess coverage is usually between 1.1~1.3 times). Although this excess coverage also causes the originator to transfer more underlying assets than the size of the securities issue, but because the originator has the "seller's rights" to the excess part, in the absence of guaranteed performance, the excess part of the proceeds will be "released" to the originator. Therefore, excess coverage or excess mortgage is different from discount sales, and cannot be identified as "trading at apparently unreasonable prices". However, this view must be accepted by the bankruptcy administrator and the court, otherwise it is a potential disaster for assets securitization business.

(5) The Matter of Originators Serving as Assets Service Providers

At present, most of the asset securitization projects are held by the sponsors as assets service providers, that is to say, the sponsors will continue to manage the underlying assets as assets service providers after transferring the underlying assets to SPV, performing the collection, transfer of underlying assets cash flow and other related business. In this case, three originators have also acted as assets service providers. As an assets service provider, the originators can easily lead to confusion between his own funds and funds collected. If the frequency of payment is too low, the recovery time is

likely too long on the originator's account, thus there would be a significant delay in payment, and the originator may not be considered to have given up control of the underlying assets in such case.

6.4 Financial Analysis of the Originators

6.4.1 Background of the Case

The originators of this case of LongHui KaiDi, NanLing KaiDi and SongZi KaiDi are three wholly-owned subsidiaries of KaiDi Ecology (000939.*ST KaiDi).

Table 6.3 Ownership Relationship between Parent Company and Three Subsidiaries

Order Number	Subsidiary	KaiDi Ecology Holdings (10,000 shares)	Share of Subsidiaries （%）
1	LongHui KaiDi	8,100	100
2	SongZi KaiDi	8,100	100
3	NanLing KaiDi	8,100	100

Table 6.4 Ranking for Agricultural and Forestry Biomass Power Generation Firms（Top 4 by the end of 2017）

Serial Number	Companies	Installed Capacity (10,000 kilowatts)	Installed Capacity Ranking
1	KaiDi Ecological Environment Polytron Technologies Inc.	130.2	1
2	National Energy Power Generation Group Co., Ltd.	87.1	2
3	ShanDong QiQuan Group	24	3
4	China Everbright Green Environmental Protection Co., Ltd.	23	4

The main business of KaiDi Ecology is agriculture, forestry and biomass power

generation. According to the "China Biomass Power Generation Industry Ranking Report 2018" (China Association for the Promotion of Industrial Development Biomass Industry Branch, 2018), by the end of 2017, China had put into operation 270 agricultural and forestry biomass power plants, consuming about 54 million tons of agricultural and forestry wastes annually. While reducing environmental pollution, it had led to the employment of a rural labor force. The annual fuel purchase payments paid to farmers amounted to about 15 billion RMB, helping about 200,000 households lift themselves out of poverty.

6.4.2 The Financial Situation

⑴ The Three Originators Company

As can be seen from Table 6.5, the combined assets-liability ratios of the three originators in 2012-2014 were 70%, 72%, 67%, respectively, being highly financially leveraged. The ratio of current liabilities to total liabilities rose from 18% to 52%. It is inferred that the three originators are under short-term pressure to pay their debts. The purpose of issuing ABS is to solve the liquidity problem.

Table 6.5 Analysis of Three Originators' Solvency in 2012-2014 (100 million RMB)

Item	2012	2013	2014
Total Assets	0.81	0.94	0.99
Total Current Liabilities	1.05	2.67	3.47
Total Liabilities	5.70	6.84	6.66
Ratio of current liabilities to total liabilities	18%	39%	52%
Assets - liability ratio	70%	72%	67%

According to the issuance document (3), PingAn KaiDi ABS forecasts its cash

flow of electricity fee income, at an average of 470 million RMB between 2015 - 2020. But the fact is that the actual receipts in 2016 and 2017 were 262 million RMB and 323 million RMB, respectively, 44% and 31% less than the forecast average. The reduction of cash flow is due to the shortage of fuel caused by floods, resulting in a low operation ratio of the generating units. As a result of this low operation, the ABS product was presumably terminated early.

⑵ KaiDi Ecology

According to the information disclosed in the annual report, there is a mutual guarantee between the parent company KaiDi Ecology and the three subsidiaries (also the originators in this case). At the same time, KaiDi Ecology also acts as the guarantee of ABS of KaiDi Power Charging Right. If KaiDi Ecology defaults on its debt, it will directly affect the originator of this case, resulting in payment difficulties for the originator.

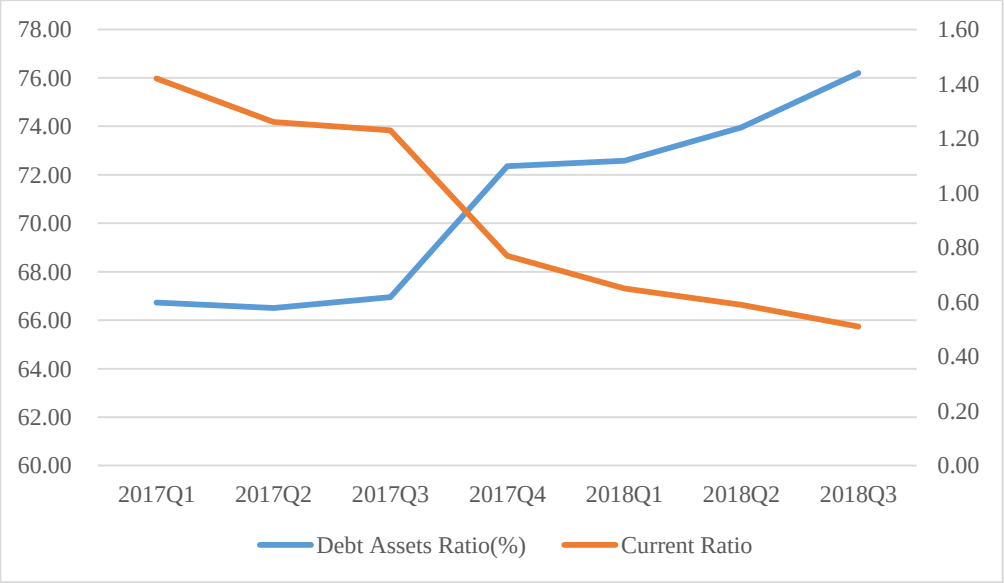
The total income of three subsidiaries is nearly 10% of the total revenue of the parent company. According to the 2016 report, NanLing KaiDi, LongHui KaiDi and Songz KaiDi all provided guarantees for KaiDi Ecology, amounting to 50 million, 449 million and 289 million RMB, respectively. The guarantee period is not equal, and the longer guarantee period involves 7 years. The inadequacy of operating capital, led to a decline in solvency of the parent company KaiDi Ecology. If the debt is not repaid, the creditor will ask the guarantor to compensate the debt (i.e., LongHui, NanLing, and SongZi). Therefore, if the financial situation of KaiDi Ecology deteriorates further, it will also reflect upon the financial situation of the three subsidiaries.

In May 7, 2018, KaiDi Ecology credit rating was downgraded from AA to C. It remains the same during the next 3-years.

1. Solvency Analysis

As shown in the Figure 6.3, from the first quarter of 2007 to the present, the current ratio has declined, from 1.42 to 0.51, a decrease of 64.08%. Current assets have already failed to make up for current liabilities, and there are insufficient funds for short-term operations. Examining the assets - liability ratio, from the first quarter of 2017 to the third quarter of 2018, the assets-liability ratio continued to rise, reaching 76.2%, an increase of 14.19%. This shows that the overall leverage level of enterprises is relatively high, and there is a high risk of debt repayment, and thus a significant possibility of default.

Figure 6.3 Solvency -Assets Liability and Liquidity Ratios of KaiDi Ecology



2. Profitability Analysis

As shown in Figure 6.4, the profitability of KaiDi Ecology is decreasing. Both earnings per share and net profit margin of sales showed a downward trend, with earnings per share falling from -16.67 to -1,080.67, a drop of 6,383%. Sales net profit

ratio also dropped from 13.71 to -107.49. This may be related to the continued weakening of the international and domestic economy and the oversupply in the energy industry sector.

Figure 6.4 Profitability-Earnings Per Share and Sales Net Profit Ratio of KaiDi Ecology

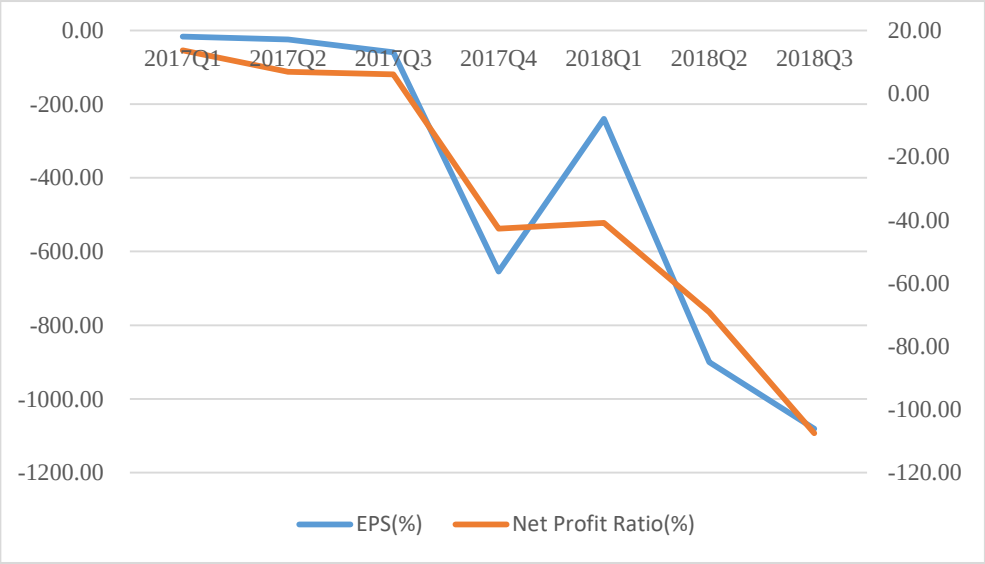
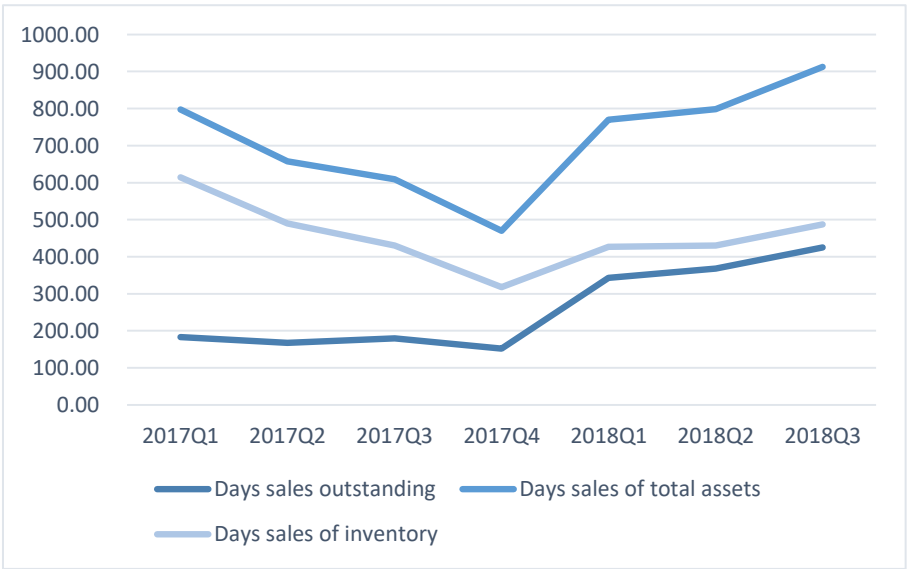


Figure 6.5 Operational Capability - Total Assets Turnover, Inventory Turnover and Accounts Receivable Turnover Days



The abnormal increase in earnings per share in the first quarter of 2018 may be due to the implementation of new accounting standards, the adjustment of government subsidies and the return of the “Value Added Tax”.

3. Operational Capability Analysis

As shown in the Figure 6.5, the total assets turnover days have always been maintained at a high level, but more so between 2017 and 2018, an increase from 797.18 days to 912.49 days. The accounts receivable turnover days increased from 183.26 days to 425.13 days. This may be related to the continued weakening of the international and domestic economy in China and the oversupply in the energy industry sector. In addition, the early expansion of KaiDi Ecology also caused a tight cash flow and poor operating conditions. Higher assets turnover days mean higher capital time cost and higher liquidity shortage. A pure disaster for KaiDi Ecology.

6.5 Conclusions

The jurisprudence of the Intermediate People's Court of Hefei Municipality, Anhui (HEFEI) on the “true sale” of KaiDi Power Charging Right ABS is a correct understanding of the Regulations and legal support. This will undoubtedly be a strong stimulant for the development of China’s assets securitization market going forth.

“True sale” still has legal obstacles in China. The legislative level of the Regulations is relatively low. Therefore, it is not enough to stipulate in the Regulations only that “the underlying assets are independent of the inherent property of the

originators, SPV administrators, trustees and other business participants", and it is impossible to offer up relevant provisions of the Bankruptcy Law to justify "true sale" as explained below.

Some clauses in China's Bankruptcy Law limit the realization of the ultimate goal of "bankruptcy remoteness" and "true sale" in assets securitization. China's Bankruptcy Law came into effect on June 1, 2007. And yet, until now, more than a decade has passed, it has been unable to adapt to the current blowout of the asset securitization market. (The growth rate of ABS market is 366% since 2014--2019, Chapter 1.1).

For assets securitization with executor future flow as underlying assets, the effect of "true sale" depends on the operation ability of originators. Such ABS, like this case, even if the "true sale" is achieved, ABS investors are also facing a great risk of default on the principal and interest payments.

As an assets service provider, the originators can easily lead to confusion between his own funds and collected funds. If the frequency of payment is too low, the recovery time is too long on the originator's account, there would be a significant delay in payment, and the originator may not be considered to have given up control of the underlying assets.

6.6 Suggestions

The legislative level of the relevant laws and regulations on assets securitization should be raised, and the legal relationship between the originator and SPV should be

modified from the trading relationship to the trust relationship, so as to make the property of SPV independent of the originator's property.

Another suggestion is to amend the bankruptcy law and make special provisions on assets securitization agreements. A judicial interpretation of underlying assets trading are needed, such as the effect of certain special provisions before the bankruptcy of the originator, the performance of the agreement after bankruptcy, claims for compensation, etc. For example, when the originator declares bankruptcy liquidation, once the insolvency representative decides that the "underlying assets trading", it will no longer continue to be operable, the insolvency representative should follow the original intention of assets securitization and regard the underlying assets bought by the SPV as security for the SPV, giving priority to the distribution of the SPV as a secured creditor.

This calls for an upgrade in the training of third-party assets service providers, as soon as possible, to better realize the "true sale" of assets securitization.

7 THE DILEMMA AND SOLUTION OF IPABS—DOUBLE SPV MODEL OF UNDERLYING ASSET RECONSTRUCTION

7.1 Introduction

7.1.1 Background of IPABS Markets

On December 30, 2015, Beijing Culture and Technology Financial Leasing Company (WKe Leasing) issued the "WKe Leasing No.1 ABS" in the inter-agency private placement quotation and service system (inter agency quotation system, IAQS), which opened the path of Intellectual Property Asset-Backed Securitization (IPABS) in China. According to the annual report of national technology market statistics in 2019, by the end of 2018, there were 24 key technology trading institutions in China, with 9,436 technology contracts concluded, and the transaction amount was 71,661.19 million RMB. Among these transactions, the number of patent applications is 1.542 million, accounting for 55% of the world's five largest intellectual property offices, indicating that China has become a world patent power. As of July 2020, China's financial market has issued a total of 11 IPABS products, with an issuance scale of 5.336 billion RMB. With the rapid development of the knowledge economy, intellectual property has increasingly become an important factor affecting the core competitiveness of the country. (Table 7.1)

Small- and medium scale enterprises are the main force in the possession and use of intellectual property. In the patent survey report of 2018, the State Intellectual Property Office found that more than 60% of the patentees were SMEs. In addition, the capital investment required for the transformation of scientific and technological

achievements increased geometrically. However, the financing channels of small- and medium-scale enterprises are very limited. According to the patent survey report of the State Intellectual Property Office in 2019, 90.2% of the R&D expenses of enterprises come from their own funds. The reason is that these innovative companies have not accumulated enough credit; it is usually difficult to obtain credit support from commercial banks. Owners are reluctant to disclose technical information and want to retain control and management of the company, so venture capital is not suitable for these start-ups either. On the other hand, the exploration of IPABS to support the development of small- and medium-scale high-tech enterprises has been highly valued by the government, the market and enterprises.

On July 23, 2020, the State Council issued the circular on the reproduction and promotion of the Sixth Batch pilot reform experience in the pilot Free Trade Zone[30], with 37 pilot reform experiences copied and promoted, among which IPABS were included.

7.1.2 Problem Statement

The rapid rise of China's intellectual property market is in sharp contrast to the slow development of the IPABS market. First, in terms of the issue size. The issuing scale of IPABS in China is relatively small, accounting for only 0.06% of the total issuing scale of the asset securitization market (as of July 2020); secondly, in terms of basic asset types, under China's current issued IPABS products, the underlying assets are not intellectual property in the true sense, but derivative rights of intellectual property (including lease, factoring, royalty and small loan claims).

[30] 2020 年 7 月 23 日，国务院发布《关于做好自由贸易实验区第六批改革试点经验复制推广工作的通知》http://www.gov.cn/zhengce/content/2020-07/07/content_5524720.htm

Table 7.1 Status of Eleven IPABS Products (As of July 2020)

No.	Abbreviation	Issue Place	Complete Name of Product	Asset	Issuance Amount（100 M RMB）	Issue Date
1	WKe (2015-1）	IAQS	Beijing Culture and Technology Financial Leasing ABS (2015) No.1	Leasing claims	7.66	2015/ 12/30
2	WKe (2017-2)	IAQS	Beijing Culture and Technology Financial Leasing ABS (2017) No.2	Leasing claims	4.48	2017/ 09/12
3	WKe (2018-3)	IAQS	Beijing Culture and Technology Financial Leasing ABS (2018) No.3	Leasing claims	8.39	2018/ 03/12
4	QiYSJ (2018-1)	SHSE	Qiyi Century Intellectual Property Supply Chain Finance ABS (2018) No.1	Factoring claims	4.70	2018/ 12/24
5	WKe ABN (2019-1)	Interbank market	Beijing Culture and Technology Financial Leasing Company (2019) No.1 ABN	Leasing claims	7.70	2019/ 01/28
6	WKe (2019-1)	SZSE	First Capital Beijing Culture and Technology Financial Leasing ABS (2019) No.1	Leasing claims	7.33	2019/ 04/04
7	G ZHuanLi (2019-1)	SZSE	XingYeYuanRong - Guangzhou Development Zone Patent License ABS (2019) No.1	Charging right	3.01	2019/ 09/11
8	IQiYi (2019-1)	SHSE	CITIC Securities - IQIYI Intellectual Property Supply Chain Finance ABS (2019) No.1	Factoring claims	5.27	2019/ 11/15
9	GXinTou (2019-1)	SZSE	PingAn Securities - High-tech Investment Intellectual Property ABS (2019) No. 1	Petty loan	1.24	2019/ 12/09
10	PuC (2020-1)	SHSE	Pudong Scientific and Technology Innovation Intellectual Property ABS (2019) No.1 (Epidemic Prevention and Control)	Charging right	0.38	2020/ 03/04
11	GXin (ZhongS) (2020-1)	SZSE	Nanshan District - Zhongshan Securities - High-tech Investment Intellectual Property ABS (2019) No.1 (Epidemic Prevention and Control)	Petty loan	3.20	2020/ 03/25
Total					53.36	

Source：CNABS（China asset securitization analysis, www.cn-abs.com）

Note：There are also 7 storage rack products, with a total storage rack scale of 11 billion RMB.. It is not included in the statistics because its trading structure is similar to that of the products already issued.

Note: "-1, etc. is the first product in the same line for year of 2019. 2020, etc.

Based on this condition, this research aims to answer the following questions through the exploratory research on Four IPABS products, specifically:

(1) What are the difficulties of IPABS in China?

(2) What kind of intellectual property can be securitized?

(3) Is there a solution of IPABS that can be replicated and promoted?

7.2 Literature Review

7.2.1 The Operational Dilemma of IPABS

(1) The choice dilemma of intellectual property rights

洪艳蓉 (2013) pointed out that the patent itself is not suitable for securitization. This conclusion shows the characteristics of intellectual property, such as the uncertainty of value, the specificity of assets, the unique risk and the difficulty of disposal.

(2) The operation dilemma of intellectual property rights

周丹妮 等 (2020) argues that the following deficiencies exist in the securitization of intellectual property rights. Firstly, the generation of intellectual property cash flow depends on the operation of the original owners; secondly, most of the financing enterprises are small- and medium-scale enterprises, and the operation of intellectual property needs the external credit enhancement of strong subjects.

(3) The "transfer" dilemma of intellectual property rights

陶红武 (2011) also argues that some intellectual property rights have two rights: property rights and personal rights. Personal rights cannot be transferred, only property rights can be securitized.

(4) The scale dilemma of intellectual property rights

周丹妮等(2020) argues that intellectual property has the characteristics of fragmentation and heterogeneity, which usually cannot meet the scale requirements of the underlying assets.

7.2.2 The Theoretical Dilemma of IPABS

(1) The “bankruptcy remoteness” dilemma of IPABS

黄光辉 (2009) argues that it is difficult for the underlying assets in IPABS to achieve “bankruptcy remoteness” from a Special Purpose Vehicle (SPV). The reason is that while transferring intellectual property rights to SPV to achieve risk isolation, it may also isolate the connection between intellectual property assets and other complementary resources, resulting in its failure to maximize its value.

(2) The dilemma of "right basis" of intellectual property

朱晓喆 (2019) argues that those claims that do not exist in reality and are expected to be obtained belong to future claims. When transferring the future claims, if the start dates and stop conditions of the rights are clearly defined, and the continuous relationship between the claims and liabilities is retained, this is known as "future claims with right basis". Transferring the future claims with right basis, when the creditor's rights occur, the transferee can directly obtain the claims, and the underlying assets can realize risk isolation. When a contract is concluded, when subsequent events occur, the right is called “future claims without right basis”. The assignee can only obtain the right through the assignor and the underlying assets cannot realize the risk isolation from the assignor.

It can be inferred from the above viewpoint that intellectual property is a kind of "future claims". The premise of its securitization is to solve the dilemma of "right basis",

that is, it needs to clearly define the start date and stop conditions of rights, as well as the continuous relationship between claim and debt, so as to realize the "transferability" of underlying assets and then realize the "risk isolation"

7.2.3 Double SPV theory of ABS

洪艳蓉 (2013) discussed the legal logic and risk regulation of double SPV ABS by taking the beneficial right of trust as an example. 洪艳蓉 considers that the double SPV ABS is a Chinese characteristic and is not particularly related to other countries, and the realization of enterprise's financing through the construction of the trust beneficial right as a compliant underlying asset is a financial innovation formed under the promotion of financial intermediaries and in line with commercial rationality.

7.2.4 Comments of the Literature

Reviewing the literature of IPABS, this study raises the following thoughts:

(1) How to solve the dilemma of the operation level of IPABS?

The particularity of intellectual property determines that it is not suitable for securitization. Can we consider the derivative rights of securitization?

The operation ability of the originator is weak. Can we consider imposing strong external credit enhancement?

It is difficult to scale intellectual property transaction. Can we collect different types of intellectual property and combine different attributes of financial assets to expand the scale of underlying assets so as to achieve the scale effect of securitization?

(2) How to solve the dilemma of IPABS theory?

The theoretical dilemma of IPABS includes "bankruptcy remoteness" dilemma and

"right basis" dilemma. Is the purpose of securitization to destroy the risk of intellectual property or to transfer and disperse it?

To answer problems above,, this research proposes a double SPV model of underlying assets reconfiguration. The underlying assets should be rebuilt with double SPV to solve the operational and theoretical difficulties of IPABS.

7.3 Possible Contribution

First, from the essence of asset securitization, this study combs the difficulties and causes of IPABS in China's financial market. Second, through the summary of four IPABS products, this research puts forward the reconstruction model of underlying assets, which provides a theoretical basis for the replication and promotion of IPABS in China.

7.4 Research Design

The research presented here explores the problems and possible prospects of IPABS under the current financial market conditions in China. The research focuses on the selection and reconstruction of underlying assets of IPABS, that is, what kind of underlying assets can be securitized.

7.4.1 Research Method

This case study is applicable to observe and study the series of changes in enterprises (Pettigrew, 1990), which is consistent with the development and change of IPABS in China. Compared with a single case study for challenging a theory, the multi case study approach is more suitable for constructing theory (Yin, 2003). Although and

earlier work, it holds true today, Eisenhardt (1989) also argued that the multi case study supports the conclusion by case duplication. This research attempts to find the similarities and differences of different types of products in the selection of the underlying assets by using multiple case studies, and carries out an in-depth analysis, aiming to summarize the logic and path of underlying assets selection of IPABS.

7.4.2 Cases Selection

The research period is from December 2015 to July 2020. During this period, China's financial market began to practice IPABS, and successfully launched 10 IPABS products, as shown in Table 7.1. State Policies Supporting the IPABS are in Table 7.2. The underlying assets of these 10 products can be divided into four categories, namely leasing claims, patent license fees charging rights, factoring claims and petty loan claims. In this study, four cases are selected to represent a class of underlying assets. They are: Case 1. WKe Leasing ABN (2019-1); Case 2. GZHuan Li patent ABS (2019-1); Case 3. IQiYi factoring ABS (2019-1); and Case 4. GXinTou petty loan ABS (2019-1). (Note: "-1" is the first product in the same line for year of 2019, 2020, etc.)

7.4.3 Data Collection Methods and Research Credibility

The case data are all derived from a database -- "China asset securitization analysis". The in-depth discussion with experts was arranged in August 2019 to analyze and refine the theme of how to securitize intellectual property rights under the topic of "solving the financing difficulties of small- and medium-scale science and technology enterprises through the securitization of intellectual property rights".

Table 7.2 State Policies Supporting IPABS

Date	Policy	Content
2018/04	"Guidelines on Supporting Hainan in Furthering All-Round Reform and Opening up", Xinhua news agency, April 14 http://www.gov.cn/zhengce/2018-04/14/content_5282456.htm	Encourage the exploration of IPABS and improve the intellectual property credit guarantee mechanism
2019/02	"Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area》"CPC Central Committee and State Council http://www.xinhuanet.com/politics/2019-02/18/c_1124131474.htm	Carry out pilot projects of IPABS
2019/06	"Further implement the national intellectual property strategy and accelerate the construction of a powerful intellectual property country in 2019". The state council https://www.cnipa.gov.cn/art/2019/6/19/art_53_117937.html	Encourage Hainan free trade zone and Xiongan new area to explore and carry out IPABS financing
2019/08	"Opinions of the CPC Central Committee and the State Council on Supporting Shenzhen in building a Socialist Pilot Demonstration Zone with Chinese Characteristics" Xinhua News Agency, Aug. 22 http://www.gov.cn/gongbao/content/2019/content_5425325.htm	Explore the securitization of intellectual property rights, standardize and orderly build intellectual property rights and scientific and technological achievements property rights trading center
2020/05	"Notice on the Construction of IPR Operation Service System by 2020" Treasury (2020) No. 40（2020） http://www.gov.cn/zhengce/zhengceku/2020-05/07/content_5509474.htm	Expand the financing scale of intellectual property pledge and promote the securitization of intellectual property in accordance with laws and regulations
2020/07	"Notice on Replicating and Popularizing the Experience of the sixth Batch of Pilot Free Trade Zones" State Council No. 96 (2020) http://www.gov.cn/zhengce/content/2020-07/07/content_5524720.htm	Encourage the replication and promotion of IPABS

Source: the author collates the information from the official website of the Chinese government

7.5 Case Analysis

7.5.1 Background of the Cases

Case 1. WKe Leasing ABN (2019-1)

In order to repay bank loans, adjust the company's debt structure and supplement working capital, WKe Leasing sold 11 leasing claims held to CCB Trust Co., Ltd. (CCB trust) on January 30, 2019 in the national inter-bank market. CCB trust issued the ABN in the inter-bank market, with a financing scale of 770 million RMB.

WKe Leasing is a subsidiary of Beijing Cultural Investment and Development Group Co., Ltd. ("Cultural and Investment group"), which takes intangible assets (copyright, copyright and patent rights) of cultural enterprises as the leasing object to explore innovative business of financial leasing. Its business model is mainly after-sale leaseback and a small amount of direct leasing. Six of the financial leasing assets corresponding to the above 11 leasing contracts are intangible assets (including copyright, patent right and trademark right). Most of the tenant's customers are asset light business, so it is difficult to control the risk. Therefore, the company's risk provision has been increased year by year. The company's source of funds is relatively single, mainly including loans from financial institutions, shareholder loans and asset securitization. Cash infusion is the main source of funds from financial institutions.

Case2. GZHuan Li Patent ABS (2019-1)

On August 9, 2019, Kaide Leasing, the originator of GZHuan Li ABS(2019-1), sold the license fee charging rights under 11 patent license contracts to the "ABS program of patent licensing in Guangzhou Development Zone" (The program), which was set up by XingY asset management company, and the securities were listed on Shenzhen Stock Exchange on August 26 and realized financing of 301 million RMB.

Kaide Leasing is a Sino foreign joint venture company in Guangzhou Development Zone. The controlling shareholder is Guangzhou Development Zone Financial Holding Group Co., Ltd., The actual controller is the Management Committee of Guangzhou Economic and Technological Development Zone. This ABS program is set up by Guangzhou Development Zone to solve the financing problem of high-tech enterprises in the zone. The assets entering the pool hold the right to charge patent license fees. The

corresponding 11 patent customers are all high-tech private enterprises located in Guangzhou Development Zone. Based on the financial practice of intellectual property pledge financing and intellectual property operation and the development fund, Guangzhou Development Zone started this program to explore what is workable with the IPABS. This is another innovative practice of Guangzhou Development Zone to run through the life cycle of the development of high-tech enterprises and build the financial capital chain of intellectual property rights.

Case 3. IQiYi Factoring ABS (2019-1)

In order to improve the liquidity of factoring claims and broaden the sources of funds, Shenzhen Qianhai Yifang Yingsheng Commercial Factoring Co., Ltd. (YingS Factoring) sold 12 accounts receivable of 11 original creditors to CITIC Securities's "CITIC Securities IQiYi intellectual property supply chain financial asset support program" (the "program") in November 2019. The program is to issue securities based on the 12 accounts receivable claims, realizing financing of 527 million RMB. The 12 accounts receivable claims of the program are generated by suppliers (originators) that are in the domestic service trade business (including intellectual property service trade, such as copyright licensing or commissioned production of films, TV series and variety shows) and other services. The feature of this program is that the core debtor initiates reverse factoring. The core debtor is Beijing QIYI Century Science & Technology Co., Ltd. ("Qiyi Century") Its business model is film and television copyright distribution, and its main customer is Beijing IQIYI Science and Technology Co., Ltd. (the common debtor of the program). The continuous purchase of film and television works has led to the increase of accounts payable of Qiyi Century year by year. The

advantages of reverse factoring asset securitization to Qiyi Century are to extend the account period of its own accounts payable, assist the upstream customers recover the payment as soon as possible, relieve the capital pressure, benefit from the interest spread of securitization funds, and enhance the visibility of the company's capital market. Shenzhen Qianhai Yifang Yingsheng factoring Co., Ltd. is a wholly-owned subsidiary of Shenzhen Qianhai Yifang Supply Chain Management Co., Ltd. In recent years, the state has issued a series of policies to ensure that the factoring industry develops rapidly. At present, the factoring market has entered a mature stage in the field of standardized reverse factoring, and Qianhai has been far ahead in this field. The strategic positioning of YingS factoring is to further consolidate the group's absolute advantage in the factoring field, and improve the group's profit level and industry brand.

Case 4. GXinTou Petty Loan ABS (2019-1)

In order to improve the liquidity and expanding funding sources, on December 6, 2019, ShenZhen GXinTou petty loans company sold 15 petty loans to PingAn securities setting up "PingAn securities - GXinTou No.1 Intellectual Property support program" ("the program"), raising 124 million RMB. One of the characteristics of this program is that all the borrowers of the bottom assets are small high-tech enterprises, which are greatly affected by the changes of the macroeconomic policy, having a weak anti-risk ability and being in great risk of default. Another characteristic of this program is that the collateral of the underlying assets are all intangible assets -- Intellectual Property Rights, which are subject to undervalue pledge, value fluctuation and high uncertainty of liquidity difficulty.

At present, microfinance institutions are becoming an important provider of funds

for small and micro businesses. However, limited funding sources and tight asset liquidity have led to low-risk resistance, which has become a bottleneck for the development of petty loan companies. The securitization of petty loans has a good practice in solving the above problems.

7.5.2 Analysis of Risk Characteristics

The comparative analysis of the Four target cases is carried out according to the cash flow risk characteristics of the securities end, the asset end and the bottom assets, as shown in Table 7.3.

From the securities side, the four products have the following characteristics. First of all, the issuance dates are all concentrated in 2019, which indicates that 2019 is the year of the rise of IPABS in China. IPABS is an innovation in the China financial market, which is in the exploration and pilot stage. Second, the size of the products is relatively small (the highest is 700 million RMB, WKe ABN; the minimum is 124 million RMB, GXinTou ABS), indicating that China's intellectual property transaction and operation are in the initial stage and have not yet formed economies of scale. Third, the product term is short, with the longest expected to be 5 years (GZHuanLi ABS), and the shortest 1 year (GXinTou ABS). This is consistent with China's official statistical data (the average duration of effective invention patents in China from 2015 to 2018 is 6.05 years) (the 2019 China Patent Survey report), reflecting the limited ability of underlying intellectual property to generate any cash flow (compared with 18.39 years for infrastructure ABS). Fourth, the debt rating is higher (the priority rating of the 4 products is AAA) and the secondary proportion is smaller (the least is 0.81%, GXinTou ABS; the maximum is 10.39%, WKe ABN), indicating that the repayment of the

product is more dependent on the overall credit and external guarantee (in contrast, the initial grade of priority C of Jingdong Baitiao 2018-22 is BBB-; the average proportion of secondary C of petty loan ABS in the exchange market is 7.84%).

On the asset side, the four products are also remarkably consistent. First of all, the underlying assets are not intellectual property rights themselves, but the derivative rights of intellectual property rights, such as financial lease claims, factoring claims and petty loan claims. The only patent license royalty product, GZHuanLi ABS (2019-1), is also considered as a substantial lease creditor's right in the industry due to the involvement of the finance leasing company. Secondly, from the perspective of credit enhancement measures, the internal credit enhancement of the asset pool of the product does not meet the market requirements, and investors rely more on the external credit enhancement of strong subjects (IQiYi ABS is the third party guarantee, GZHuanLi ABS, GXinTou ABS are both the parent company guarantee, and WKe ABN is the originator and parent company guarantee).Third, from the perspective of the characteristics of asset pool, the dispersion of assets into the pool is not ideal, the geographical distribution and industry distribution of financing enterprises are relatively concentrated. For example, GZHuanLi ABS are all distributed in seven industries located in the Guangzhou Development Zone, the debtors of IQiYi ABS are all distributed in the online video industry in Beijing, and the borrowers of GXinTou ABS are all distributed in three industries in Shenzhen. Fourth, the cash flow coverage is not adequate. The cash flow coverage of the four products ranged from 1.08 to 1.210. Although they are all greater than 1, they are all somewhat reluctant (the cash flow coverage of the Bank of Communications Schroder Fund Management Co., Ltd. CRRC Xinrong ABS is 1.33).

Table 7.3 Analysis of Cash Flow Risk Characteristics of Target Cases

Risk Characteristics of Cash Flow	Project	Case 1. Financial Leasing	Case 2. Licensing Model	Case 3. Supply Chain Model	Case 4. Pledge Model
		WKe Leasing ABN （2019-1）	GZHuanLi Patent ABS（2019-1）	IQiYi Factoring ABS（ 2019-1）	GXinTou Petty Loan ABS（2019-1）
Securities	Issue date	2019/01/28	2019/09/11	2019/11/15	2019/12/6
	Listing location	Interbank market	SZSE	SHSE	SZSE
	Issuing scale (RMB)	770 million	301 million	527 million	124 million
	Debt rating	AAAsf	AAA	AAA	AAA
	Securities layering	Priority89.61%; Secondary, 10.39%	Priority95%; Secondary, 5%	Priority, 94.88% Secondary, 5.12%	Priority, 99.19% Secondary : 0.81%
	Securities maturity	4.33 Yr	5 Yr	1.95 Yr	1 Yr
Underlying assets	Underlying assets: existing claims	Leasing claim	Royalty receivables for patent licenses	Factoring claim	Petty loan claim
	Originators	Beijing Culture and Technology Financial Leasing Co. LTD	Guangzhou Kaide Financial Leasing Co. LTD	Shenzhen Qianhai Yifang Yingsheng Commercial Factoring Co. LTD	Shenzhen GxinTou Petty Loan Co. LTD
	Asset scale of originators before issuance: RMB	11.75 billion	0.647 billion	0.1 billion	1.65 billion
	The role of intellectual property	Lease subject matter	Secondary license right	Right of use	Loan pledge
	Credit enhancement: widespread external guarantee	External guarantee from originator and its parent firms	External guarantee from originator and its parent firms	External guarantee from the third party	External guarantee from the parent firm(s), the third party and intellectual property pledge
	Dispersion	8 industries and 5 regions.	7 industries	In the online video industry of Beijing metropolitan area	Distributed in three industries in Shenzhen
	Cash flow forecast: all cash flow coverage multiples are greater than 1	1.17	1.21	1.11	1.008
Bottom assets	Source of repayment	Lease payment	License fee	License fee	Principal and interest of petty loan
	guarantee	Guarantee, mortgage, pledged	Pledge ,guaranty	Payment confirmation	Guarantee, pledged
	Stability of intellectual property	Ownership transfer	Use right transfer	Ownership transfer	Ownership transfer

Source：www.cn-abs.com (Chinese only)

Most of the bottom assets are intellectual property royalty cash flow rights. As the cash flow of repayment, the principal and interest payment under these creditor's rights

contracts are all attached with a guarantee. For example, WKe ABN as a real estate business, has land use right and machinery and equipment is the guarantee; GZHuanLi ABS has pledged patent rights; IQiYi ABS has a payment commitment letter of the core debtor; GXinTou ABS has pledged intellectual property and the guarantee of a GXinTou guarantee company. These various guarantees shows that the operating cash flow of intellectual property is generally weak.

7.6 Causes of the Analysis of the IPABS Dilemma

7.6.1 Ownership of Underlying Asset is Not Clear

One of the essential features of asset securitization is that the ownership of the underlying assets must be clear. Only the owner of the asset has the right to sell the financial instrument. When the ownership of the intellectual property as the underlying asset is disputed, the securitization of intellectual property will face uncertainty.

Take the case of 3 IQiYi ABS as an example, its intellectual property rights include the copyright of film, TV series and variety show. In the process of selecting the underlying assets, the following problems will be faced. First, copyrighted music may not belong to the artist. Artists often transferred copyrights to some of their works to record labels, so the amount of the copyright that can be sold is often not significant to form the pool of assets that influence the distribution of their copyrighted works. Second, music copyright is a common form where there may be multiple owners. The co-owners of the copyright have an inalienable right to the entire copyright, and in the absence of an agreement, all co-owners have equal rights over the copyright. If only some of the co-owners participate in the transaction, and they have only the right to

dispose of their shares, the value of the securitization will be reduced. Third, there are multiple rights in music copyright. Most music copyrights include many rights, for example, the songwriter who owns the work, the singer who owns the right to perform the work, and the record producer who owns the right to record and distribute the work. So, the value of music copyright is subject to multiple rights. When dealing with copyrights, the license of relevant rights must be obtained, and the copyright profits need also be shared. The complexity of ownership of intellectual property makes it very difficult to directly securitize intellectual property as an underlying asset（马忠法等, 2019；阳东辉，2014).

7.6.2 The Underlying Asset does not Realize "True Sale"

The second essential feature of asset securitization is the "bankruptcy remoteness", that is, after the underlying assets are sold to the SPV, they are protected by the trust law and isolated from the bankruptcy risk of the originators. If the underlying asset cannot be separated from the originators, even if a SPV is used, legal "bankruptcy remoteness" cannot be achieved.

Take the patent right in case 1. WKe ABN above, for an example. A patent right is a kind of defensive right, the patentee generally uses alone. During the patent right securitization, if the underlying asset is used by the original owner, the patent license fee and the enterprise income will be completely confused, and the cash flow of the underlying asset will be controlled by the originators. Moreover, the cash flow of the underlying assets of securitization often requires the asset service providers to collect and pay. The exclusivity, complexity and technicality of patent rights make it impossible for asset service providers, i.e., companies handling intellectual property rights, to

socialize, and only continue to employ the original intellectual property rights holders. The above two features will seriously affect the “bankruptcy remoteness” effect of IPABS. If the underlying asset is not independent, the cash flow of the underlying asset will be mixed with other financial matters or even controlled or misappropriated by the originators, thus damaging the rights and interests of ABS investors.

7.6.3 Unpredictable Cash Flow of Underlying Assets

The third essential characteristic of asset securitization is that the underlying assets have a stable and a predictable cash flow. The principal and interest of the senior securities investors need the future cash flow of the underlying assets to pay off fees, etc. If the underlying assets cannot generate a stable and a predictable cash flow, the asset-backed securities (ABS) will face the risk of default. The dispersion of underlying assets has a great impact on the stability of cash flow (陈焕, 2015). The asset pool composed of multiple intellectual property assets can reduce the risk of insufficient cash flow of a single intellectual property. The basic assets of WKe Leasing ABN are distributed in 5 provinces and 8 industries, and its dispersion is the best among the 4 cases.

In 2003, the securitization of patent license fees for 13 drugs in the United States was successful. One of the important reasons for the success is that the securitization is a diversified patent portfolio. On the other hand, in 2000, the securitization of the license fee of Yale University patent (Zerit) in the United States ended in failure, because of the poor risk resistance of a single patent (阳东辉，2014).

In addition, the changes of market and public taste also have an impact on the

future cash flow of intellectual property. Six years after the issuance of Bowie bonds[31] , the debt rating was downgraded, mainly due to the decline of the record industry（陈焕，2015). In Case 3, the copyright of movies, TV dramas and variety shows in IQiYi ABS also faced the risk of decreasing income of copyright owners due to the changes of market and public taste.

7.6.4 Non-Scale Economy of Product Distribution

The fourth essential characteristic of asset securitization is the continuance and stability of the cash flow of the underlying assets, which requires the securitization transaction to realize scale.

Compared with traditional credit, asset securitization is usually suitable for large-scale financing. This is because, after experiencing such links as “true sale”, risk remoteness, credit enhancement and securities issuance, the product trading and credit chain are too long, and only large-scale operation can eventually cover all kinds of costs (洪艳蓉, 2013). In addition, the greater the number of underlying assets, the larger the asset pool size. For the possible default and early payment, the more sufficient the compensation ability, the more sustainable and stable the future cash flow of the underlying assets. Usually, larger companies have more underlying assets than the small- to median-scale companies. In the United States, enterprises with assets larger than 350 million US dollars are in general suitable for issuing ABS (Lemmon et al.,2014). In China, enterprises suitable for securitization should have an asset scale of more than 620 million RMB (王芳, 2020).

[31] A Bowie bond was a unique type of asset-backed security which used as collateral the royalty streams from current (at the time) and future album sales and live performances by musician David Bowie. https://www.investopedia.com/

In the Four cases of this research, the asset scale of the originators before the issuance is in the order of Case 1. WKe Leasing (11.75 billion RMB, which is ideal), Case 4. GXinTou petty loan (1.65 billion RMB), Case 2. Kaide leasing (647 million RMB), and Case 3. YingS factoring (100 million RMB). The assets of the first three companies are more than 620 million RMB, and they are all suitable for issuing ABS.

Case 3. IQiYi ABS is a special case. The asset scale of the originator, YingS factoring, is only 100 million RMB, while that of the core debtor (Beijing Qiyi Century Technology Co., Ltd.) is 34.85 billion RMB, and that of the joint debtor (Beijing IQiYi Technology Co., Ltd.) is 20.82 billion RMB. As the underlying assets of IQiYi ABS come from Beijing IQiYi Science and Technology Co., Ltd., so the core debtor guarantees IQiYi ABS with its own assets).

It can be seen that under the reverse factoring mode of supply chain, the scale of securitized cash flow depends on the core debtor (while the role of the originators is more embodied as a channel).

7.6.5 The Legal Risk of Securitization is Uncontrollable

"The regulation" of China Security Regulatory Commission (CSRC) requires that the underlying assets of securitization must comply with the provisions of laws and regulations. Due to the particularity of intellectual property, the controllability of the legal risk is questioned by the market when it is used as the underlying asset for securitization.

First, there is the identification risk of a legal subject. Among all kinds of intellectual property rights, copyright practices, creation protectionism, and the

acquisition of its rights does not need to be registered or examined, which also makes the uncertainty of copyright extremely high. Anyone can question whether a work enjoys copyright or not, and the phenomenon of "*YI NV ER JIA*"[32] has already happened at the moment (张敏, 2007). However, the acquisition of patent and trademark rights is subject to the examination and approval by the competent authority, and with the approved patent and/or trademark a certificate is issued that has the legal effect of constructive rights. However, in the examination of patent and trademark applications, the examiner is inevitably limited in knowledge, experience and resources, and may make omissions. Therefore, the intellectual property system is coupled with corresponding rules of objection, by which a third party may apply to the competent authority for declaring the patent invalid or revoking the trademark registration. Once the intellectual property rights of the securitization are declared invalid, the underlying assets of the securitization no longer exist, and the original licensee is no longer obligated to pay the license fee, and the cash flow cannot be generated.

Secondly, there is the potential litigation risk of intellectual property rights. In a high profile case, Adobe, Autodesk and other software companies sued the film producers of “Nezha” for infringement of their rights. They sued each animation film company that appeared at the end of the film for unauthorized use of its mapping software[33].

Third, there is the risk of widespread copyright infringement in the Internet era. For example, many popular books and novels on the internet can be downloaded

[32] Refers to the phenomenon of the same copyright being granted to different people.

[33]Advertisement investigation bureau. How does small company receive invisible big sheet? “Nezha” accused of using pirated software[R/OL].(2019-09-04)，https://baijiahao.baidu.com/s?id=1643733518319037226&wfr=spider&for=pc (Chinese only)

electronically. Many public accounts of apps also push e-books and novels at no cost (刘啸宇, 2020). The risk of widespread copyright infringement in the Internet era has yet been sorted out.

The securitization of intellectual property rights also faces some other legal risks, such as: i) the risk of compulsory license and early termination of intellectual property rights, ii) the risk that the degree of infringement is difficult to identify, iii) the risk that intellectual property rights are difficult to deal with, and iv) the risk that a patent pledge cannot counter the stock license, etc. (袁晓东, 2010).

To sum up, there are five reasons for the dilemma of the use of IPABS. These five causes all come from the intellectual property itself. This dilemma is expected to be solved by avoiding the securitization of the intellectual property itself and choosing to securitize its property rights (royalty claim).

7.7 Resolving the Dilemma of IPABS by " Underlying Asset Reconstruction"

Based on the above, the types of underlying assets discussed are mainly limited to the "royalty claim" of intellectual property rights.

The theoretical model of underlying assets reconstruction based on the above four target cases is mainly focused on "future creditor's rights" of "royalty claim", but it is still expected to find the general rules of assets reconstruction from special cases, so as to guide an increase in future practices.

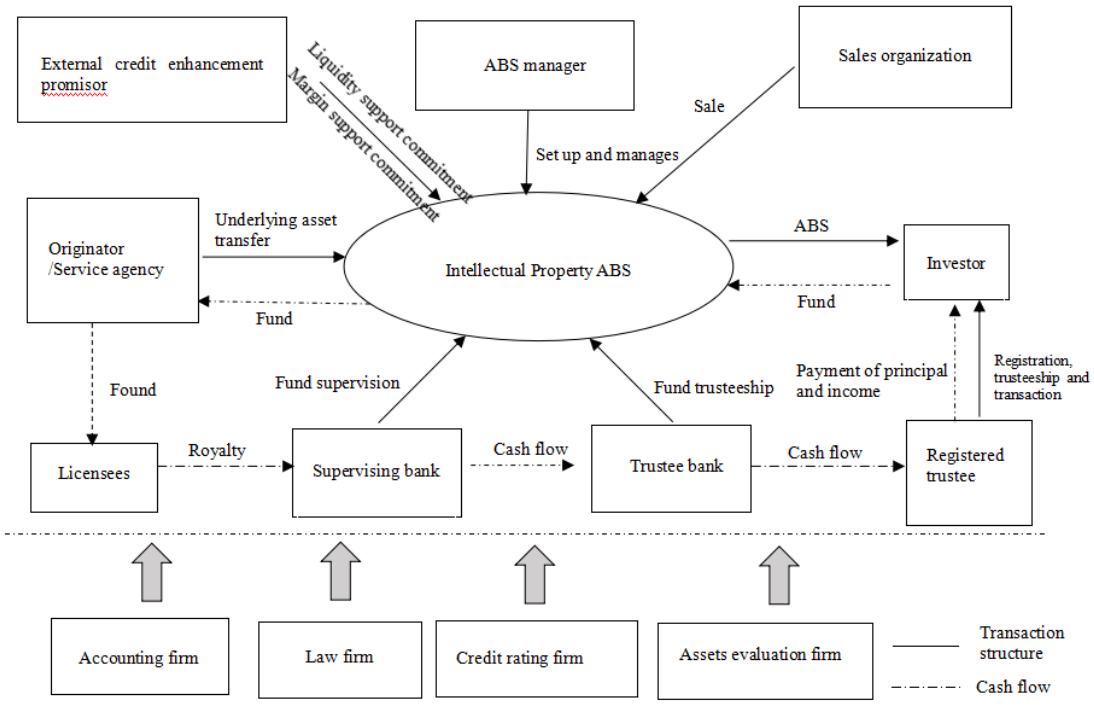
7.7.1 Model Construction

The so-called underlying asset restructuring model refers to the double SPV

structure formed by adding a SPV to the traditional ABS trading structure.

(1) Traditional Transaction Structure of ABS

Figure 7.1 Traditional Transaction Structure of ABS



Source: CNABS

Figure 7.1 shows the traditional transaction structure of IPABS in China. The originator sold the underlying asset to a SPV. The SPV then issued securities backed by the future cash flow of the pooled assets to finance the transfer consideration for the purchase of the underlying assets.

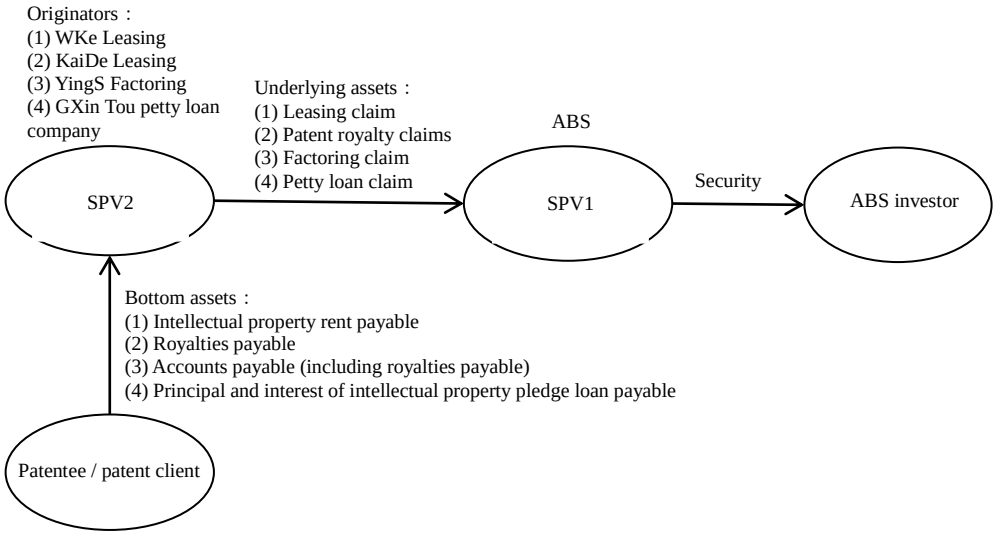
(2) The Double SPV Structure of Underlying Asset Reconstruction

The double SPV model of underlying asset restructuring is shown in Figure 7.2. SPV1 is the new special purpose entity, also known as the bottom asset pool; SPV2 is known as the underlying asset pool. In the circle at the bottom left of the figure, are the

originators' counterparties (also the initial owner of intellectual property rights). Both parties construct the underlying assets by signing a contract.

Before the reconstruction of the underlying assets, the financier, as the originator, directly sells the underlying assets to SPV2 to obtain financing. Under the reconstruction mode, a new special purpose entity (SPV1) is set up by a financial institution, which is located between the financier and SPV2, acting as the originator and forming a new underlying asset.

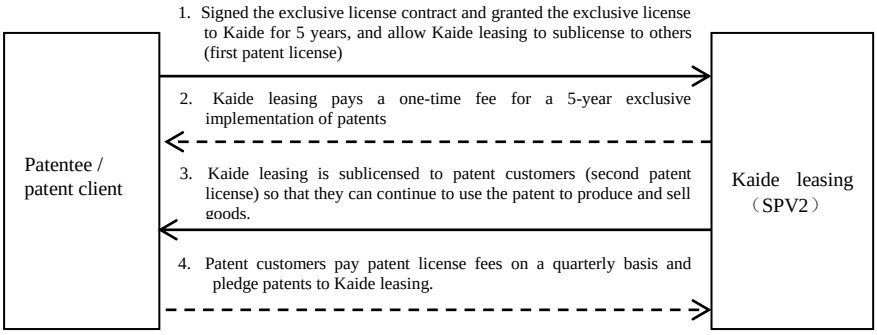
Figure 7.2 Underlying Asset Reconstruction--Double SPV Model of Target Case



SPV1 can be figuratively compared to a "reservoir", whose function is to collect the cash flow of bottom assets and convert its debt attributes. Combined with the above four cases, the purpose of SPV1 can be summarized. Firstly, SPV1 collects the operating income cash flow generated during the period of intellectual property licensing to form a large-scale asset pool. Secondly, SPV1 signs financial contracts with

financing enterprises to endow "future claim" with "right basis", or reconstruct them into an "existing claim". Because SPV1 is a kind of financial institution, its financial claims are usually lease, patent royalty, factoring and petty loan claims.

Figure 7.3 Cash Flow Diagram of Underlying Assets--Case 2. GZhuan Li Patent ABS (2019-1)



When the intellectual property is a patent, the patentee is also a patent customer. Figure 7.3 shows the cash flow diagram of bottom assets using Case 2. GZHuanLi patent ABS (2019-1) as an example. The solid arrow in the figure is the transaction behavior, and the dotted arrow is the capital transfer. The unique feature of this transaction structure is that it is the second license of the patent royalty claim. Through the first patent license, the patentee realized the future license fee income in advance. Through the second patent license, the patentee changes his status to become a patent customer (patent licensee), and pays the license fee regularly according to the signed contract, thus forming the bottom asset cash flow.

7.7.2 Resolving the Dilemma of IPABS

(1) Resolution of Compliance Dilemma

The four cases in this research, through the establishment of SPV1, collect the bottom cash flow of intellectual property, add external credit enhancement, ensure that the principal and interest of the financial claim can be realized on time, so as to meet the regulatory requirements of "clear ownership, independence, predictability and specialization" of the underlying assets.

(2) Resolution of Operational and Theoretical Dilemmas

The signing of the contract separates the claim of intellectual property royalties from the ownership, thus avoiding the operational dilemma (such as the dilemma of intellectual property choice and transferability) and “bankruptcy remoteness” dilemma. The specific terms of the contract also ensure that the "future claims" have a "right basis" and realize the "transferability" of the underlying assets.

Take Case 1. WKe ABN (2019-1) and Case 2. GZHuanLi patent ABS (2019-1) as examples. With the help of financial leasing companies, SPV1 is set up. By signing an intellectual property leaseback contract and two patent license contracts, the "patent royalty claim" is separated from the patentee and reconstructed into a "transferable" underlying asset with the effect of "bankruptcy remoteness".

(3) Resolving the Dilemma of "Scale"

Intellectual property itself is characterized by fragmentation and heterogeneity, which makes it difficult to achieve scale, but the monetization of its property rights has the possibility of scale.

The same operation of the four cases in this thesis is to sink the "heterogeneous" intellectual property into the bottom assets, and reconstruct the underlying assets with the "homogeneous" financial claims.

(4) **Solution of Operation Dilemma**

The operation dilemma of intellectual property comes from the characteristics of small enterprises of the licensees. The irreplaceability of intellectual property operators determines that this operation dilemma can only be solved by external credit enhancement.

In the four cases, the credit enhancement measures of the underlying asset side include balance payment commitment and liquidity support commitment; the credit enhancement measures of the bottom asset side include physical asset guarantee and intangible asset guarantee.

The credit enhancement of the bottom assets can also be the payment commitment of the strong debtor (with high overall rating). Taking the Case 3. IQiYi ABS (2019-1) as an example, its bottom assets are owned by small suppliers of intellectual property rights, and its operation ability is weak. The means of credit increase is that the core debtor and the joint debtor issue the payment confirmation letter at the bottom asset level.

7.7.3 Comparison of the Development Space of IPABS

The ideal state of IPABS is to realize the interaction and mutual promotion with commercialization and industrialization, so as to open up more business opportunities. The financial leasing mode of WKe ABN can make the future royalties of the

"copyright" party realize in advance, focusing on the financing function. The supply chain mode of IQiYi ABS can speed up the transactions between the industrial chains, which is convenient for improving the level of the industrial chain. The patent license fee mode of the GZHuanLi patent ABS, reserves the space for commercial and industrial operation, which is more suitable for the application and promotion of a wider range and various fields. From the perspective of development space, intellectual property licensing mode has the greatest advantage, followed by the supply chain mode, and the third is the petty loan pledge financing and financial leasing mode.

7.7.4 The Risk of the Reconstruction Model

(1) Financing function risk

From the process design point of view, in addition to intellectual property pledge mode, only involves one contract exist, the other three have two contracts. In addition, the tax system of China taxes the originator, SPV and investors according to different tax types, the greater the participation the heavier the tax burden. The reconstruction model of underlying assets lengthens the transaction chain and increases the intermediary costs and financing costs.

(2) Risk of ownership change

Financial leasing mode, supply chain mode and petty loan mode all include the transfer of intellectual property rights, and there is the integrity risk of intellectual property rights.

(3) Risk of investors' interest

Becoming the originator, the financial institutions need to play the role of inferior

investors and asset service providers, and their capital strength and performance ability are uncertain.

(4) The risk of "asset credit" being weakened

In the double SPV model, if SPV1 is the beneficial right of trust, the repayment source of ABS is based on the overall credit of the financing enterprise. At this time, the essence of "asset-backed" will change.

7.8 Conclusion

(1) The dilemma of IPABS comes from the intellectual property itself. The particularity of intellectual property makes securitization face many difficulties, such as the uncertainty of value, the specificity of assets and the difficulty of disposal. Therefore, most of the underlying assets of IPABS in the world's mainstream financial markets are not intellectual property in and of itself, but the right of use.

(2) The essence of the dilemma of IPABS is the "future claim" attributes which makes securitization face the dilemma of compliance of underlying assets. For example, the intellectual property cash flow is easily confused with the operating enterprise, which affects its independence; the intellectual property cash flow is generated in future transactions and events, which affects its "specialization"; the intellectual property cash flow depends on the operating capacity of the licensee enterprise, which affects its "continuous stability and predictability".

(3) The purpose of underlying asset reconstruction is to achieve "compliance", and its essence is risk transfer. The double SPV structure reconstructs the bottom assets into standardized financial claims, which meets the regulatory requirements. The

homogeneity of standardized financial claims brings about the scale, which can realize the "replicability" and "popularization" of IPABS. The reconstruction of underlying assets makes the intellectual property rights sink into the bottom assets. The reconstruction does not destroy the risk, but enables it to transfer between more levels and more transaction subjects.

(4) The third article of this conclusion summarizes the general rules of the underlying asset reconstruction. That is, for ABS of any asset category (whether it is existing or future claims), as long as the cash flow of underlying assets has the requirements of compliance and scale, it can be optimized by using double SPV structure.

7.9 Suggestions

(1) Underlying asset reconstruction needs to select financial institutions with a strong capital strength and asset management ability, so that they can play the role of active resource integration and risk management as the originators.

(2) Avoid using the beneficial rights of the trust is best practices. The cash flow of the beneficial right of the trust depends on the repayment of the principal and interest of trust loan, and the repayment source is based on the total operating income of the financing enterprise. At this time, underlying assets reconstruction causes the "asset credit" essence of securitization to become the "overall credit" of financing enterprises.

(3) Reconstruction should adopt the mode of a license fee. Because this mode only transfers the right of use and does not change the ownership, the legal risk is small, and the future development space is significant.

(4) It is possible to diversify the underlying assets and realize the scale economy. China is a major creator of intellectual property rights, but it is not a strong country of intellectual property rights. In 2018, China's invention patent applications accounted for 55% of global patent applications, but only 36% of domestic patent applications. The proportion of intellectual assets in the entire societies created by R&D expenditure is still small. In 2018, the transaction amount of technology contracts involving intellectual property is 681.341 billion RMB, accounting for 34.66% of the R&D expenditure of the entire country. Therefore, the scalability of IPABS (in the four cases, the maximum issue scale is only 770 million RMB) is difficult. It is recommended to consider the mode of intellectual property royalty claim plus accounts receivable at the level of bottom assets, so as to increase the asset number and realize the scale of securitization.

(5) It is advised to introduce an internet platform plus the block chain method to ensure the authenticity and traceability of underlying assets. Under the restructuring mode, there are many transaction levels, and the cash flow path is long, so it faces greater operational risks. With the help of a high-tech risk control mode, due diligence cost of small enterprises can be reduced and the promotion of the profit space of securitization can be realized.

(6) It is also recommended that the government of China give stronger support to promote the activity of the financial market. For example, on the asset side, discounts and guarantees are provided to improve the expected rate of return of underlying assets. In the security side, tax preference is given to reduce the issuance cost.

7.10 Research Limitations

Based on the analysis of the four cases, the conclusion of the research has some limitations. Whether the model used here can be applied to different periods of economic development, industries, regions, and enterprises to carry out securitization with different types of intellectual property rights requires further verification.

8 CONCLUSIONS

Securitization has made great strides to meet the market needs over the past 50 years. This is because the market is continuing to provides many enhanced benefits to participants. Most regulators believe that securitization strengthens the entire banking system through credit risk transfer and diversification. This author supports this view. Securitization helps non-financial enterprises realize light assets and de-leverage through "true sale" and "off-balance sheet". Securitization can also select the underlying assets of "future claims" to help small- and medium-scale enterprises (SMEs) in their financial needs. To improve the efficiency of financial markets and macroeconomic conditions, the practice to continue to use securitization as a financial vehicle is strongly encouraged. However, with the expansion of securitization in the market, the degree of innovation and complexity of trading also broadens. The requirements of the securitization market for the compliance of the underlying assets, the requirements for the financial status of the originators, the excessive dependence on the external credit rating, and the opaque information of the securitization products pose challenges to appropriate supervision.

Securitization began in the 1970s with the structured financing of mortgage loans by a US government-sponsored agency, the Government National Mortgage Association (Ginnie Mae). The securitization of non-mortgage assets began in March of 1985 in US when Sperry Corporation, a major American equipment and electronics company, issued

$192.5 million of securities backed by computer lease receivables (Minton et al., 1997).

In August, 2005, China Unicom issued the first asset securitization product known as "China Unicom CDMA network lease ABS", Shanghai Stock Exchange, supported by the right of return on network lease. In December 2005, the China Development Bank and the China Construction Bank issued the first asset securitization products in the inter-bank market with the support of individual housing loans and credit assets, respectively. This event marks the formal birth of asset securitization as a direct financing method in China's capital market (林华, 2015).

From a capital cost perspective, when the comprehensive financing cost of bonds and stocks are high, commercial banks will then choose loan securitization instead. From the perspective of profitability, shadow banks in China's financial system have developed rapidly in recent years. The high yields of online P2P financial products have had a significant impact on the interest margin profit model of banks. Commercial banks have had to look for new profit growth opportunities through financial innovation. Asset securitization represents one of these opportunities, allowing banks to sell low-profit loans and invest in high-profit projects, thus improving their business performance. From the perspective of regulatory arbitrage, if commercial banks need to improve their balance sheets to meet regulatory requirements, they will choose loan securitization. In 2009, to cope with the global economic recession caused by the US subprime mortgage crisis, the Chinese government launched a "four trillion" RMB economic stimulus plan. The implementation of the plan has led to overinvestment in China's economy, the accumulation of commercial bank’s non-performing loans , and the rapid growth of shadow banks in the financial system. A large number of loans were

deposited on the balance sheet of commercial banks, constituting a risk to these banks and the broader financial system. In order to deal with the possible systemic financial risks, the Chinese government implemented a series of financial reform measures, such as "streamlining administration and delegating powers" and "lenient entry and strict control" for asset securitization business in 2014, and the "Filing System" was introduced. In 2016, the supply side structural reform was launched. In 2019, Premier Li Keqiang once again stressed the "innovation driven development strategy" in the government work report. Based on the above, as a structural innovation instrument, asset securitization is expected to play an important role in the financial reform of China.

This thesis provide a valuable perspective to study the motivation of asset securitization of commercial banks and non-financial enterprises under the background of supply-side structural reform and its impact on the financial market, and to examine the current development of China's asset securitization market from the two aspects -- "true sale" and "the selection of underlying assets".

Firstly, this thesis examines the role of loan securitization in China's supply-side structural reform from 2012 to 2019 by testing the hypotheses in securitized bank's five determinants, and then using Logit and Tobit regression to test from the two dimensions of securitization, probability and scale. It is found that the motivation of loan securitization is "cost advantage exploitation" and "performance promotion", and "risk transfer" motivation did not exist. This thesis found that the motivation of large banks is "cost advantage exploitation", while the motivation of small banks is

“performance promotion” and “risk transfer”. The implementation of the “Filing System” caused the motivation of loan securitization to change from "regulatory arbitrage" to "performance promotion". Using the "substitution variable" to further test the motivation of "risk transfer", we determined that the securitization banks still do not have any motivation of "risk transfer". Compared with the loan risk, the default risk of the bank itself can rather affect its securitization decision. The lower the default risk, the higher the tendency of loan securitization. This research also assumes that loan securitization has effects on financial reform. Sensitivity analysis find that securitization does not play a role in the banking and financial markets. Regression analysis of loan deposit dependency shows that securitization alleviates the relationship between loan and deposit, and this effect is particularly significant in large banks after the “Filing System” was institutionalized. The conclusion here is that large banks with more assets and low default risk tend to securitization. With the maturity of the market, the motivation of bank’s loan securitization is changing from "regulatory arbitrage" to "performance promotion". The contribution of loan securitization to China's financial reform is reflected in the easing of the relationship between bank loans and deposits. There is no evidence that securitization plays a role in improving the income structure of banks nor improving the investment efficiency of financial markets.

Secondly, this thesis analyzes the influencing factors of asset securitization decision making of China's non-financial enterprises under the background of supply-side structural reform from 2012 to 2017. First, this research carried out a full

sample Probit regression. On that basis, it is found that the influencing factors include asset scale, concentration of accounts receivable, R&D expenses and asset liability ratio. There are threshold and scale economy in asset securitization. There is a concave relationship between asset liability ratio and the securitization decision, which indicates that the company's creditors have constraints on ABS issuance. Enterprises with lower R&D costs tend to have higher asset securitization tendencies. Non-financial enterprises use off-balance sheet to reduce their leverage, which reflects the policy influence of regulatory arbitrage under the background of supply-side structural reform. Second, the samples are grouped according to large companies and large ABS companies to test the robustness of Probit regression results. The result shows that asset scale, R&D cost ratio and asset liability ratio are robust. Large non-financial enterprises tend to securitize accounts receivables, and the securitized assets of large ABS companies are other assets besides accounts receivables (mostly real estate). Third, the study also examines the impact of ownership and credit rating on securitization decision. The author finds that the form of ownership does not affect the securitization decision, but credit rating does and is concentrated in AA+. It can be explained that at present under the private market, ABS investors are mostly commercial banks, whose purpose of investing in ABS is to release capital. The conclusion is that small firms with lower credit ratings are not welcome in China's securitization market. The purpose of ABS issues by large enterprises is to reduce leverage. Small and medium-sized securitization companies that usually have financing constraints, so they face financial difficulties. The creditors of

securitization companies have lower restrictions on ABS issuance because of poor corporate governance mechanism. ABS investors are mainly commercial banks, whose investment purpose is regulatory arbitrage of capital releasing.

Thirdly, this study evaluates the China's standards of securitization market for "true sale" by analyzing the "KaiDi event" that first occurred in 2018. First of all, the author combed the claims of the four parties in the KaiDi event, and found that the ownership of "30 million RMB of electricity charges and subsidies payable" is the core of the event. The Intermediate People's Court of Hefei Municipality, Anhui (HEFEI) finally make a decision that the ownership of the fund belongs to the "DaHua Company", the asset manager of ABS. The result of the judgment indicates that the ownership of the fund cannot define that of the underlying assets, whose ownership is agreed in advance by legal contracts, which has the characteristics of "true sale". Second, this thesis analyzes the financial situation of KaiDi Power Company (KaiDi), one party to the KaiDi event. The thesis found that the deterioration of the originators financial situation is the cause of liability contract dispute. The confusion of cash flow of underlying assets and originators leads to the risk of "true sale". It is concluded that the core issue of "true sale" is the definition of underlying assets. The case of the KaiDi event successfully separates the ABS originators and the underlying assets beneficiary and thereby sets the Chinese standard for "true sale".

Fourth, this thesis studies the dilemma of IPABS (IPABS) and its solutions. First, it selects four typical cases from 11 products published in the market, representing four

models -- financial leasing, licensing, supply chain and pledge. Second, from the perspective of cash flow, the research analyzes the risk characteristics of the four cases according to the following sides: security, underlying asset and bottom asset. Third, combined with these four cases, the study analyzes the five causes of the dilemma of IPABS from the perspective of underlying asset selection. Fourth, the research proposes a double SPV structure and compares it with the traditional ABS structure, then analyses its role in resolving the dilemma of IPABS, as well as any possible risks. By this review the author can argue that IPABS is characterized by small product scale, short term and high debt rating. The underlying assets are not intellectual property rights, but derivative rights. The products rely more on external credit enhancement as the asset dispersion is not ideal and the cash flow coverage is small. From the bottom assets side, this thesis found that the cash flow derives from the license fee, attached with strong guarantees. The dilemma of IPABS comes from many conditions such as unclear ownership of the intellectual property, the inability to realize "true sale" in assets transfer, unpredictable cash flow, diseconomy of scale in product issuance, uncontrollable legal risk and so on. It is thus concluded that the dilemma of IPABS comes from the intellectual property itself, and its essence is the "future claim" attribute of license right. The purpose of double SPV is to transfer risks so as to achieve "compliance". The reconstruction of the underlying assets can realize the replicability and popularization of IPABS.

In summary, the evidence is consistent across the four perspectives of this thesis. It is found that companies with large scale and low risk tend to securitization, and the ABS

market does not welcome enterprises with small scale and high risk. The empirical analysis of 35 commercial banks in China shows that the motivation of asset securitization is to release capital, improve liquidity and improve performance; the empirical analysis of 3,444 non-financial enterprises in Shanghai and Shenzhen stock exchanges shows that the motivation of ABS is to solve financing and reduce the asset liability ratio. The key link of ABS is “true sale” and “compliance” of underlying assets. The case of the KaiDi event has set a benchmark for “true sale” standard in China. The analysis of four IPABS products shows that the double SPV structure can help the underlying assets to disperse risks and achieve compliance requirements, but lengthen the transaction chain and increase transaction costs.

Taken together, as a structural innovation financial tool, asset securitization can help enterprises realize asset light, "revitalize the stock" and improve liquidity. This corporate feature is highly expected by China's supply-side structural reform market. However, in the statistical test of commercial banks and financial markets, the role of ABS is not significant. The possible explanation of this situation is that the development of the asset securitization market is still in its infancy, and its scale is small thus has a limited effect on China's financial reform.

Relative to the findings above, the thesis moves forward some recommendations. First of all, the legal level of SPV needs to be improved to ensure the implementation effect of "true sale". Second, the information disclosure of underlying assets needs to be transparent to ensure fair pricing. Third, the cash flow forecast of the underlying assets

needs to be solid to prevent the occurrence of any default events. Fourth, the No.23 Accounting Standards for Business Enterprises - Transfer of Financial Assets, should issue a unified operation guide, so as to standardize the judgment of the off-balance sheet. Fifth, the accuracy of credit rating of the ABS market should be improved, so as to remove the government implicit guarantee. Sixth, Internet platforms and block-chain technologies are introduced to ensure the authenticity and traceability of the underlying assets.

The future research directions are as follows

At the theoretical level

First, studies on the impact of credit rating decline on the maturity of ABS products is required. Second, studies on the impact of the public offering REITs on the off-balance sheet and tax planning is to be reviewed. Third, a study that answered the following question should be answered; within the transmission process of government structural monetary policy, can ABS as a structural financial tool help to achieve the policy effect of "precise drip irrigation"?

At the operational level

First, a study on the carbon neutral ABS and that pays attention to how the structured financial instruments structurally supports the national key projects has been conclusively carried out.

Second, research on the infrastructure REITs is required. The debt risk of China's local government financing platform comes from the long-term and low return of

infrastructure. It should be the future mission of China's asset securitization to resolve the financial risk of local debt by the public offering REITs.

Third, study on the supply-chain financing of ABS should also be carried out Trade finance based on core enterprises has accumulated a large number of commercial papers ABS can improve the liquidity of these commercial papers, which is conducive to the orientation and accuracy of financial services for small- and medium-scale enterprises.

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Appendix

1. Calculation of the Distance-to-Default (DtD)

In line with Merton (1974), the market value of a bank's equity capital can be modeled as a contingent claim on the residual value of its assets. Therefore, in case a bank defaults, the bank's shareholders receive no compensation for their investment if the market value of the bank's assets falls below the market value of the bank's liabilities. In contrast, if the market value of the bank's assets exceeds the market value of liabilities, the bank's shareholders obtain the difference between the market value of assets and liabilities. Consequently, the contingent claim on the residual value of a bank's assets can be modeled as a call option on the underlying bank using standard option-pricing models.

The distance from the default point (VA = DB) can be expressed as follows:

$$D = \ln V_A^T - \ln DB = \ln V_A + (\mu - \frac{1}{2}\sigma_A^2)T + \sigma_A\sqrt{T}\varepsilon - \ln DB \quad (1)$$

the DtD is designed to indicate the number of standard deviations that the bank is split from the default point within a given time horizon. The unobservable parameters V_A and σ_A can be calculated from the observable market value of equity capital (V_E) as well as the standard deviation of share price returns (σ_E) using Ito's lemma.

$$\text{DtD} \equiv \frac{D}{\sigma_A\sqrt{T}} - \varepsilon = \frac{\ln\left(\frac{V_A}{D_B}\right) + \left(\mu - \frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}} \quad (2)$$

$$V_E = V_A N(d_1) - DBe^{-rT}N(d_2) \quad (3)$$

$$\sigma_E = N(d_1)\frac{V_A}{V_E}\sigma_A$$

$$d_1 \equiv \frac{\ln\left(\frac{V_A}{D_B}\right)+\left(\mu+\frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}} = \frac{\ln\left(V_A \exp\left(\left(\mu+\frac{1}{2}\sigma_A^2\right)T\right)\right)-lnDB}{\sigma_A\sqrt{T}}, \quad (4)$$

$$d_2 \equiv d_1 - \sigma_A\sqrt{T} = \frac{\ln\left(\frac{V_A}{D_B}\right)+\left(\mu-\frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}} = \frac{\ln\left(V_A \exp\left(\left(\mu-\frac{1}{2}\sigma_A^2\right)T\right)\right)-lnDB}{\sigma_A\sqrt{T}} \quad (5)$$

2. Calculation of the Z-score

This work uses a modified version of the Z-score that builds upon the work of Altman (2000), and is calculated as follows:

$$Z_{i,t} \equiv \frac{\mu_{i,t} - X_{i,t}}{\sigma_{i,t}} \quad (6)$$

We calculate the Z-score for each bank i in each single year t where μ is the return on average assets before taxes (ROAA); X is a bank's equity capital as a percent of total assets and σ equals the standard deviation of the ROAA. A lower Z-score indicates a higher probability of insolvency risk and vice versa.