Asset Securitization for small and Medium-sized Real Estate Enterprises in China

WANG Shuangzhi

Doctor of Management

Supervisors:
PhD Rogério Serrasqueiro, Associate Professor,
ISCTE University Institute of Lisbon
PhD LI Qiang, Full Professor,
University of Electronic Science and Technology of China

May, 2022

iscte

Marketing, Operations and General Management Department

Asset Securitization for small and Medium-sized Real Estate Enterprises in China

WANG Shuangzhi

Doctor of Management

Supervisors:
PhD Rogério Serrasqueiro, Associate Professor,
ISCTE University Institute of Lisbon
PhD LI Qiang, Full Professor,
University of Electronic Science and Technology of China

May, 2022

Marketing, Operations and General Management Department

Asset Securitization for small and Medium-sized Real Estate Enterprises in China

WANG Shuangzhi

Doctor of Management

Jury:
PhD Henrique Manuel Caetano Duarte, Associate Professor with Habilitation,
ISCTE University Institute of Lisbon
PhD Domingos José da Silva Ferreira, Researcher,
NOVA Institute of Communication - Universidade Nova de Lisboa (ICNOVA)
PhD Xiao Wen, Full Professor,
University of Electronic Science and Technology of China
PhD Pedro Manuel de Sousa Leite Inácio, Retired Assistant Professor,
ISCTE University Institute of Lisbon
PhD Rogério Marques Serrasqueiro, Retired Assistant Professor,
ISCTE University Institute of Lisbon

May, 2022

Declaration

I declare that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university and that to the best of my knowledge it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed: 王双智 *Wang Shuangzhi*   Date: 2022.5.5

Name: WANG Shuangzhi

作者申明

本人郑重申明：除了论文致谢中明确说明并致以谢意的部分外，所呈交的论文不包含任何他人或作者本人已用于获得任何教育机构的学位和证书而使用过的材料。同时尽我所知，除了文中特别加以标注引用的内容外，本论文不包含任何其他个人或集体已经发表或撰写的成果作品。

作者签名：王双智 *Wang Shuangzhi*   日期：2022.5.5

姓名(拼音)：WANG Shuangzhi

[This page is deliberately left blank.]

Abstract

Based on the economic background of strict regulation and control of real estate bank credit and on the background of vigorous development of the financial system of direct financing in China, this thesis analyzes the necessity and feasibility of asset securitization financing for small and medium-sized real estate companies. It shows that this type of financing is not only in line with the direction of the dual economic and financial reforms, but also that small and medium-sized real estate companies can meet their financing needs by relying on their specific high-quality assets rather than the main body credit financing.

Using Company A as a typical case, we carried out design of the securitization program for the underlying asset pool construction, choice of bankruptcy remote and credit enhancement instruments, and product tranches, based on the characteristics of the asset composition status and low credit rating of the main body. Not only does it meet financing needs, but it also improves other financial situations. Therefore, this thesis has reference value, promotion, and practical significance for small and medium-sized real estate companies.

Keywords: Direct Finance; Asset Securitization; Small and Medium-sized Real Estate Enterprises
JEL: M41; G32

[This page is deliberately left blank.]

Resumo

Este trabalho analisa a necessidade e a viabilidade do financiamento de pequenas e médias empresas imobiliárias por via da securitização de ativos, no contexto económico da rigorosa regulamentação do crédito imobiliário e do vigoroso desenvolvimento do sistema de financiamento direto na China. Demonstra-se que este tipo de financiamento não só está de acordo com a direção da dupla reforma no âmbito da economia e das finanças, mas também que as pequenas e médias empresas do setor imobiliário podem satisfazer as suas necessidades de financiamento por via dos seus ativos específicos de alta qualidade como alternativa ao crédito por financiamento bancário.

Utilizando a empresa A como um caso típico, elaborou-se o desenho do programa de securitização para uma pool de ativos subjacentes, a seleção de instrumentos de isolamento de insolvência e de melhoria do nível do crédito, e o desenho do programa de securitização com tranches de produtos, com base nas características dos ativos e na avaliação de crédito da estrutura principal. Isto não só satisfez as necessidades de financiamento, como também melhorou outras condições financeiras. Por conseguinte, este trabalho tem valor de demonstração, de divulgação e significado prático para as pequenas e médias empresas imobiliárias chinesas.

Palavras-chave: financiamento direto; securitização de ativos; pequenas e médias empresas imobiliárias
JEL: M41; G32

[This page is deliberately left blank.]

摘要

本文在中国严格调控房地产银行信贷的经济背景，以及大力发展直接融资的金融体制背景下，分析了中小地产企业资产证券化融资的必要性和可性。显示出这种融资方式不仅符合经济和金融双重改革方向，而且中小地产企业依靠其特定的优质资产而非主体信用融资，可以满足其融资需求。

以 A 公司作为典型案例，结合其资产构成状况和主体信用等级低的特点，进行了基础资产池的构建、破产隔离与信用增级手段的选择、产品分层的证券化方案设计。不仅满足了融资需求，而且改善了其他财务状况。因此，本文对中小地产企业具有参考价值、推广性和现实意义。

关键词：直接融资；资产证券化；中小房地产企业
JEL: M41; G32

[This page is deliberately left blank.]

Acknowledgements

The five years of my PhD have been a very precious period of growth in my life. There have been twists and turns in these five years of study, but more progress; there have been difficulties, but more the joy of clarity when problems are solved. Throughout the course of my studies I have gained a greater appreciation of the depth of the management and finance disciplines, while at the same time improving my knowledge and practical skills. I would like to express my sincere gratitude to all the teachers who have taught me, and to my family, students and friends who have supported me.

First of all, I would like to sincerely thank my two supervisors, Professor Rogério Serrasqueiro and Professor Li Qiang.

Professor Rogério Serrasqueiro gave me a lot of guidance and help in my thesis writing, argument refinement, thesis structure sorting, methodology, and defense. In the process, Professor Rogério Serrasqueiro commented on the formatting of my thesis and the details of the translation, word by word, and revised it. His careful guidance and patient assistance with my thesis not only benefited me greatly, but also gave me a deep sense of his rigorous scholarship and profound knowledge.

Professor Li Qiang gave a lot of time and effort in supervising my thesis. He not only gave guidance on the selection of the thesis topic, the structure of the thesis, the revision of the thesis and the finalization of the thesis, but also gave professional and detailed guidance on the various details of the thesis writing. Professor Li Qiang's rigorous research attitude, profound knowledge, exemplary behavior as a teacher, and high level of professionalism have profoundly influenced me throughout the process of leading me to complete this thesis and have benefited me for the rest of my life!

Secondly, I would like to thank Professor Xiao Wen for her continuous support and assistance. Her support and encouragement have given me confidence!

Finally, thank you to my family who have always accompanied, encouraged and supported me wholeheartedly! You will always be a source of motivation for me!

[This page is deliberately left blank.]

致谢

攻读博士的五年，是我人生非常宝贵的一段成长历程。这五年的学习生活中有曲折，但更多的是进步；有困难，但更多的是问题被解决之后豁然开朗的喜悦。在整个学习过程中让我更体会到管理学和金融学学科的博大精深的同时，也使自己的知识水平和实践能力有了很大提高。在此我向所有为我传道受业解惑的老师们，给予我支持帮助的家人、同学和朋友们，致以最真挚的感谢！

特别的，我首先要诚挚的感谢我的两位导师，Rogério Serrasqueiro 教授和李强教授。

Rogério Serrasqueiro 教授在论文的写作、论点的提炼、论文结构整理、方法论、答辩等方面给了我很多指导和帮助。并且在这个过程中，Rogério Serrasqueiro 教授对我论文格式、翻译的细节进行了逐字逐句的批注和修改。他对我的论文细致的指导和耐心的帮助不但让我受益匪浅，而且也让我深深的感受到他严谨的学术态度和渊博的知识。

李强教授在指导我的论文过程中付出了大量的时间和精力。他不仅在论文选题、论文结构、论文修改和论文定稿等这些关键节点上给予指导意见，而且对于论文撰写中的各个细节部分也给予专业和细致的指导。李强教授在带领我完成这篇论文的整个过程中，他严谨的研究态度、渊博的知识、为人师表以身作则的风范、以及高度的敬业精神深刻的影响着我，使我受益终生！

其次，感谢肖文教授一直以来对我的大力支持和帮助。她的支持和鼓励给了我信心！

最后，感谢一直陪伴、鼓励和全心全意支持我的家人们！你们永远是我奋进的动力源泉！

[This page is deliberately left blank.]

Contents

[This page is deliberately left blank.]

List of Tables

[This page is deliberately left blank.]

List of Figures

[This page is deliberately left blank.]

xviii

Chapter 1: Introduction

1.1 Research background

The past forty years has witnessed the rapid development of national economy since the implementation of reform and opening-up policy in China. The real estate industry used to be the pillar industry that drove the national economic growth. However, the government has been strictly regulating the real estate industry since 2016 so as to get rid of the deep dependence of economic growth on the real estate industry. The regulation of the real estate market has been gradually strengthened in the current context of financial system reform of vigorously developing direct finance and deleveraging in China, and the financing environment and financing channels for real estate enterprises have been tightened. The large real estate enterprises are confronted with the challenge of financing, while small and medium-sized real estate enterprises with the risk of bankruptcy with broken cash flow. Therefore, whether small and medium-sized real estate enterprises can find new financing channels has become an urgent and critical issue. The asset securitization could enable small and medium-sized real estate enterprises to realize heavy asset financing, which thus leads small and medium-sized real estate enterprises to solve the financing problem.

The monetization of housing distribution system was implemented in China in 1998, which gave rise to the rapid development of the real estate market. As is shown in Figure 1.1, the sales area of commodity housing nationwide rose from 133,80.58 square meters in 1998 to 176,086 square meters in 2020 with the increase of 13.51 times and the multiple increase rate of 13.51%. The sales of commodity housing increased from CNY 274.55 billion in 1999 to CNY 17,361.3 billion in 2020 with the increase of 63.23 times and the compound growth rate of 21.83% (The People's Bank of China [PBOC], 2020). However, the housing price is undergoing a repeated up-and-down process while the sales and sales area continue to rise. The GDP growth rate in China has also changed from the trend of continuous growth before 2008 to a trend of continuous slowdown afterwards. In retrospect,2008 the GDP growth rate maintained rapid and steady growth before 2008 while the real estate industry also achieved rapid development. But the emergence of the international financial crisis in 2008 caused the GDP economic growth rate in China to slip directly from 14.23% in 2008 to 9.65% in 2009 and continue to slow down.

Confronted with the situation, the public policy in China chose to launch an economic stimulus package of CNY 4 trillion in 2009 and to implement a massive expansionary monetary policy from 2014 to 2016, which were expected to stimulate the growth of the real estate market so as to drive the Chinese economy to a stable growth (X. Q. E. Xu & Chen, 2012). However, the M1 growth rate has been higher than the M2 growth rate since 2000, which indicates that the excess money flowing only into the asset sector instead of the real economy led to the capital being distracted from its intended purpose. During this period, the trend of real estate market expansion did not change although some suppressive policies were introduced for the real estate market.
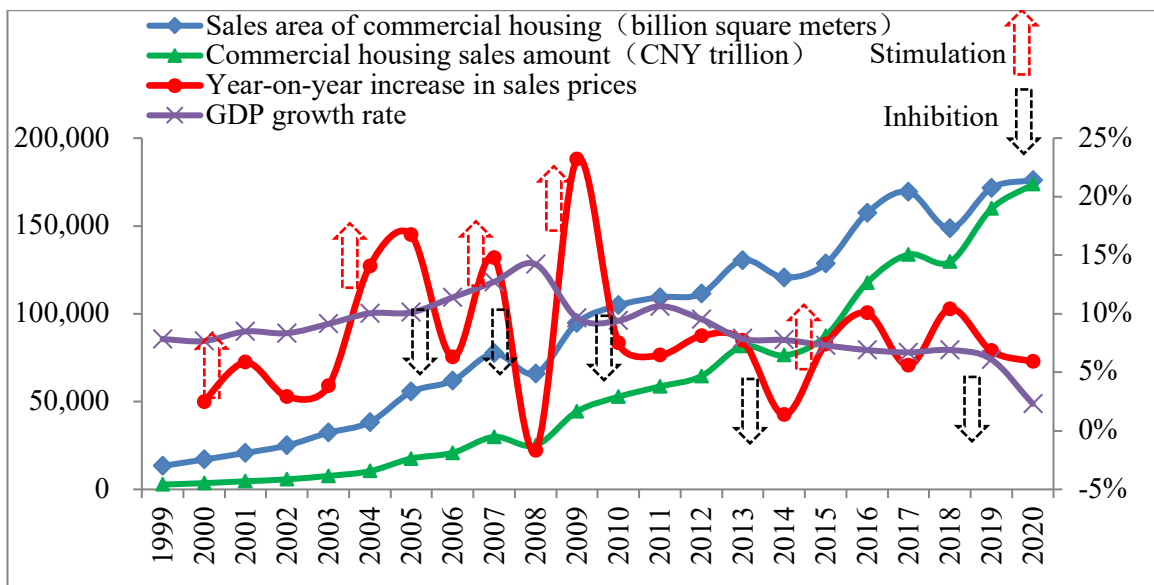
Figure 1.1 The national commercial housing sales area, sales amount and the year-on-year growth rate of commercial housing prices（1999 - 2018）

Considering that the real estate market is closely related to macroeconomic factors (Poterba et al., 1991 ; Quigley, 1999 ; Case & Shiller, 2003 ; Y. J. Li, 2011) the stimulus policy made the real estate market temporarily boost economic growth while it also caused a series of negative consequences, including soaring housing price, sharply increased size of loans in the real estate market, declining real economy, rising leverage ratio and increasing systemic financial risks. The most prominent aspects are the surge in housing price and the sharp increase in the size of loans in the real estate market.

In terms of the housing price, the average price of commercial housing nationwide was less than CNY 2,000 per square meter in 1998, which increased significantly across the country by 2017 with the housing price to income ratio of residents expanding remarkably as well. As is shown in the appendix 1.1, the statistics of housing price, per capita disposable income and housing price to income ratio for 35 representative large and medium-sized cities in the first,

second and third tier cities in 2017 reveal that the size of the resident population in 35 cities was 334 million accounting for about 24% of the total population of the country (National Bureau of Statistics [NBS], 2017). The housing price to income ratio was as high as 39.72 times in Shenzhen, while the minimum ratio was 6.73 times in Changsha. Moreover, the housing price to income ratios of 23 cities exceeded 10 (Fan & Wang, 2016). According to international practice, the housing price to income ratio between three and six times is the reasonable range (Yang, 2003). In contrast, the housing price to income ratios in China are at an unusually high level. Due to the soaring housing price, many scholars have empirically tested the possibility of the bubble in housing price and its inducing systemic financial risks (B. L. Zhang & Pan, 2013 ; X. G. Wang, 2017).

In terms of the scale of loans in the real estate market, the financial institutions loan investment statistics report in 2020 showed that the balance of loans in the real estate market in China was CNY 49.58 trillion by the end of 2020, among which the real estate development loans is CNY 11.91 trillion while personal housing loans CNY 34.44 trillion In comparison, the total market capitalization of Shanghai and Shenzhen stock markets in China is CNY 79.72 trillion, and the total size of China's bond market is CNY 116.72 trillion (PBOC, 2020b). Therefore, the scale of loans in China's real estate market is second only to the stock market and the bond market. The real estate market is inextricably linked to the stock and bond markets, which means that the stability of the real estate financial market directly affects the stability of China's financial market.

Given that both Japan and the United States have witnessed huge economic crises caused by the real estate market (H. Liu, 2013), the Chinese government attaches great importance to the systemic financial risks that may arise from the real estate market when confronted with the housing price bubble and the excessive size of loans in the real estate market. President Xi Jinping has proposed and emphasized in several meetings and reports from 2016 to 2017 that housing for living instead of speculation, curbing the real estate bubble, holding the bottom line of no systemic financial risk, increasing the proportion of direct financing and promoting the securitization of assets (Central Committee of the Communist Party of China, 2017). In order to break away from the long-term heavy reliance on the real estate market for economic growth, the country has proposed a strategy to transform and upgrade its economic structure (The State Council of the People's Republic of China, 2017). In this context, the common financing channels for real estate enterprises, including bank loans, bonds, and pledge of stock rights, have been strictly restricted one after another. The trusts, private equity funds and other non-standardized financing channels are directly banned. A new round of comprehensive regulation

of the real estate market has started, and it is inevitable to conduct deleverage and destocking the real estate field as well as to further tighten the financing environment and financing channels for real estate enterprises.

To cope with the pressure on cash flow of small and medium-sized real estate enterprises caused by the continuous tightening of the financing environment and financing channels, as well as with their own development needs, small and medium-sized real estate enterprises urgently need to change the traditional financing channels. It has become urgent to review and identify viable financing channels. As is shown in Annexes 1.2, the small and medium-sized real estate enterprises in China mainly have ten financing channels.

It is important to note in particular that the financing channels for small and medium-sized real estate enterprises in China may seem diverse, but this is not the case for them. Specifically, indirect financing has long been the traditional financing channel that real estate enterprises have relied on most. However, this type of financing has now been severely restricted by various policies. Direct financing is mainly based on IPO, but the close connection between real estate market and financial markets may lead to systemic financial risks. Thus, the Chinese government stopped real estate IPO in 2010. The asset securitization enables real estate enterprises to transform assets which are illiquid but able to generate stable cash flow in the future into securitized products that can be traded and circulated in the capital market through structured restructuring. Therefore, asset securitization is in line with not only the policy background of strict regulation and control of real estate under the prevention and control of systemic financial risks in China, but also the policy guidance of vigorously developing direct financing in the context of deepening financial system reform. It shows that asset securitization is a necessary and feasible financing method for small and medium-sized real estate enterprises in China at this stage (Ba & Niu, 2013).

1.2 Research problem and key concepts

1.2.1   Research problem and research question

The research problem is: Against the background of increasingly strict regulatory policies in the real estate industry, the task of "deleveraging" real estate enterprises is extremely arduous. Fortunately, the reform direction of China's financial system in recent years is to vigorously increase the proportion of direct financing and develop multi-level capital markets, which provides the possibility for real estate enterprises to explore new financing channels. However,

unlike large real estate enterprises that can raise funds through SEO (seasoned equity offering), REITS issuance and spin-off listing, small and medium-sized real estate enterprises are usually characterized by low credit ratings, relatively weak supply chain positions, which leads to weak commercial credit financing ability, and less diversified asset composition. Therefore, the research problem of this thesis is to combine the micro characteristics of small and medium-sized real estate enterprises with the macro environment of the national financial system reform, to design a financing program for small and medium-sized real estate enterprises that is essentially direct financing, and to examine its effectiveness from several aspects.

The specific research questions include:

The continuity and stability of expected future cash flows are fundamental for enterprises to raise direct financing in the capital markets. For small and medium-sized real estate enterprises, asset securitization using specific assets with relatively stable expected cash flows is an effective financing program. For the securitization financing of small and medium-sized real estate enterprises, the question of this thesis includes two:

First, How to propose a direct financing channel for small and medium-sized real estate companies in line with the direction of dual economic and financial reforms, based on the economic background of strict regulation and control of the real estate industry and the background of vigorous development of the financial system of direct financing in China, through an analysis of the necessity and feasibility of securitization financing for small and medium-sized companies？

Second, how to design a securitization program including underlying asset pool construction, choice of bankruptcy remote and credit enhancement means, and product tranches based on the asset composition status of small and medium-sized real estate companies and the low credit rating characteristics of the subject, through typical case studies?

1.2.2 Definition of important concepts

The important concepts involved in this thesis are defined as following:

(1) Direct finance is a method of financing where borrowers borrow funds directly from the financial market without using a third party service, such as a financial intermediary. Direct financing is usually done by borrowers that sell securities and/or shares to raise money and circumvent the high interest rate of financial intermediary (banks) (Mishkin, 2012).

(2) Asset securitization is used to refer to so-called "structured finance," the process by which (relatively) homogeneous, but illiquid, assets are pooled and repackaged, with security

interests representing claims to the incoming cash flows and other economic benefits generated by the loan pool sold as securities to third-party investors (Lumpkin, 1999).

(3) Small and medium-sized real estate enterprises refer to economic organizations that engage in real estate development, operation, management, and service activities, and operate independently with independent accountability for the purpose of making profits, with Operating revenue of less than CNY 2 billion or their total assets of less than CNY 100 million (Ministry of Industry and Information Technology, 2011).

1.3 Research significance

1.3.1   Theoretical significance

The theoretical significance of this thesis include:

(1) Based on the two major policy environments of strict regulation and control of real estate and development of capital market in China, theoretically explore the mechanism of action of asset securitization for resolving real estate risks and promoting sustainable development of real estate finance.

(2) There have been researches on asset securitization of real estate enterprises, and the research objects are mainly large real estate enterprises, and the discussion of securitization schemes are mainly for REITs or securitization of accounts receivable, and others. However, small and medium-sized enterprises are not only unable to issue REITs due to the low credit rating of the subject, but also have difficulty in having stable commercial credit assets due to their relatively weak supply chain positions. Taking Company A, a small and medium-sized real estate enterprise, as a case study, this thesis discusses the underlying asset pool construction and the selection of credit enhancement means, the selection of bankruptcy remote means, and the tranches designs of asset securitization for small and medium-sized real estate enterprises, using detailed and real industry data and unique corporate data, which enriches and expands the research scope of asset securitization.

1.3.2   Practical significance

The practical significance of this thesis include:

(1) From a macro perspective, asset securitization as an alternative tool to bank financing could play a greater role in financing when bank loan financing is restricted. Moreover, asset securitization can improve the efficiency of China's financial market, reduce financial risks,

promote the reform of the investment and financing system, and help change the financing structure from the previous indirect financing to direct financing. It is in line with the current financial system reform background of vigorously developing direct finance and deleveraging in China.

(2) From the perspective of industry, with the adjustment of national policies on the real estate industry, it is confronted with the situation that the financing environment and financing channels continue to be tightened. Through the implementation of real estate asset securitization, it can revitalize the stock assets and change the status quo of real estate industry which relies heavily on bank loans and debt market financing. Moreover, it contributes to broadening the financing channels of the real estate industry and solving the problems of large capital demand and poor financing channels. Therefore, the promotion of the securitization of real estate assets is of great significance to reduce financial risks and stimulate the structural reform on the supply side of real estate.

(3) From the micro aspect, many real estate enterprises are facing the dilemma of increasingly difficult financing, fewer financing channels and higher financing costs. Especially for small and medium-sized real estate enterprises, the problem is likely to cause the risk of capital chain breakage in the future. The stable cash flow does not mean valuable assets, while valuable assets do not mean it can generate stable cash flow. The real estate asset securitization breaks through the dilemma of traditional bank credit financing focusing on subject credit. It is necessary and feasible for small and medium-sized real estate enterprises to rely on the cash flow generated by valuable and high-quality underlying assets as repayment support and to resort to structured restructuring for credit enhancement. On the one hand, the real estate asset securitization enables small and medium-sized real estate enterprises to broaden financing channels and solve the problem of difficult financing. On the other hand, it enhances the liquidity of cash and improves the utilization rate of capital.

1.4 Research content and framework

This thesis comprises six chapters as followings.

Chapter 1 is the introduction. It introduces the background of the selected topic, the research objectives, the theoretical and practical significance of the research, the research questions, and the technical route of the research.

Chapter 2 is the theoretical foundation and literature review. The theories involving small and medium-sized real estate enterprises and asset securitization as well as domestic and foreign

research literature are systematically studied and reviewed, which lays the foundation of theoretical analysis of the whole thesis.

Chapter 3 is methodology. This chapter deduces and poses two research questions based on the literature review and the practical situation. Based on the two research questions, the "qualitative method" and the "case study method" adopted are presented separately.

Chapter 4 provides a specific and in-depth analysis of the necessity and feasibility of implementing asset securitization for small and medium-sized real estate companies through normative research and mathematical and statistical analysis.

Chapter 5 selects underlying assets with consistent, stable, and predictable cash flow based on the composition of the underlying assets of small and medium companies and the characteristics of the subject's low credit rating. Cash flow forecasting and analysis of the underlying asset pool by constructing a financial planning model based on the fixed-ratio growth method. And the choice of bankruptcy remote, credit enhancement, and tranches design under different characteristics differences to theoretically derive a quantitative and comprehensive program for asset securitization and its implementation effects.

Chapter 6 presents the conclusions and contributions of the entire text. The conclusions and contributions of the full text of the study are summarized. It concludes with relevant recommendations on the insights and limitations of asset securitization programs for small and medium-sized real estate companies in China.

The technical approach followed in this thesis is presented in Figure 1.2.

```
┌─────────────────────────────────────────┐
│     Background and problems raising       │        Background and
│              (Chapter 1)                  │          problems
└─────────────────────────────────────────┘
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
┌──────────────────────────┐   ┌──────────────────────────┐
│ Fundamental principles,   │   │       Methodology          │   Literature review
│ types and related research│   │       (Chapter 3)          │   and methodology
│ of real estate asset      │   │                            │
│ securitization (Chapter 2)│   │                            │
└──────────────────────────┘   └──────────────────────────┘
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
┌──────────────────────────┐   ┌──────────────────────────┐   Necessity
│ Necessity analysis of      │   │ Feasibility analysis of    │   and
│ implementing asset         │   │ implementing asset         │   feasibility
│ securitization for small   │   │ securitization for small   │   analysis
│ and medium-sized real      │   │ and medium-sized real      │
│ estate enterprises         │   │ estate enterprises         │
│ （Chapter 4）              │   │ （Chapter 4）              │
└──────────────────────────┘   └──────────────────────────┘
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
┌──────────────────────────────────────────────────────┐  Underlying asset
│ ┌────────────────────┐      ┌────────────────────┐   │  pool construction
│ │ Underlying asset    │ ───▶ │ Underlying asset    │   │  and cash flow
│ │ cash flow           │      │ pool construction   │   │  prediction
│ │ characteristics     │      │ and cash flow       │   │
│ │ analysis and        │      │ prediction          │   │
│ │ selection (Chapter5)│      │ (Chapter 5)         │   │
│ └────────────────────┘      └────────────────────┘   │
│           ▲                            │               │
│ ┌────────────────┐ ┌──────────────┐ ┌──────────────┐ │
│ │ Product layering│◀│ Credit Rating │◀│ Selection of │ │
│ │ and payment     │ │ and credit    │ │ bankruptcy   │ │
│ │ methods         │ │ enhancement   │ │ remote means │ │
│ │ （Chapter 5）   │ │ （Chapter 5） │ │ （Chapter 5）│ │
│ └────────────────┘ └──────────────┘ └──────────────┘ │
└──────────────────────────────────────────────────────┘
                        │                        Asset securitization
                        ▼                        program design and
┌──────────────────────────────────┐            effect
│ Program implementation effect      │
│ and potential risks (Chapter 5)    │
└──────────────────────────────────┘
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                        │
                        ▼
┌──────────────────────────────────┐
│ Conclusion and research            │            Conclusions
│ outlook (Chapter 6)                │
└──────────────────────────────────┘
```

Figure 1.2 Technical approach

[This page is deliberately left blank.]

[This page is deliberately left blank.]

Chapter 2: Literature Review

2.1 The background and basis of asset securitization

2.1.1   Basic concept of asset securitization

Asset securitization originated from Mortgage-Backed Securitization in the United States. There is a broad definition of asset securitization in the theoretical circle. Rosenthal and Ocampo (1988) present that asset securitization is essentially a fund-raising behavior mediated by securities. Gardener (1991) considers it as a financing process or a financial instrument that allows depositors and borrowers to match funds between them by using the financial market as an intermediary. Vinod (2006) presents it as a process of financial activity that transforms the relationship of money lending and borrowing by banks into the relationship of buying and selling financial products in financial markets. Fabozzi, a professor at Yale University in the United States, the "father of securitization," presents that securitization can be broadly defined as a process. Through this process, loans, consumer installment contracts, leases, receivables and other illiquid assets with common characteristics are packaged as marketable, investment-specific interest-paying securities (Fabozzi & Modigliani, 1996). According to Shenker and Colletta (1991), asset securitization refers to the sale of equity or creditor's rights that represents the ownership interest in an independent, cash-flow property or collection of property. Such transactions increase the liquidity of ownership interests or claims on such property. Therefore, based on the analysis of the above definitions, we can conclude that asset securitization is to replace bank credit with asset credit, which is different from the traditional bank credit financing model. These definitions emphasize liquidity, that is, asset-backed securities are assets that transform illiquid assets into liquid assets. The financing model can pool assets that are illiquid but have sustained and stable cash flow in the future and transform them into securities that can be sold and circulated in financial markets through structured restructuring, in order to finance funds.

2.1.2   Main types of asset securitization

The main types of asset securitization include:

    (1) The classification by types of underlying assets

    The foundation of asset securitization transaction is the underlying asset. This fundamental

role is reflected in the fact that the cash flow of asset securitization products comes entirely from the cash flow of underlying assets. Moreover, the composition and characteristics of the underlying assets have a significant impact on the composition and cash flow characteristics of the securitization transaction. According to the difference of underlying assets, asset securitization can be divided into Mortgage-Backed Securitization (MBS) and Asset-Backed securitization (ABS). The difference is that MBS's underlying assets are house mortgage loans (Fabozzi et al., 2011), ABS's underlying assets are assets other than house mortgage loans. Through the refinement of MBS products and ABS products, they can be divided into several asset securitization products, as shown in Figure 2.1.
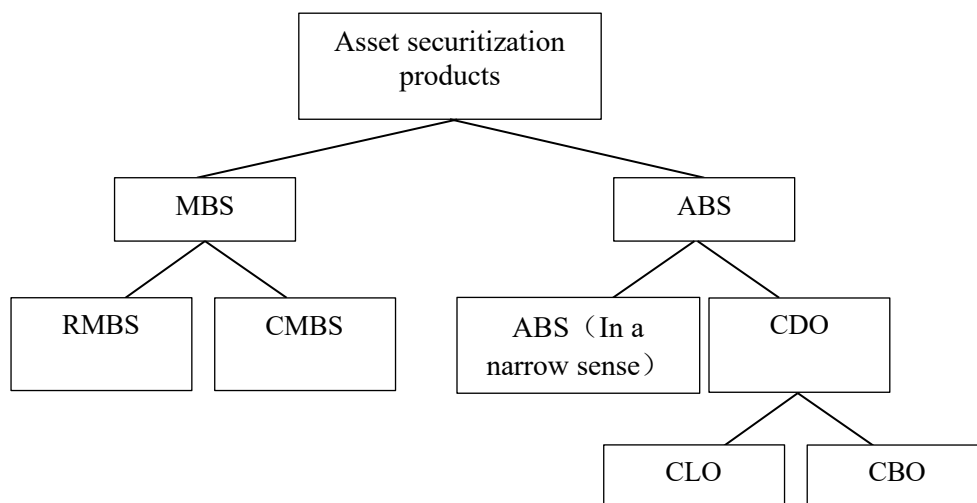
Figure 2.1 Classification map of asset securitization products

Source: Author finishing

Through the subdivision of MBS products, it can be divided into residential mortgage-backed securities (RMBS) and commercial real estate mortgage-backed securities (CMBS). The underlying assets of RMBS are mainly mortgage loans applied for by individual residents to purchase house. This kind of single loan is small and homogeneous in loan contracts. The underlying assets of CMBS are real estate mortgages that can generate rental income, such as commercial shopping centers, office buildings, hotels, rental apartments, the number of loans is small, but the scale of a single loan is relatively large. And there is a big difference in each loan contract.

Through the subdivision of ABS products, it can be divided into ABS in a narrow sense and CDO. The underlying assets of ABS in a narrow sense are mainly a kind of homogeneous assets, such as accounts receivables, fees, loans. Through the subdivision of CDO products, they can be divided into collateralized bond obligation (CBO) and collateralized loan obligation (CLO). CBO's underlying assets are a set of market-traded bonds. CLO's underlying assets are a group

of credit assets.

(2) Classification by types of structural reorganization

According to the classification of structural reorganization, the types of asset securitization are mainly divided into trust Special Purpose Trust (SPT) and company Special Purpose Company (SPC) (Xie, 2004).

SPT means it is established in the form of trust. According to the legal relationship of trust, through the "isolation" of SPT, the "medium" organization, the original owners no longer have a creditor's claim to the securitized underlying assets, to realize the bankruptcy remote between the underlying assets and the original owners.

SPC means it is established in the form of a company. The original owners, as the trustors, sell their own underlying assets to SPC, to enable SPC to substantially own the underlying assets in law. As a permanent establishment, SPC can buy different underlying assets from different sponsors and securitize one or a group of underlying assets in order or at the same time. Therefore, SPC can greatly expand the size of the underlying asset pool, and dilute transaction costs to improve the efficiency of securitization through continuous securitization transactions. Its key feature is that the cash income of the underlying assets is paid in the order of senior, mezzanine and secondary. This priority scheme makes each part show different default probabilities and different expected losses. As a result, the senior segment is almost safe, but the secondary segment bears the highest risk of default .

(3) Classification by modes of cash flow reorganization

According to the cash flow reorganization modes of underlying assets, the types of asset securitization can be divided into pass-through and pay-through. Pass-through securitization according to the actual return of the cash flow of the underlying assets, the product manager allocates all the funds in the account on the expected maturity date. Because the pass-through securitization does not re-segment the cash flow, the flow, term, and other risks of cash flow cannot be separated, which has great uncertainty for the repayment to investors. Generally, when the cash flow generated by underlying assets is stable, with a long term, and the assets are at low risk, pass-through securitization will be adopted.

Pay-through securitization means that the asset securitization product manager rearranges and allocates the cash flow of the underlying assets and designs different risk levels of asset securitization products whose risks are higher or lower than those of the underlying assets. All levels of asset securitization products have a fixed payment plan, and investors can obtain the agreed cash flow distribution at the agreed time. Due to the re-segmentation of cash flow by pay-through securitization, the flow, term and other risks of cash flow are also rearranged,

allowing for the design of various securitization products that meet the matching of risk to return and timing. Generally, when the cash flow generated by underlying assets is unstable, with a short term, and the assets are at high risk, and it is necessary to rearrange and allocate the cash flow to create a better rating, pay-through securitization will be adopted.

2.1.3   General framwork of asset securitization

Supported by asset credit, through the two processes of "construction" and "transformation", asset securitization repackages the cash flow, and applies complex investment banking technology (repackage the cash flow into the tradable securities) to transform illiquid assets into liquid capital financial products (Lawson, 2009). The process of "construction" is to reconfigure and combine predictable future cash flow allocations to create a pool of underlying assets. The process of "transformation" is to design the cash flows generated by the underlying assets through the cash flow segmentation technology, in which the cash flows are repaid in different sequences and with different rights.

To complete an asset securitization transaction, you need to include the following operation flow as shown in Figure 2.2.
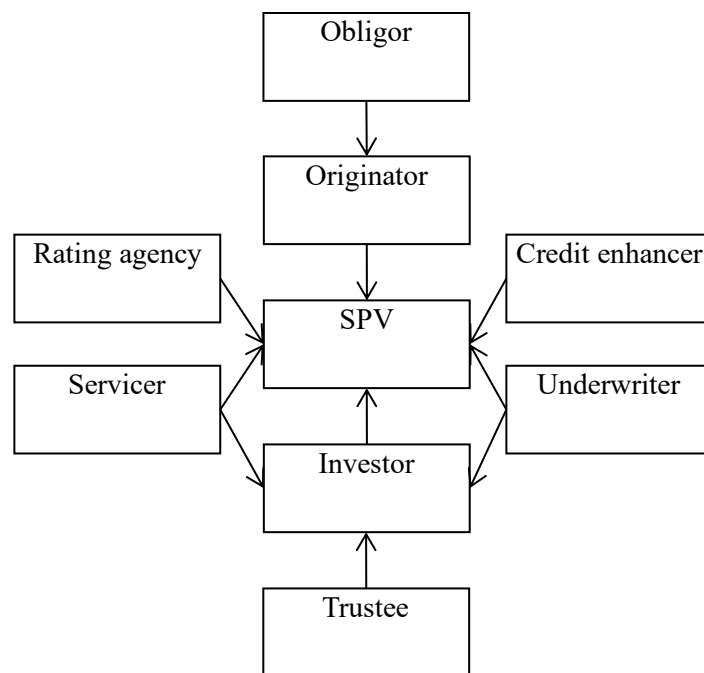
Figure 2.2 The operation process of asset securitization

Source: Author finishing

(1) Build the underlying asset pool and forecast the cash flow

Assets that can generate stable and predictable cash flow can be called underlying assets (Schwartz, 2012). Theoretically, all assets that can be securitized are assets with stable and

predictable cash flow. In fact, securitized assets are often illiquid assets, which are converted into highly liquid securities through securitization. Therefore, an important factor indispensable to asset securitization is cash flow. The core function of securitization is to discount future cash flow to today. The difficulty of asset securitization generally depends on the difficulty of forecasting the cash flow of underlying assets. The underlying assets that are easier to achieve asset securitization have the following basic characteristics:

Assets can generate stable and predictable cash inflows.

Assets are highly homogeneous.

Asset collateral is easy to be realized, and the realization value is high.

Assets are low default and loss rates.

The original owner of assets has a good credit record.

Therefore, the underlying assets with unstable cash flow, low homogeneity and poor credit quality are difficult to be securitized.

The originators of asset securitization, based on clarifying their own financing needs, select the underlying assets in line with the pool rules to form the pool of underlying assets, and transfer them to special purpose vehicle (SPV). This process of asset transfer is called "real sale", and its purpose is to achieve the "bankruptcy remote" mentioned above, that is, to minimize the risk of asset-backed securities.

Asset securitization is not securitization of underlying assets, but securitization of cash flow generated by underlying assets. The present value of expected cash flow in the future determines the value of underlying assets, which is the core and essence of asset securitization (Jobst, 2005). Underlying assets can produce stable and predictable cash flow is the premise and basis of asset securitization, underlying assets that cannot produce expected cash flow cannot carry out asset securitization. Only the underlying assets with stable and predictable cash flow can be evaluated and their securities value can be determined.

The rating agencies determine the credit rating by analyzing the certainty of the cash flow generated by the underlying assets. Because the cash flows and terms generated by different underlying assets are different in the future, it is determined that asset securitization products will have different principal, interest and maturity. Because the ability to take on debt is not determined by the absolute amount of debt (Seitz & Ellison, 2005), but by solvency, and tracking cash flow is the most reliable and revealing way to evaluate a company (Graham & Dodd, 2008). Therefore, it is the core principle of asset securitization to predict and analyze whether the cash flow of underlying assets can be provided on time as expected to ensure the ability to pay on a regular basis prudently and objectively. The prediction and analysis will help

to design asset securitization products that not only meet the characteristics of cash flow of underlying assets, but also meet the needs of investors.

(2) Structural reorganization of assets

The structural reorganization of assets is the key to asset securitization (Jobst, 2005). It is mainly reflected in two aspects: on the one hand, because asset securitization does not take the main credit of the enterprise as the guarantee, but pays more attention to the asset credit, it is necessary to "isolation" the underlying assets from the overall assets of the credit subject. and transferred to a special purpose vehicle for separate financing (Schwarcz, 2013).

Special purpose vehicle (SPV) is a special legal entity specially established for asset securitization. Iacobucci and Winter (2005) found that SPV is generally a company, trust or other entity. SPV provides funds for asset purchases by issuing debt securities or "equity securities with debt characteristics". Although asset securitization transactions vary in detail, the typical transaction process is that the sponsors sell assets to SPV, which in essence is to separate the future cash flow from the company. H. Y. Huang (2010) presents that asset securitization transfers the credit risk of the assets through SPV, thus achieving risk isolation and taking ownership of the assets.

Bankruptcy remote of the underlying assets through a real sale, which means that the securitized assets are taken off the balance sheet. Bankruptcy remote is achieved by " real sale " the underlying assets to SPV. There are many legal, accounting and tax issues involved in this process. The goal is that once the originators go bankrupt, because of the "bankruptcy remote" between the underlying assets and the originators, the creditors of the originators have no right of recourse against the transferred underlying assets. In essence, asset securitization is a financial activity centering on bankruptcy remote, a variety of structural designs designed to achieve bankruptcy remote, and through bankruptcy remote, the reorganization of risks and benefits is realized finally.

The bankruptcy remote of asset securitization is an important feature to distinguish other financing methods. Loans, stocks, bonds, and other financing methods are more dependent on the main body credit, and the risk and return of the voucher holders are linked with the overall risk of the enterprise. However, asset securitization is different. By setting up a special purpose vehicle (SPV), the original owners' underlying assets that meet the requirements of asset securitization are "stripped" from the overall assets of the main body and truly sold to the special purpose vehicle. Because the risk and return of assets are interconnected and closely intertwined, the risks are transmitted at the same time as the returns are transmitted in the operation and management of the assets.

From the legal level, bankruptcy remote separates the risks and interests of the underlying assets of an asset securitization from those of the underlying assets that have not been securitized, so that the insolvency risks of the non-securitized assets and their carriers cannot be transmitted to the securitized assets and their carriers. Therefore, bankruptcy remote can not only improve the efficiency of asset securitization, but also maximize the benefits of all parties involved in asset securitization transactions.

On the other hand, the selection of underlying assets is an important part of asset restructuring. By analyzing its own financing needs, the financing demander selects the underlying assets suitable for asset securitization, which can generate expected and stable cash flow, and uses the principle of asset reorganization to re-segment and combine the underlying assets to form the underlying asset pool (Fahad & Laura, 2017). Through the reorganization of underlying assets to realize the restructuring of income, asset securitization achieves the goal of optimization, equilibrium, and lowest cost. Finally, the cash flow of underlying assets is restructured, by means of priority and inferior classification, terms classification, total income swap and other means, to create multi-grade and multi-level securitized products with different risks, terms, benefits, and other characteristics.

According to different tranche schemes, different classes of securitization products also differ in terms of risk-taking, issue size, yield, and issue timing. Risk size is the main influencing variable in the tranche design, and the degree of risk is distinguished in the sequential order of allocation of cash flows from underlying assets, so how to stratify has an important impact on cash flow arrangements. Because of the inconsistent characteristics of the underlying assets themselves, there are many differences in the structural reorganization of the underlying assets, and the degree of difficulty in the asset securitization for various assets is also different.

At present, in the market practice of asset securitization transactions of real estate enterprises, unique asset-backed plans are usually used as the particular purpose vehicle for enterprise asset securitization. The transaction structure of asset securitization products of Chinese real estate enterprises is mainly "Fund Structure" and "Trust Structure." Although the transaction structure is different, the primary purpose is to realize the unique asset-backed plan to indirectly hold the target property assets by holding the equity or creditor's rights of the project company through a series of asset reorganizations, thereby realizing the "real sale and bankruptcy remote" of the assets.

"Fund structure" is an asset-backed securities product issued by the original owner who sells equity to issue fund shares, thereby pooling funds from many funds to subscribe investors

and repaying investors with the rent generated by real estate and the value of the real estate. "Trust structure" is mainly an asset-backed securities product issued by the original owner to obtain a trust loan through a mortgage of real estate ownership and to repay the principal and interest by relying on the cash flow generated by the mortgage in the future. The difference between the two transaction structures is shown in Annexes 2.2.

(3) Credit enhancement and credit rating

In order to better match the timing, amount and creditworthiness of securitization products to the needs of investors, as well as to meet the needs of issuers in terms of the amount of funding, institutional and policy regulation, accounting reporting, it is often necessary to upgrade the credit rating of securitized products by a rating agency during the securitization process (Partnoy, 2009). The purpose of the issuance rating is to announce the final rating to investors.

The higher the credit rating, the lower the risk and cost of securities, and vice versa. In order to achieve the goal of attracting investment and reducing the cost of financing during the issuance process, issuers are required to fully credit enhance their asset securitization products, thereby meeting the amount and timing of cash flows that match the needs of investors, as well as meeting the needs of issuers in terms of the amount of funding, institutional and policy regulation, and accounting reporting. By introducing additional credit through credit enhancement, not only the overall risk of asset securitization products can be dispersed, but also the risk of investors can be dispersed, so as to improve the credit level of asset securitization products (Richard & Stanislas, 2000).

The practice of asset securitization shows that the products of asset securitization all contain some form of credit enhancement. The asset restructuring and bankruptcy remote mentioned above also include credit enhancement in a sense. The credit enhancement of asset securitization can not only make investors not bear liquidity risk, but also reduce the cost of securities issuers. That is, when the cash flow of the underlying assets fails to reach the predetermined target amount in the expected period, the securities issuer needs to compensate for the risk, which will undoubtedly increase the issuance cost of the securities issuer. However, if the credit and liquidity support are improved through credit enhancement, the issuance cost can be reduced.

Credit enhancement mechanisms are usually divided into internal and external credit enhancement depending on the source of credit support. Internal credit enhancement refers to credit enhancement measures that rely on the underlying assets themselves or are constructed through asset restructuring. External credit enhancement refers to credit enhancement measures

provided by a third party other than the SPV. Different credit enhancement instruments are different in scope, structure, and risk targeting. At present, it is a standard credit enhancement method used in asset securitization transactions of Chinese real estate enterprises. Combined with different underlying asset endowments and selection conditions, choosing different credit enhancement methods is necessary to act on different transaction structures. As shown in Figure 2.3:

Internal Credit   External Credit Enhancement Method

7. Securities Liquidity Support Commitment

12. Repurchase

6. Shortfall Make-up Commitment and Guarantee

10. Guarantee

8. Equity Pledge

9. Accounts Receivable Pledge

11. Financial Support Commitment

4. Credit Trigger Mechanism

1. Senior/Subordinated Tranches

2. Risk Reserve

5. Property Assets Mortgage

3. Excess Cash Flow Coverage

Senior Tranche Investor — Subordinated Tranche Investor — Asset-backed Special Plan — Hosting Account — Private Equity/Trust — Custody Account — Project Company — Underlying Assets

Figure 2.3 Node diagram of credit enhancement means for real estate enterprises

Source: Author finishing

Internal credit enhancement methods include:

Senior-Subordinated Structure. It refers to establishing a transaction structure with senior and subordinated tranches in the payment of principal and interest or distribution of losses on the asset-backed securities side. Risk redistribution is achieved by using subordinated tranches securities as credit backing for senior tranches securities. The senior-subordinated tranches repayment order is the most critical and direct internal credit enhancement mechanism.

Risk Reserve. It refers to the particular purpose vehicle withdrawing a certain percentage of the funds raised from the issued asset-backed bonds or depositing it into the reserve account from the inflow of external funds. If the cash flow of the underlying assets cannot cover the interest or expenses of the same period, the risk reserve will make up the difference.

Over Cash Flow Coverage. It refers to the cash flow generated by the underlying assets is greater than the principal, interest and expenses expected to be paid by the asset-backed securities. This provides a capital buffer to a certain extent and avoids the risk of default.

Credit Trigger Mechanism. It refers to when a credit event (accelerated settlement event, default event) occurs in the redemption of asset-backed securities. The distribution sequence of the cash flow of the underlying assets is rearranged according to the stipulations in the transaction documents to strengthen the income guarantee for the senior tranche securities.

Over collateralization. It refers to the project company providing a mortgage guarantee with the underlying assets, and when there is a default in payment, it can reserve the right to apply for enforcement of the underlying assets.

External credit enhancement method include:

Shortfall payment commitments. The difference payment promiser undertakes to the manager of the unique asset-backed plan that the cash flow generated by the underlying assets of the particular plan cannot or cannot be paid in sequence for the principal and expected income of the senior tranche asset-backed securities. Guarantee is a warranty provided to the administrator of the particular asset-backed plan, and a further guaranteed measure for the commitment to pay the difference.

External liquidity support. It refers to the agreement that the original owner or related party, as the securities liquidity support institution, agrees to purchase all the securities for transfer that cannot be traded on the registration date and provide the necessary liquidity for securities trading and investor withdrawal.

Equity Pledge and Accounts Receivable Pledge. It refers to the equity and accounts receivable of the asset owner's company to guarantee the debts undertaken by way of pledge.

Third-party guaranties. It refers to the warranty provided by the original owner or related parties for the repayment of the loan debt of the project company.

Financial Support Commitment. It refers to the commitment by the original owner or related party to provide financial support to the project company in the form of borrowing, capital increase or other forms when the financial situation of the project company is in difficulty.

Repurchase Safeguards. It refers to the original owner or related party as the promiser, the promiser to sell back, in whole or in part, the securitized products to the holders of the securitized products.

(4) Tranche design and payment methods

Tranche design is the most important internal credit enhancement method for asset securitization products and has an important impact on the cash flow arrangement of asset securitization products (Riddiough, 1997). The tranche design will make asset-backed securities at all levels differ to a certain extent in terms of risk level, issuance scale, expected

return, and duration.

The degree of risk in the tiered design is the primary variable of asset-backed securities tiering. The level of this variable is reflected in the distribution order of the cash flow of the underlying assets. Based on satisfying the conditional assumptions, by introducing the design of the senior-subordinated structure, the repayment of principal and interest and the assumption of losses have a senior to subordinated order, thereby realizing risk reorganization. While the cash flow generated by the underlying assets can support the principal and interest of the asset-backed securities, a reasonable financing scale can be achieved.

In essence, the senior and subordinated structure are to split and grade the cash flow of the underlying assets according to different credit grades and terms. In this way, credit support is provided for senior tranches asset-backed securities. However, affected by the diversity and uncertainty of demand and the characteristics of the underlying assets, the tranche design scheme and issuance scale will be limited by many conditions. Since the cash flow of the underlying asset pool is affected by various internal or external uncertainties at any time, it is dynamic.

As far as the underlying assets of Chinese real estate companies are concerned, the critical factor leading to the dynamic change of the cash flow of the underlying assets is whether the debtor defaults (S. Zheng et al., 2016 ; X. S. Chen, 2019). Combined with the size and distribution of the default ratio of the underlying asset pool, it can be judged whether the cash flow inflow of the underlying asset pool under the given default ratio can redeem the principal and interest of the asset-backed securities (K. Zhou & Yuan, 2014). A preliminary scheme for layering asset-backed securities and their predetermined credit level can be given according to the layering logic (H. Zhou & Pan, 2010). However, the tranche structure and its robustness to obtain a predetermined level also require cash flow analysis and stress testing inspections to satisfy various conditions. If the result is unsatisfactory, it is necessary to adjust the tranche structure or predetermined level or adjust the transaction structure to ensure that the principal and interest of the asset-backed securities can be paid in full and on time at each payment time point. In the absence of external credit enhancement, when cutting the scale of asset-backed securities products at all levels, the priority A-level securities products are first cut, and then the mezzanine securities products and subordinated securities products are sequentially cut. The higher the credit rating required for senior tranches securities products, the thinner the proportion of mezzanine securities products, and vice versa. In general, the stratification of various securities products cut by the cash flow of the underlying assets completely matches the cash flow inflow and cash outflow at each point in time. The frequency of redemption is the

same as the frequency of cash inflows of the underlying assets. However, when the cash flow of the underlying assets fluctuates negatively, there will be a gap in the redemption of securities, and the redemption of principal will not be guaranteed. Therefore, in different layered design schemes, the principal payment method, the trigger mechanism, and the adjustment of the rate of return have an essential impact on the layered design scheme.

(5) Securities sale, management of asset pools and liquidation of securities

The securitization product is restructured, and credit enhanced based on the characteristics and composition of the underlying assets, combined with matters such as projected cash flows of the underlying assets, probability of default of the underlying assets, degree of realization of collateral, and degree of early repayment of default, and the finalization of the securitization product. After issuance and listing for circulation, the SPV receives the proceeds from the issuance of securities and pays the consideration to the originator.

The SPV entrusts the service provider with the management of the asset pool. On the principal and interest payment date of the securities products, the SPV will entrust the trustee to make payments to the investors at a pre-defined time and at a pre-defined principal and interest rate. After the agreed principal and interest are paid in full, if there are still funds remaining in the underlying asset pool, the remaining funds will be paid to the originator. This completes the entire process of the securitization transaction.

2.2 Research on asset securitization

2.2.1   Overview of the academic clue of asset securitization

Asset securitization originated in the early 1970s. The development of asset securitization entered the fast lane at the end of the last century and experienced increasing growth in the years leading up to the financial crisis caused by subprime lending. Before the 2008 financial crisis, the research on the function of asset securitization was more inclined to the micro level. Overall focus on positive features. It mainly includes improving liquidity, optimizing risk management, optimizing capital structure, reducing information asymmetry, and the resulting losses.

Agostino and Mazzuca (2008) studied the securitization motives of Italian banks between 1999 and 2006. Survey assumptions are financing, specialization, and regulatory capital arbitrage. By estimating a probability model, the implementation probability of securitization is associated with a set of balance sheet indicators and a further control variable vector. The

conclusion is that the financing hypothesis is consistent with the data. Affinito and Tagliaferri (2010) studied Italian interbank data between 2000 and 2006. The motivation of asset securitization before the subprime mortgage crisis is summarized as expanding financing channels, diversifying risks, increasing profits and regulating capital arbitrage. Riportella et al. (2010) uses the Logit model to analyze the asset securitization motivation of Spanish banks. The results show that expanding financing channels and improving operating performance are the main drivers of securitization, rather than credit risk transfer and regulatory capital arbitrage. What these scholars have in common is that they agree that expanding financing channels is the main motivation for asset securitization, while the empirical results of motivations such as regulatory arbitrage and risk diversification are quite different. DeMarzo (2004) research found that if the issuer can create a derivative security secured by assets, and if the residual risk of each asset is not highly related, and stratification enables the issuer to use the aggregate risk diversification effect to create low-risk and highly liquid securities. Gorton and Pennacchi (1990) argues that by designing securities that divide the cash flows of the underlying assets, it can reduce transaction losses related to information asymmetry, and create liquid securities by forming a market for corporate debt or government securities. As an alternative to bank intermediation, companies can split risky cash flows to create safer securities.

However, many scholars generally present that the outbreak and transmission of the subprime mortgage crisis are closely related to it. Brunnermeier (2009) study found that the model in which issuing banks hold loans and repay them has been replaced by the "originate-to-distribute" model. In this model, loans are pooled, layered, and then resold through securitization. This shift in the banking model has led to a decline in lending standards. And it has led to an unprecedented credit expansion. This in turn contributed to the rise in house prices. In the end, the mortgage crisis magnified into a serious financial crisis. Criado and Rixtel (2008) study found that the subprime crisis exposed considerable problems in the financial system, including transparency and information deficiencies, valuation of structured financial products, and rating uncertainty. Various securitization or asset-backed securities, such as MBS, ABCP and CDO, have played a crucial role in the development and spread of the subprime crisis. Gorton (2008) study found that the unique design of interrelated or nested securities and special purpose vehicles in asset securitization and the continuous extension of asset securitization structure chain have led to more and more serious problems of asset securitization structure chain and information asymmetry.

After the subprime crisis, academia and regulators agree that a very important reason for the subprime crisis is the excessive innovation and complexity of asset securitization. Ghent et

al. (2019) found that the higher the complexity of asset securitization product design, the higher the possibility of default. However, the rate of return does not increase with the increase of complexity. Lower-quality collateral tends to be more complex in design. Securities from more complex transactions have more defaults. Securities designed to be insensitive to information will maximize the risk of default associated with complexity. Lauretta (2018) studies the interaction between financial innovation and securitization by introducing the rate of financial innovation (ROFIN) as an endogenous variable in the agent-based model. When ROFIN exceeds 50%, financial innovation will do harm to the economic system. And lead to the transformation from a benign business cycle to a non-benign business cycle. When the ROFIN reaches 90%, the numerical simulation is close to the data observed before and during the financial crisis. Solomon (2012) research shows that the occurrence of the subprime crisis is the distributive income obtained by the sponsors from innovative financial instruments at the expense of the interests of creditors, which promotes the excessive and inefficient use of securitization. The opportunistic profits brought by this financial instrument to the sponsors lead to a sustained and steady increase in securitization transactions, but these transactions also lead to inefficient results.

After the 2008 financial crisis, the academic research on the function of asset securitization began to turn to the macro aspect and began to pay attention to its negative function. Beck et al. (2016) research shows that financial innovation has both a "bright" side of innovation that supports growth, and a "dark" side of innovation that leads to fragility. Financial innovation helps to provide valuable credit and risk diversification services to businesses and households, thereby improving the efficiency of capital allocation and economic growth. However, financial innovation has significantly increased banks' profit volatility, fragility and losses during the banking crisis.

J. Li (2015) research presents that asset securitization, an innovative financing model, is a classic form of off-balance-sheet financing, mainly based on the financing of short-term instruments in the money market. As a result, herding effects tend to occur in times of market reversals among investors with high leverage and who are very sensitive to investment information. And eventually, various mismatches of risk, maturity and liquidity occur. In the absence of supervision, this financing model can easily lead to excessive innovation of securitization. If the corresponding functions often go beyond the boundary, it will lead to the potential accumulation of systemic risks, which in turn leads to the instability of the financial system.

Shin (2009) research shows that asset securitization can regulate banks' balance sheets,

while changes in banks' balance sheets determine the supply of credit. In benign financial markets with low risk, banks will expand their balance sheets with the increase of leverage ratio. When balance sheets still need to expand, banks must lower lending standards and even hesitate to lend to subprime borrowers. Therefore, asset securitization not only enriches the sources of funds of financial institutions, but also planted the seeds of the subprime crisis.

Griffin and Maturana (2016) found that many of mortgage loans were fraudulent by investigating many of samples of non-institutional securitization loans from 2002 to 2007. Because banks have lowered the standards for loan approval, banks will not charge higher interest rates for homeowners who report erroneous occupancy rates, and the amount of loans will not change with the securitization threshold. This shows that the misrepresentation in the loan is largely driven by the bank. Rajan et al. (2015) confirmed the same problem by studying the data of subprime mortgages in asset securitization issued between 1997 and 2006. Banks can obtain the quality information of mortgage loans, but the information of low-standard loans issued by banks forms information asymmetry in the process of asset securitization, which makes investors unable to get all the necessary information.

The high leverage ratio is one of the main risk factors facing the current Chinese economy, and the consensus on the rise of the macro leverage ratio is that macro risks continue to accumulate. Ma and Chen (2017) studies have shown that leverage has an "inverted U-shaped" relationship with economic growth: increasing leverage when leverage is low will increase economic growth, and increasing leverage when leverage is high will drag economic growth. The most important thing is that when the housing price lacks sufficient economic support, the higher the leverage ratio, the greater the deviation from the essential value corresponding to the housing price. Fluctuations in the value of real estate collateral caused by house price fluctuations increase bank credit risks and at the same time increase the probability of systemic financial risks. In particular, once housing prices fall more than expected risks that would have accumulated in real estate enterprises, residents and non-real estate enterprises, government departments, and the financial system will spill over through related channels. The asset value and sales income of real estate enterprises both declined, the liquidity of enterprises tightened, and the risk of debt default of real estate enterprises increased. When the value of the properties held by residents and non-real estate enterprises is less than the mortgage loan value, the possibility of supply interruption will continue to increase, resulting in an increased risk of loan default. The local government's inhibition of investment by real estate enterprises will lead to a significant reduction in the land finance and tax revenue that the local government relies heavily on, which will lead to an increase in the probability of government debt default. Financial

institutions hold assets and liabilities through the currency, bond, and interbank markets. When risks in the real estate sector spread to the financial system, the asset status of financial institutions will deteriorate, and debt default will occur. To maintain liquidity, some financial institutions may sell their holdings at lower prices, resulting in a further reduction in the market value of assets. In such a cycle, once the default spreads, it will inevitably lead to systemic risks. Historical experience also shows that the major financial crises in human history are all caused by leverage cycles, and the continuous rise in leverage ratios will lead to continuously growing asset bubbles, which may lead to liquidity risks and even the outbreak of financial crises.

2.2.2   Research on the risks and risk contagion caused by asset securitization

Asset securitization is often blamed for the financial crisis. However, asset securitization is only a means of financing, and it is not asset securitization itself that causes the financial crisis. Instead, the loans generated through asset securitization financing are low-risk or high-risk. Financial Crisis Inquiry Commission (2011) report points out that when the financial bubble burst, many risky subprime mortgages began to default, destabilizing the banking system. As a result, it has become the main factor leading to the financial crisis in Casu et al. (2013) research shows that no matter which country or region the bank is, the loan portfolio with higher credit risk is more likely to engage in securitization activities. Securitized banks tend to hold larger and less diversified loan portfolios. But such banks are less liquid, hold less capital and have higher credit exposure.

Benmelech and Dlugosz (2010) research shows that many novel asset securitization products are designed to obtain high ratings. Credit ratings are determined through error-prone model simulations. Many loans with false high rating and high credit risk have more convenient access to the capital market through securitization. This shows that asset securitization has become a channel for high-risk banks to transfer risk to third parties. Risk transfer has become one of the important motivations of asset securitization.

Uzun and Webb (2007); Minton et al. (2009); Farruggio and Uhde (2015) empirical research shows that larger banks are more likely to securitize and issue larger guaranteed securities. After securitization, banks securitize high-quality assets and retain low-quality assets, which leads to the increase of bank risk (Parlour & Plantin, 2008 ; Malekan & Dionne, 2014). However, this has increased credit risk on banks' balance sheets, making them more vulnerable. After securitization, for a given level of capital, the securitized bank has a higher risk profile (Calem & LaCour-Little, 2004 ; Dionne & Harchaoui, 2007 ; Purnanandam, 2011 ; Agarwal et

al., 2012 ; Michalak & Uhde, 2012 ; Battaglia & Gallo, 2013).

In addition, the credit channel of monetary policy transmission is gradually operated through bank loans. When banks can raise funds through securitization, the increase in loans from asset securitization will weaken the impact on monetary policy. The effectiveness of bank lending channels is affected, which in turn poses a risk to the stability of the financial system. Loutskina (2011) found that banks with higher loan growth during monetary tightening tend to show more liquid portfolios. However, during the 2008 financial crisis, the decline of securitization, one of the main sources of funding, made these banks more vulnerable to liquidity and financing crises.

In the United States, securitization lowers lending standards by lowering the criteria for screening borrowers, low credit rejection rates and misreporting of borrowers' credit status. And because of the complexity of securitization structure, investors must rely too much on credit rating. Thus, asset securitization distorts bank lending behavior at the expense of investors, resulting in a decline in credit quality, which further stimulates and worsens the financial crisis. Asset securitization seems to be the bonds issued by many financial institutions are traded in the capital market. In fact, there is an overlap between issuers and investors, and risk is still excessively concentrated in banks and their closely related financial institutions. Brunnermeier and Sannikov (2014) found that asset securitization shares some risks within the financial sector, but asset securitization also makes banks have a higher leverage ratio, resulting in the continuous accumulation of systemic risks. Bank of America, which is active in securitization, launched low-quality mortgages and then suffered higher default rates (Keys et al., 2009, 2010 ; Keys et al., 2012).

2.2.3   Research on risk prevention of asset securitization

Research on risk prevention of asset securitization include:

(1) Research on bankruptcy remote

In terms of the legal aspects of asset securitization, the deal structure of the transaction is secured by two key core functions, namely true sale and bankruptcy remote, to ensure its structural solidity. The originator makes a true sale of the underlying assets to be securitized to the SPV, thereby giving the SPV the legal effect of bankruptcy remote. The underlying assets that are securitized are separated from the non-securitized assets in this way, and this insolvency isolation mechanism isolates the risk of bankruptcy and reorganization (Frost, 1997). The special purpose vehicle is not only the core of financial innovation in the "alchemy" of asset

securitization, but also the essence and core of the financing structure of asset securitization (Schwarcz, 1994). The division of underlying assets is usually the transfer of underlying assets to an entity called a special purpose vehicle, which is restricted from engaging in any activity other than owning or serving asset securitization assets (Shenker & Colletta, 1991). Normally, a special purpose entity (SPE) organization arises when an asset owner transfers ownership of the underlying assets with expected cash flows to a special purpose entity. The SPE guarantees the effects of bankruptcy remote segregation through legal provisions and strict provisos (Rothman, 2012).

(2) Research on Credit rating

As one of the market gatekeepers, rating agencies use their professional reputation as guaranteed capital to ensure the credit of issuers and the quality of securities issued. The fundamental purpose of the establishment of credit rating system is to solve the problem of information asymmetry in the capital market, to provide true and reliable information to investors (Grossman & Stiglitz, 1980). By adjusting credit ratings in the market, we can influence the behavior of participants at a lower cost, thus avoiding a run on the market due to panic and ensuring financial stability (Boot et al., 2006). However, due to the influence of internal or external factors, the independence of rating agencies has always been threatened.

The main aspects include: first, the reliance on government and regulation; second, the conflict of interest caused by the issuer-pay model (Skreta & Veldkamp, 2008 ; Bolton et al., 2009 ; Mathis et al., 2009 ; Opp et al., 2013 ; Daley et al., 2017). Under this payment model paid to the rating agencies by the issuers of various products, and the issuers of the products maintain a long-term business relationship with the credit rating agencies, and for the purpose of profit, the rating agencies assign inflated ratings to the products issued by the issuers (Mählmann, 2008). Disputed interests due to prior competition between credit rating agencies can reduce the quality of credit ratings and have long-term negative effects (Jiang, 2008). In the market for MBS securitized products, the larger the issue, the more powerful the issuer is and the more power the issuer has to make decisions compared to the credit rating agencies who are on the weaker side. Credit rating agencies often assign inflated ratings to issuers in order to curry favor with the issuer and from a profit perspective (He et al., 2011).

These situations occur not only in the case of product issuance, but also in the case of bank ratings. By giving more business to the credit agencies in order for the credit rating agencies to give the banks satisfactory ratings, the banks have created a mutually beneficial situation, which has ultimately led to questionable rating quality (Hau et al., 2012). The statistics for MBS and ABS yielded similar results (Efing & Hau, 2015). The problem that the rating results are not

true will cause ambiguity in the securities market. When investors face the state of ambiguity, securitization will be significantly reduced (Anderson, 2019). Even the resulting information asymmetry is enough to close the market (Beltran et al., 2017).

The above problems also exist in China. China's rating industry has not cultivated a real reputation mechanism in the process of development (X. J. Liu & Zhang, 2012).Under the issuer-pays model, the phenomenon of "rating purchase" in China is serious. In order to increase market share, rating agencies will adopt the strategy of relaxing rating standards to curry favor with issuers (X. L. Huang et al., 2017).

However, some scholars have found that the rating agencies under the investor payment model will improve the rating quality and promote the stable development of the rating market (Guan, 2018). It is not even necessary to make a choice between issuer payment and investor payment, but multiple payment modes can be cultivated and developed to coexist (S. Shen & Chen, 2017). In addition, an efficient and objective rating can not only alleviate the phenomenon of information asymmetry, but also further improve the efficiency of resource allocation in the capital market (Kou et al., 2015). With the higher degree of information asymmetry, the effectiveness of credit rating in the capital market will be higher. And then make the credit rating become one of the important factors affecting the financing cost (H. B. Shen & Liao, 2014). Through the empirical analysis of leased asset-backed securities, it is concluded that a higher credit rating helps to reduce the cost of issuance, and the credit rating can show the default risk of bonds to a large extent (H. F. Li, 2018). Many scholars believe that a higher credit rating will significantly reduce the financing cost of asset securitization (C. Huang, 2020). In particular, the real estate industry is more obvious (J. P. Zhang & Xu, 2021). With the improvement of the effectiveness of credit enhancement means, the financing cost of securitized products will be reduced accordingly (X. T. Liu & Yang, 2016). Of course, before rating the underlying assets, we also need to use risk isolation, tranche design, excess mortgage, and other measures for credit enhancement, in order to improve the credit rating(Ming et al., 2013).

2.2.4 Research on the economic function of asset securitization

Research on the economic function of asset securitization include:

(1) Effectively reducing financing risk and financing cost

Many scholars suggest that the reduction of financing costs is one of the important incentive factors for the implementation of asset securitization. Asset securitization can obtain lower

financing costs than debt or equity financing. Asset securitization, a new financing instrument, can be created primarily because it gives asset owners a diversified asset portfolio financing model that not only reduces the risk of financing, but also reduces the cost of financing a diversified portfolio of assets (Greenbaum & Thakor, 1987 ; Pavel & Phillis, 1987 ; Hess & Smith Jr, 1988 ; Zweig, 1989).

The external credit enhancement of asset securitization will reduce the financing risk of enterprises (Kroszner & Strahan, 2011). Without increasing the services of external financial institutions, the internal credit enhancement through the design of the underlying asset pool and the risk adjustment in the collateral and various transaction grades is the key to the improvement of credit and the reduction of risk (Nadauld & Sherlund, 2013). The external credit enhancement of asset securitization will reduce the financing risk of enterprises. Pareto improvement can be achieved by keeping risky assets in the balance sheet through asset securitization and transferring risk from avoidant to neutral investors (Benveniste & Berger, 1987). Asset securitization reduces the impact of bank financing conditions on loan supply (Loutskina & Strahan, 2009). Many fixed-income portfolios can be sold through asset securitization, which can not only reduce risk, but also obtain funds with lower financing costs than direct borrowing (Mountain, 2008).

In this process, credit rating will have a corresponding impact on financing costs in terms of debt repayment, guaranteed investment, direct recourse, and targeted transfer (Wojtowicz, 2014). The empirical study of third-party bond rating agencies shows that the impact of bonds and asset securitization on future yields is that the general bond interest rate is lower than the guaranteed bond interest rate classified by credit rating (John et al., 2003).

(2) Improve the liquidity of specific assets

The development of asset securitization in China can build an effective micro-credit basis and investment-grade financial instruments in the capital market. Make the credit foundation realize the transformation from the national macro level to the non-national micro level, so as to fill the defect of the effective investment grade credit basis (W. X. Zhu, 2000). The sustained and rapid growth of housing loans in China has caused a structural contradiction between banks' long-term funds and short-term liabilities. Therefore, it is proposed to resolve structural contradictions and financial risks through asset securitization, alleviate bank liquidity and promote macroeconomic development (X. D. Zhang & Han, 2002).

R. Deng (2012) analyzed the feasibility of applying asset securitization to municipal construction projects and pointed out that asset securitization can be chosen to resolve the risk of local debts. and put forward policy suggestions from the aspects of product design,

intermediary and system guarantee. Wu (2013) research shows that the rapid development of China's real estate market contradicts the slow development of real estate finance. The proportion of real estate loans in bank loans is increasing, resulting in liquidity financial risks. Asset securitization can not only resolve financial risks, but also promote the development of the real estate market. In addition, it demonstrates the necessity and realizable ways of mortgage-backed securitization in China.

S. S. Zhang et al. (2018) concluded through empirical analysis that the solvency and cash flow capacity of enterprises have a significant impact on the motivation of asset securitization, and enterprises carry out asset securitization mainly to supplement liquidity and enhance solvency. J. Li (2014) presents that asset securitization, as an important investment and financing carrier in the financial market, plays the role of shadow banking. Therefore, asset securitization has the mechanism of liquidity expansion. When the liquidity expansion reaches a certain level, it will generate externalities, which will adversely affect financial stability through macro effects.

W. G. Xu and Liu (2017) analyzed the potential liquidity risk of banks under the "initiation-distribution" model by constructing the theoretical model of credit asset securitization. The research shows that under the "initiation-distribution" mode, a single bank only retains part of the assets through haircuts in repurchase transactions for risk hedging, which does not play a role in controlling and reducing the risk. When mortgage securities are likely to face a sharp fall in prices in the future, the risk lurks in the banking and financial systems, and there is the possibility of a crisis at a particular moment. When the market price of mortgage securities is lower than the average yield expected by banks, even sound banks will be affected by financial contagion. C. S. Guo and Xie (2015) uses the system synergy theory to analyze and conclude that the credit asset securitization system can produce greater synergy through the cooperative operation of various subsystems. Moreover, it can improve the overall liquidity of the system and reduce the liquidity risk.

(3) Changing indirect financing dominated by banks into direct financing

K. G. Wang (1999)combed the process and means of asset securitization. According to China's national conditions, it is proposed that the implementation of asset securitization can realize the transformation from indirect financing led by banks to direct financing. And put forward the specific operation ideas for the securitization of non-performing loan assets in the banking industry. D. Zhang et al. (2014) analyzed the problems of scale, market, product liquidity, laws, and regulations in the development of asset securitization in China. It is proposed that asset securitization can not only solve the problem of excessive bank loans, but

also solve the problems of difficult and expensive financing for small and medium-sized enterprises. Yao (2001) focuses on asset securitization as an innovative financing technology. Through the establishment of a new analysis framework of asset securitization, the macro-financial and micro cost-effectiveness of asset securitization are analyzed. It is considered that asset securitization negates the traditional theory of capital structure, and securitization can reduce the cost of capital and increase the value of enterprises. Lancaster et al. (2008) through the research on the asset securitization of small and medium-sized enterprises in the supply chain, it is shown that a large number of high-quality small and medium-sized enterprises in the supply chain make use of the unique credit enhancement ability of the supply chain financing model to improve the credit rating of securitized products and reduce financing risks, so as to provide practical solutions for asset securitization of small and medium.

2.3 Research on asset securitization in real estate industry

The application types of asset securitization in Chinese real estate enterprises can be divided into three types. The first type is Real Estate Investment Trusts (REITs). The second type is called Commercial Mortgage-Backed Securities (CMBS), based on the creditor's rights of commercial real estate assets. The third type is known as Asset-backed Securitization (ABS), based on the property rights of real estate assets. As there is still a certain gap in terms of transaction structure, tax burden level, income source, income distribution and fundraising scope, between China's issued REITs & securitization products and the standardized products in mature markets, the definition is more inclined to "Quasi-REITs " or "Quasi-Asset securitization" (Wang,2017). In the international market, REITs and asset securitization are two independent product types, and some asset securitization products may be financing channels or investment targets of REITs.

(1) Quasi-REITs

Standard REITs are a kind of trust fund that collects the funds of numerous investors in the form of issuing stocks or beneficiary certificates and is managed by a specialized investment agency for real estate investment operation and distributes the comprehensive investment income to investors in proportion. In an international common sense, REITs are similar to funds in nature, and most of them belong to public offering and a few belong to private equity. REITs can be operated in a closed or open mode, mostly adopting the mode of corporate system, and financing and trading can be carried out in the capital market mainly through public listing in the form of equity. The main characteristics of REITs are public offering, real estate investment,

liquidity, tax neutral treatment and emphasis on portfolio management.

At present, China has not yet issued a public offering REITs that fully conforms to international standards. Private placement can only be carried out in the form of non-public offering, and cannot be publicly traded to the public, in essence, it is a kind of private placement product (X. M. Chen et al., 2018). Therefore, in the market practice, these kinds of products, which use special asset-backed plan as the carrier to invest ultimately in the equity products of non-listed companies that hold property, are called "Quasi-REITs".

However, the special asset-backed plan cannot directly acquire the equity of the property company, so it usually purchases the equity of the property company through private fund. Quasi-REITs mainly issue asset-backed securities through the complete property rights of the underlying property held directly or held indirectly by means of private real estate funds. Different from the sales property which takes "development-sales-rolling development" as the chain, Quasi-REITs mainly aim at the revitalization of mature stock assets such as rental property and operational property. The purpose of its product structure design is to conduct full financing based on the value of property assets, to put the property assets and project companies to be included in the pool into a special plan, and to transfer the stable cash flow generated from the operation income of property assets to the investors of asset-backed securities at the side of the special plan.

At present, the research on REITs in China is mainly based on the comparison and reference of international experience (H. K. Sun, 2019 ; Jin et al., 2021 ; X. Wang, 2021). And the research on the operation mode of REITs in the current environment (G. P. Liu et al., 2018 ; X. M. Wang, 2018).

(2) Commercial Mortgage-Backed Securities

Commercial Mortgage-Backed Securities (CMBS), refer to asset-backed securities products, with mortgage portfolio package of single or multiple commercial real estate non-residential properties including office buildings, hotels, conference centers, business service places. to build the underlying assets, with the future income of the relevant real estate as the source to repay principal and interest through structured design (J. Q. Guo, 2016). It is a structured rated bond backed by underlying assets of commercial real estate mortgages. In Europe and America, CMBS is one of the effective financial instruments for commercial real estate companies (Y. J. Xu & Cao, 2016). The advantage of asset securitization lies in breaking through the credit rating of the main body and pricing the financing cost by assets. For CMBS, the financing scale is also linked to the value of the property itself, and the financing scale can be greatly expanded.

As the holder of property assets, the project company takes the cash flow generated by its operation and management of property assets as the main source of payment of trust loans under a single fund trust. On the other hand, the special plan further realizes the income payment to the holders of asset-backed securities through the loan repayment and benefit distribution at the trust side. Therefore, whether the property assets themselves are with clear ownership and have the ability to generate long-term, stable and predictable cash flow is very important for the realization of the overall transaction security.

(3) Other types of asset securitization in real estate

In addition to Quasi-REITs and CMBS, the asset securitization types of real estate enterprises also include balance payment ABS and property management fee ABS, which are manifested as creditor's rights or income attributes. From the point of view of market practice, more real estate enterprises with strong credit and large-scale issue such products.

Property management fee ABS is a securitization transaction based on the underlying asset of the property management fee income collected by the property management company when it signs a property service contract with the owner (Yan, 2017). In the ABS project of property management fee, there are generally two transaction structures according to the different nature and types. One is the property management fee creditor's rights model which takes the property management fee creditor's rights as the underlying assets into the pool. The other is to pledge the property management fee creditor's right to accounts receivables, which is used to guarantee the trust loan/entrusted loan made by the property company as the borrower; and this is the property management fee pledge mode which takes the beneficial right of the trust and the creditor's right of entrusted loan as the underlying assets into the pool. The underlying assets of the property management fee ABS include existing creditor's rights and future creditor's rights. From the accounting point of view, the existing creditor's rights refer to the creditor's rights formed by the labor services provided, and the amount of this kind of creditor's rights can be determined. The future creditor's rights, similar to the asset securitization models such as Quasi-REITs and CMBS, are based on the expected future income of property assets, however, the amount of this income is uncertain because it is affected by many factors, so the property management fee income may rise or fall in the future.

Balance payment ABS is to be in commodity house sale process, buyers and real estate project company sign a "commodity house purchase contract" (hereinafter referred to as the purchase contract), buyers can choose different payment methods to pay (J. Liu, 2017). Payment may be made in full at one time or partially by down payment and the remaining is paid by applying for bank loans (applicable to commercial property sales and residential

property sales), housing fund loans (only applicable to residential property sales), or by installments negotiating with real estate project company. Except for the one-time full payment method chosen by the buyer, there is no longer account period. The other three payment methods can be used as the underlying assets in the pool from the point of view of the special plan of asset securitization. When selecting the underlying assets: first, the original owner should legally own the underlying assets, and there is no mortgage, pledge, or other security right on the underlying assets. Secondly, the underlying assets can be legally and effectively transferred without the consent of the principal or a third party. Finally, the underlying assets do not involve litigation, arbitration, enforcement, bankruptcy proceedings or judicial proceedings that are enforced.

(4) Research on the status of real estate and asset securitization

In order to better illustrate the relationship between real estate and asset securitization and the existing research, statistics on specified keywords related to real estate asset securitization are conducted through the Elsevier journal database (English database) and CNKI database (Chinese database). The specified keywords for the search included three combinations: "real estate and securitization", "real estate and REITs" and "real estate and CMBS". The statistical results are shown in Table 2.1:

Table 2.1 Statistical table of specified keywords for real estate asset securitization

Year	Elsevier			CNKI			Total
	RE and Securitization	RE and REITs	RE and CMBS	RE and Securitization	RE and REITs	RE and CMBS	
2022	1	4			1		6
2021	2	12		7	17		38
2020	6	11	2	7	39		65
2019	1	9		18	48		76
2018	2	10		14	40	2	68
2017	3	9		8	32	1	53
2016	2	6	1	3	29		41
2015	5	11		5	24		45
2014	3	10			14		27
2013	4	11		1	30		46
2012	5	14		1	34		54
2011	1	1		6	36		44
Before 2010	3	20		45	264	1	333
Total	**38**	**128**	**3**	**115**	**608**	**4**	**896**

The above table shows that the study of real estate asset securitization has been of great interest to scholars. CNKI and Elsevier have a total of 896 articles. Combining the keywords "real estate" and "securitization" from both databases, there are 153 articles in the literature. Combining the keywords "real estate" and "REITs", there are 736 articles in the literature.

Combining the keywords "real estate" and "CMBS", there are seven articles in the literature. This shows that more research has been done on 'real estate and REITs' and less on 'real estate and securitization' and 'real estate and CMBS'.

In terms of research focus, most of the literature is on large real estate companies and REITs in real estate securitization. However, the asset composition of real estate enterprises has become quite diversified, including commercial centers, shopping malls and property assets, which are important sources of stable cash flow for real estate enterprises in recent years, but little literature has been devoted to small and medium-sized real estate enterprises and their specific types of asset securitization programs. And, moreover, there is a lack of comprehensive example studies of actual cases.

2.4 Research on the financing status of SMEs

2.4.1 Research on the reasons for financing dilemma of SMEs

Research on the reasons for financing dilemma of SMEs include:

(1) Information asymmetry between financial institutions and SMEs

All along, the critical reason for the financing difficulties and high financing costs of SMEs is information asymmetry (Song & Lu, 2017). Information asymmetry occurs when the distribution of information among different economies is uneven or deviates. Ex-ante information asymmetry can lead to adverse selection in the bank credit market (Roberts, 2015). Ex-post information asymmetry can lead to moral hazards in the bank credit market (Bubb & Kaufman, 2014). However, adverse selection and moral hazard caused by information asymmetry ex-ante or ex-post the event will eventually lead to the problem of credit rationing. As a result, SMEs will have more severe financing difficulties and higher financing costs, and eventually, lead to the failure of the credit financing market. On the one hand, the ex-ante information asymmetry is manifested in the fact that financial institutions such as banks in the credit market lack information on the operating conditions, financial conditions, and actual loan purposes of borrowing companies. Due to opportunistic motives, SMEs take advantage of this situation to hide and conceal negative information that is not conducive to their own loans and exaggerate and magnify favorable information that is beneficial to their loans, which leads to adverse selection and ultimately reduces the efficiency of SME loans. Our country's current credit reporting platform is based on the credit reporting system of the People's Bank of China, but there is no perfect credit reporting system for SMEs nationwide. SMEs will not take the

initiative to disclose information due to their interests and commercial secrets in the business process. Therefore, financial institutions can neither obtain accurate and complete information of SMEs from public information nor find out the operating conditions, financial conditions, and necessary information of borrowing enterprises through other channels. In addition, the proportion of fixed assets of SMEs is relatively tiny, the assets that can be mortgaged and guaranteed are relatively small, and the credit rating of the main body of the enterprise is relatively low. Therefore, after comprehensively evaluating the risks and benefits of loans, financial institutions often choose not to grant loans. If financial institutions lend to such SMEs, they are often compensated with high yields. Credit markets tend to select SMEs that operate with high volatility, high risk and high returns due to adverse selection. They tend to abandon SMEs that operate with low volatility, low risk and low returns. The persistence of this phenomenon exposes and increases credit risks, thus causing financing constraints in terms of lending to SMEs by financial institutions. On the other hand, the ex-post information asymmetry shows that after the financial institutions sign the loan contract with the borrowing enterprises, it is still difficult for the financial institutions to fully supervise the actual situation and efficiency of loan funds by SMEs in the process of "post loan supervision," resulting in moral hazard. Financial institutions lend to SMEs at the expense of SMEs paying high-interest rates. To make up for high-interest expenses, SMEs often choose high-risk, high-yield projects. Some SMEs even defaulted and escaped the repayment of principal and interest to financial institutions due to the lack of credit concepts. Therefore, the default behavior and lousy image of many SMEs have caused many financial institutions to reject the loans of SMEs directly.

To solve the problem of information asymmetry, two forms of credit markets have emerged, namely transactional lending and relationship lending. Transaction lending is generally based on the company's operational information, accounting information, market information, tax information, and asset information to qualify for SME loans (Stein, 2002). When the critical information of SMEs cannot be quantified, or various conditions cannot meet the requirements of financial institutions, financial institutions often put higher requirements on asset mortgages and property guarantees for SMEs, so as to improve the cost and difficulty for SMEs to obtain working capital from traditional banking channels (Y. Zheng et al., 2013). These methods are used to offset the potential default risk of SMEs in lending. Relationship lending is based on the "relationship" between a financing institution such as a bank and an SME (Berger & Udell, 2002), as well as "soft information" such as the "relationship" of SMEs in the social environment. To a certain extent, this makes up for the potential problems caused by the insufficient grasp of crucial information in financial institutions' lending. However,

understanding "soft information" under this "relationship" requires long-term interaction between financial institutions and SMEs to establish a reliable relationship between them. Because of the implicit moral hazard in this approach, small and medium-sized real estate enterprises still have the problem of increased financing difficulties and financing costs in the process of financing from banks and other sources when banks are also unable to participate in the operation of SMEs.

(2) SMEs' low creditworthiness

Credit is the foundation for establishing a modern enterprise system, and the credit of an enterprise reflects the value of the enterprise (Zang, 2014). Modern enterprises rely on corporate assets to form corporate credit and carry out economic activities independently. Credit is the core of an enterprise. If an enterprise loses its credit, it will lose its foothold in the economy and society. Compared with large enterprises, SMEs often have breaches of contract, fraud, and commercial deception due to various active or passive reasons in their business operations. The lack of credit has seriously affected the credit status of SMEs, and seriously inhibited their survival and development.

The lack of credit in the financing process of SMEs mainly includes three aspects. On the one hand, SMEs cannot repay fully and on schedule (Hou, 2017). In the operation process of SMEs, the default price caused by credit default due to the failure to repay the principal and interest in time is not enough to make the enterprise and related personnel subject to shocking punishment. Therefore, SMEs often default, evade, or even illegally settle their debts. It is precise because of many credit defaults that a major credit crisis of SMEs occurs. The fundamental reason is that SMEs do not realize the importance of credit to enterprises, so they do not pay enough attention to maintaining corporate credit. All these SMEs maliciously evading the repayment of bank loans for lack of credit have caused widespread bank reluctance in society, thus aggravating the credit crisis between banks and SMEs. While SMEs have deteriorated bank-enterprise relations due to credit problems, banks tend to lend funds to large enterprises with better credit. This is because large enterprises' lack of credit behavior will lead to higher untrustworthiness costs. Once a large enterprise lacks credit, it will have a severe adverse impact on the business development, reputation, and even credibility. In particular, a bad record in credit means that the entire credit market and capital market in society will shut down the business. On the other hand, SMEs lack repayment ability(Yu Han Wang, 2007). The creditworthiness of SMEs is reflected in the ability to obtain revenue, the ability to repay debts, the ability to innovate and the ability to develop themselves. Among them, the ability to obtain revenue and the ability to repay debts are the cornerstones of credit capacity. With the

development of the market economy, many SMEs have developed along with it, but the business operation is highly speculative, and the foundation of enterprise development is relatively weak. In particular, whether in the past or at present, SMEs generally face the problems of old equipment, poor technology, shortage of human resources and backward management, which often lead to unstable operation, low profitability, and even losses. This leads to the weakening of the profitability and solvency of SMEs in the fierce market competition. When many SMEs lack scientific management ability and planning ability, in order to expand their business scale, they carry out financing once they have the opportunity to finance, even though the rate of return on investment is not enough to cover the loan interest rate, or regardless of the time mismatch of "short borrowing and long investment," which eventually leads to the failure to repay the loan. The fundamental reason is that SMEs are inherently insufficiency due to their small scale and relatively limited operating capabilities, resulting in their inability to repay on schedule. Finally, the lack of financial credit has not only become a stumbling block for the growth and expansion of SMEs, but also a heavy burden for the various guarantee institutions that guarantee them (Wen et al., 2020). Once the guarantee agency has guaranteed it, when the SME defaults due to credit, the guarantee agency is liable for the default, resulting in a loss to the guarantee agency far greater than the revenue generated by the guarantee agency from the guaranteed business. This not only causes losses to the guarantee agency, but also creates a serious obstacle to the development of the guarantee agency. Therefore, SMEs have the potential risk of lack of credit, which further reduces the confidence of guaranteed institutions to provide guarantees for them, thus ultimately causing the financing difficulties set by SMEs for themselves.

(3) Limited financial product and service

Loans to SMEs by financial institutions are mainly state-owned commercial banks, city commercial banks, joint-stock commercial banks and rural commercial banks. Bank loans play a significant role in SME financing (Xing & Liang, 2013). It is generally presented that the distortion of financial policies, the lack of banking expertise, information asymmetry, and the risks of SMEs themselves are the main reasons for the financing difficulties of SMEs (Beck, 2007). To prevent SMEs' credit risk, banks often choose credit technology based on mortgage-guaranteed loans. The defects of mortgage-guaranteed loans have caused the credit gap of SMEs to be unable to meet to a large extent, thus restricting the growth of SMEs (Lv, 2015). In addition, the high threshold of financing in the securities market also makes it difficult for SMEs to have the necessary issuance qualifications. Among the seemingly dozens of financing channels, there are only a handful of financing channels that SMEs can effectively use.

Therefore, in the situation where bank credit is the mainstay, SMEs often need to face the situation of insufficient credit support. This mainly includes three aspects. First, banks are dominant in lending to SMEs. In the process of SMEs applying for bank loans, banks often conduct a comprehensive inspection of the authenticity, security, transaction costs, monitoring costs, SMEs' credit, and collateral. Even with the support of the government's various SME loan support policies and the guarantee of SME credit guarantees in the loan process, if the bank believes that it does not have the conditions for borrowing, it is difficult for any external effect to change the bank's willingness not to lend (C. Liu et al., 2017) . Second, banks have a low tolerance for non-performing loans of SMEs (Qian, 2015). A bank's non-performing loan refers to a loan in which the borrower fails to repay the loan principal and loan interest on time beyond the predetermined period of the loan contract, thereby predicting or causing economic losses to the lender. Non-performing loans are the critical point of bank risk control, and reducing the balance of non-performing loans, and the ratio of non-performing loans is the core of banks to ensure their interests. Under normal circumstances, banks will strengthen risk control by controlling or reducing the balance of non-performing loans, optimizing the governance structure, improving non-performing loan collection and conversion efficiency, and increasing loan issuance by controlling or reducing the non-performing loan ratio. Although the government has issued a policy to support SME financing, it is proposed to increase the tolerance ratio of non-performing loans of SMEs appropriately, and a constant ratio cannot be implemented. However, each bank often implements different standards for SMEs to examine loan risks, loan costs, and write-offs according to their circumstances, so there will be significant differences in the selection criteria. In addition, although banks will relax the tolerance ratio of non-performing loans to SMEs to a certain extent according to their support policies, they still implement tighter management of SMEs in the process of actual lending and supervision. Banks will prioritize real estate SMEs that meet the priority development conditions and have better qualifications to provide loans.

2.4.2 Research on the solutions to reduce financing constraints of SMEs

Chinese SMEs rely heavily on endogenous financing and indirect financing. The lack of direct financing channels leads to financing difficulties for SMEs and seriously hinders the healthy development of SMEs. In exploring and studying whether the assets of SMEs can implement asset securitization, some scholars have made in-depth analyses from the advantages of asset securitization and the financing difficulties of SMEs and put forward their views. Some scholars

have researched and demonstrated the applicability, limitation, and feasibility of asset securitization for SMEs, and proposed that asset securitization is a new way to solve the financing problem of SMEs.

J. Y. Li (2020) research presents that the fundamental assets of SMEs vary widely, and not all primary assets can be "truly sold" to SPVs. Some underlying assets are still highly dependent on the credit of the main body of the enterprise, so it is impossible to achieve an authentic "real sale". However, many scholars have given different solutions to the problem in the area of subject credit. In the early stage of SME asset securitization research, Jian Fang et al. (2003) presented that by establishing an SME alliance and issuing bonds together with a unified subject, the direct financing channels of SMEs could be broadened. Some scholars present that the financing difficulties of SMEs due to their small scale and hard financing constraints can be achieved through industrial clusters or enterprise clusters, asset portfolios, and multi-agent linkage. Based on the formation of continuous and stable cash flow, asset securitization is carried out, thereby providing new ideas for solving the financing difficulties of SMEs (Qi et al., 2018 ; L. Xu et al., 2019). Through their research on the application of asset securitization principles to SMEs, some scholars present that guarantees and trusts can be used as breakthrough models for SME asset securitization (Lei et al., 2005).

For small and medium-sized real estate enterprises, on the one hand, the use of bank loans by real estate enterprises has a short overall debt maturity. It reduces the maturity mismatch of "short-term loan and long-term investment". The debt funds of real estate enterprises are mainly short-term bank loans. Suppose banks do not continue to provide credit support in the process of real estate development and construction. In that case, the short debt maturity structure is not conducive to ensuring the continuity and smoothness of real estate enterprise development and construction and later operation, which is easy to cause "unfinished" risk and operation risk. Therefore, it is necessary to extend the repayment period as a financing method such as asset securitization, increase the medium and long-term funds available to the enterprise, and provide a reliable guarantee for the continuous and stable development of the development, construction, and operation of real estate enterprises. Therefore, under the condition that the overall debt level of real estate enterprises remains unchanged, asset securitization can optimize the debt structure from the dimension of extending the debt maturity, thereby enhancing the matching between the enterprise investment cycle and the debt financing term.

On the other hand, the cost of bank loans for small and medium-sized real estate enterprises is relatively high. Asset securitization is needed to reduce the overall cost of debt effectively. By reducing the cost of debt capital, it can increase the feasibility of investment and

development of real estate projects and increase the endogenous funds available to enterprises through savings in interest expenses. Therefore, under the condition that the overall debt level of real estate enterprises remains unchanged, asset securitization financing can optimize the debt structure from the dimension of reducing financing costs, thereby reducing the financial burden of enterprises, and enabling them to have more economic resources to support development. Finally, real estate companies need to increase their voice in other financing channels by finding new financing channels. The successful issuance of asset securitization products of real estate enterprises means that real estate enterprises have new debt financing channels. The ability of real estate enterprises to enter the capital market for successful financing will help increase the bargaining chips of enterprises, reduce the monopoly power of the banking system on the debt financing market, and help improve the ability of enterprises to negotiate with banks. As a substitute and competitor of bank loans, with asset securitization financing channels, real estate companies can gain a specific say in negotiating other financing channels. Not only is it possible to reduce bank loan interest rates, but it is also possible to extend the term of bank loans. Thus, the direct financing mode of asset securitization has become a new financing channel for SMEs (Lin, 2009). With the continuous exploration of asset securitization theory and the continuous deepening of asset securitization social practice, some scholars present that real estate can be mortgaged to make it have independent value rights and liquidity, so as to build an asset securitization scheme for SMEs based on real estate mortgage, and solve the problem of the SME asset securitization guarantee system (S. Y. Zhang, 2013).

2.4.3 Research on the asset securitization of SMEs in real estate industry

Asset securitization in China started relatively late, and it mainly went through three stages (Ou, 2016). The pilot program was launched in 2005 until it was suspended in 2009 after the outbreak and contagion of the financial crisis in 2008 was closely linked to asset securitization. After the role of asset securitization in "revitalizing existing assets and resolving non-performing assets" was recognized again, the pilot program was not restarted until 2012. After four years of practice and exploration, the size of China's asset securitization market grew significantly in 2016 (C. Liu et al., 2017).

X. H. Sun (2018) points out that asset securitization in China is still in the primary stage, so it cannot be the main channel for real estate companies to carry out financing. Moreover, as bank loans are used throughout the entire process of real estate companies, both large real estate

enterprises and small and medium-sized real estate companies rely heavily on bank credit financing in China's predominantly commercial banking and indirect financing financial system. Moreover, as bank loans are used throughout the entire process of real estate companies, both large real estate companies and small and medium-sized real estate companies rely heavily on bank credit financing in China's predominantly commercial banking and indirect financing financial system. In this context, real estate companies do not need securitization financing at all as they have been able to rely on bank loans for financing for a long time, which is an important reason for the slow development of asset securitization for real estate companies in China. Compared to large companies, the securitization of the assets of small and medium-sized real estate companies has developed more slowly.

In recent years China has made great efforts to reform its financial system by increasing the proportion of direct financing and developing multi-level capital markets. In this context, large real estate enterprises have been able to achieve direct financing through Asset securitization, REITS, SEO, and spin-off listings, even without bank loans, due to the characteristics of high credit rating of the main body, strong supply chain position and diversified asset composition. In particular, in the asset securitization and REITs markets, large real estate companies have been implementing supply chain asset securitization and remaining mortgage asset securitization to obtain financing on their key assets by virtue of their advantageous features (JianGuo Fang, 2015). However, supply chain asset securitization requires real estate companies to have a high subject credit rating, and remaining mortgage asset securitization requires real estate companies to have a large remaining mortgage to create a revolving purchase (X. H. Sun, 2018 ; M. Zhu, 2019).As a result, for small and medium-sized real estate companies, it is usually difficult for them to achieve direct financing through the above-mentioned financing means and to securities their assets through the above-mentioned assets, due to their low credit rating, relatively weak supply chain position and less diversified asset composition (Kong, 2021).

With the changes in national regulatory policies and market environment, the business model of real estate SMEs has also changed from focusing on real estate development and real estate sales to developing and selling holding and operating simultaneously. Therefore, many "holding properties" have also been produced. The increase in the original underlying assets and "holding properties" of real estate enterprises have enriched the underlying assets that real estate enterprises can securitize and formed an ecological chain of real estate asset securitization with various underlying assets of real estate as the core. This change makes the proportion of real estate SMEs leasing and property increasing. The original risks caused by development and

sales are dispersed, so the cash flow generated by the underlying assets of real estate SMEs is more stable.

In addition, while the credit of the subject is important for small and medium-sized real estate companies to implement asset securitization, they rely more heavily on securitizing assets using specific assets with relatively stable expected cash flows (L. Zhang & Lai, 2015). The disadvantage of the low credit rating of the subject of small and medium-sized real estate companies can be offset by securitization of high-quality assets with internal credit enhancement means, such as over cash flow coverage and over collateralization (Y. L. Li, 2019). As a result, securitization of assets implemented by small and medium-sized real estate companies relying on high-quality assets not only reduces reliance on credit ratings, but also reduces moral hazard.

Therefore, this thesis closely combines the above micro characteristics of small and medium-sized real estate enterprises and the macro policy environment of the State's vigorous development of direct financing and explores the design and effectiveness of securitization financing solutions for small and medium-sized real estate enterprises through a typical case study. It can not only provide a practical financing solution for small and medium-sized real estate enterprises in the context of strict real estate control and macroeconomic "deleveraging", but also closely connects with the national financial system reform direction of vigorously developing direct financing and promoting the construction of the capital market system and provides empirical evidence from the real estate industry.

Chapter 3: Methodology

3.1 Methodology determination

A review of the literature from the previous chapter and the fact that Chinese real estate companies are financing themselves: before the increasingly strict regulatory policies in the real estate sector, all real estate companies, including SMEs, were chronically dependent on bank loans, which is a main reason for the slower development of asset securitization for small and medium-sized real estate companies (X. H. Sun, 2018). At the same time, at present, the Chinese asset securitization market as a whole is still in its initial stage and is not a major channel of direct financing for companies. However, as regulatory policies in the real estate industry have become increasingly strict in recent years, traditional bank loans have been subject to extremely strict restrictions, while at the same time China has begun to initiate a vigorous reform of its financial system to promote direct financing. In this context, large real estate companies can carry out supply chain asset securitization and remaining mortgage asset securitization by virtue of their high subject credit rating, strong supply chain position and diversified asset composition (JianGuo Fang, 2015). In contrast, for small and medium-sized real estate companies, not only do they have a low subject credit rating and relatively weak supply chain position, but they also do not have a diversified asset composition, which often makes it difficult to carry out asset securitization(Kong, 2021). Fortunately, some small and medium-sized property companies still have part of specific high-quality assets by virtue of their market segment operating characteristics. Based on specific high-quality assets, asset securitization is also an important means of direct financing for them if appropriate bankruptcy remote and credit enhancement instruments can be selected. Based on this, the two research questions and corresponding research methods chosen for this thesis are respectively as follows.

First, How to propose a direct financing channel for small and medium-sized real estate companies in line with the direction of dual economic and financial reforms, based on the economic background of strict regulation and control of the real estate industry and the background of vigorous development of the financial system of direct financing in China, through an analysis of the necessity and feasibility of securitization financing for small and medium-sized companies？

Second, how to design a securitization program including underlying asset pool construction, choice of bankruptcy remote and credit enhancement means, and product tranches

based on the asset composition status of small and medium-sized real estate companies and the low credit rating characteristics of the subject, through typical case studies?

3.2 Research method

3.2.1   Qualitative method

To answer the first research question of "How to propose a direct financing channel for small and medium-sized real estate companies based on the economic background of strict regulation and control of the real estate industry in China and the background of vigorous development of the financial system of direct financing, which is in line with the direction of dual economic and financial reform" We have conducted an in-depth analysis of the current financing situation of Chinese small and medium-sized real estate companies based on data released by the National Bureau of Statistics, the China Securities Regulatory Commission and the National Association of Financial Market Institutional Investors, we have conducted a specific and in-depth analysis of the necessity and feasibility of implementing asset securitization for small and medium-sized real estate companies.

The necessity lies in the fact that the real estate sector is closely linked to the transformation and development of the Chinese economy and the stability of the Chinese financial system. The transformation of real estate from indirect to direct financing through asset securitization is a financing model that is encouraged and strongly promoted by the government. Moreover, as a form of financial innovation, real estate asset securitization can help banks and companies realize their stock of assets quickly by introducing large amounts of private capital, which not only broadens the financing channels for small and medium-sized real estate companies, but also improves the efficiency of financing. Its viability lies in the fact that various regulatory authorities in China have intensively issued various policies to actively promote and regulate asset securitization business and strongly support the development of asset securitization. After a long period of theoretical exploration and practice, the securitization of real estate companies in China has seen a year-on-year increase in the scale of issuance since 2015. The combing of the eco-chain of small and medium-sized real estate companies shows that the underlying assets of small and medium-sized real estate companies are suitable for asset securitization.

3.2.2   Case study method

To answer the second research question of "How to carry out the securitization program design

for the construction of the underlying asset pool, the selection of bankruptcy remote and credit enhancement means, and product tranches based on the asset composition status of small and medium-sized real estate companies and the low credit rating characteristics of the subjects" We conduct a case study. This included an analysis of the assets of "Company A" to determine which assets qualified for securitization. And applied asset securitization methods to them.

Yin (2010) presents a real-life phenomenon by conducting an empirical study of a phenomenon from multiple sources of evidence. Bent (2006) presents the case study method to be an important complement to other research methods compared to other methods. Thomas (2013) presents that the case study method takes the relationship between all elements as the object of study and examines the integrity of the physical object from multiple perspectives. Creswell and Poth (2018) present the case study method to be a qualitative research method, which is characterized as interpretive, descriptive and exploratory. Stewart and Gapp (2014) present that the object of study in the case study method can be a company, or a part of a company. Stake (2005) presents that the key to the case study method is analytical eclecticism. He presents the case study method to be a design framework and not a research method. Gomm et al. (2000) consider that multiple sources of data should be used in order to reduce bias. From this, detailed explanations and illustrations can be obtained in a few cases. Simons (2009) presents that the object of the case study method can be a project, an institution, a scheme, or a real-life idea.

[This page is deliberately left blank.]

[This page is deliberately left blank.]

Chapter 4: Necessity and Feasibility Analysis of Real Estate SMEs Asset Securitization

4.1 Necessity analysis of real estate SMEs asset securitization

4.1.1 Real estate is related to the transformation and development of chinese economy

All along, the development of China's real estate market has been closely related to China's economic growth. The characteristics of a short construction cycle, great demand for building materials, and strong spillover effects on downstream industries enable the real estate industry to rapidly drive GDP and achieve more remarkable economic growth in the short term. Especially when economic growth is sluggish, local governments often have stronger motivation to increase support for real estate investment projects to achieve the pre-set GDP targets. The real estate industry has become an essential pillar of national economic growth and a carrier that undertakes essential economic functions by driving-related industries, labor employment, and investment.

From the perspective of total volume analysis, the proportion of the added value of the real estate industry in GDP has steadily increased, and the contribution rate has continued to rise (J. B. Li et al., 2015). As shown in Annexes 4.1, China's GDP increased from CNY9.05 trillion in 1999 to CNY91.92 trillion in 2018, an increase of 10.15 times. Accompanied by the growth of GDP, the added value of the real estate industry increased from CNY367.4 billion in 1999 to CNY6.46 trillion in 2018, an increase of 17.58 times. Moreover, except for 2004, 2008, and 2014, which were lower than the GDP growth rate, all other years exceeded the GDP growth rate. From the proportion of industrial added value, the proportion of real estate industry added value to GDP has continued to record highs, increasing from 4.0% in 1998 to 6.65% in 2018 (NBS, 2018h).

From the perspective of the proportion of industrial added value, as the proportion of the real estate industry in the secondary and tertiary industries increases, the economy is increasingly dependent on real estate. As shown in Annexes 4.2, the proportion of the added value of the real estate industry in the added value of the secondary industry increased from 8.96% in 1999 to 16.35% in 2018, an increase of 82.47%. The proportion of the real estate industry's added value in the added value of the tertiary industry increased from 10.54% in 1999 to 12.74% in 2018, an increase of 20.87% (NBS, 2018g).

Real estate investment ignores productive capital accumulation so that real estate investment can stimulate aggregate demand. Judging from the changing trend of fixed asset investment in the whole society, after 1998, with the determination of the status of real estate as a national pillar industry, real estate investment has become the second largest industry in the whole society after fixed asset investment relaying manufacturing. As shown in Annexes 4.3, from 2004 to 2017, the proportion of real estate investment in the total social fixed asset investment has always been between 22% and 27% (NBS, 2017). The growth rate of the real estate industry has exceeded the growth rate of fixed-asset investment in the whole society in 7 of the 14 years. With the state's overall regulation of the real estate industry in 2014, the growth rate of investment in the real estate industry began to decline. The investment in fixed assets in the whole society also showed a similar downward trend. It can be seen from this that the proportion of real estate investment is too large or too small, and the growth rate is too fast or too slow, which is not conducive to long-term economic growth (Ye Hui Wang, 2019). While the manufacturing industry continues to slump, the real estate and capital markets have alternately prospered. The continuous increase in the proportion of real estate investment in fixed-asset investment has led to a continuous decline in the support and promotion of financial resources for the development of the real economy. The occurrence of this situation hinders the development of the real economy and inhibits financial efficiency. Under the "system of tax distribution" fiscal model, the over-reliance of local governments on the development model of land transfer to obtain fiscal revenue and investment to drive economic growth has further deteriorated the quality and efficiency of economic growth. The incompatibility between real estate investment and population and industrial growth in various country regions has resulted in the deviation of resource allocation and market demand. Excessive investment in real estate has increased the pressure of destocking and caused the decline of financial resources to support other productive capital, thereby hindering the long-term growth of the economy.

The development of the real estate industry attracts many social funds and bank loans into the real estate industry. It occupies too much human and material resources, so a situation of "one industry is prosperous, and all industries are declining" has been formed. In particular, when the rate of return on financing capital in the real estate industry is significantly higher than the highest rate of return that other industries can provide, it accelerates the separation of financial resources from the real economy. Although some credit resources have flowed to enterprises in the real economy, these enterprises have withdrawn financial resources from the real economy sector utilizing bridge investment and financial asset investment and flowed to the real estate market, resulting in a decline in the financial support for the real economy. The

real estate industry, which lacks sufficient support from macroeconomic fundamentals, has spawned a housing price bubble and created huge hidden systemic risks. As a pillar industry of China's economic development, the real estate industry is indisputable, but it also profoundly binds the Chinese economy. For an economic system with a large proportion of real estate, the fluctuation of the real estate market is directly related to the fluctuation of the macroeconomy (Tang et al., 2010). Since 2008, a downturn has shown in the macroeconomy, and a series of stimulus policies have been implemented on the real estate market for the sake of stable economic growth. As a result, China's macroeconomic regulation is faced with increasing leverage to stimulate the growth of the real estate market, which will lead to intensified credit bubbles in the real estate market and increase economic and financial risks. Controlling leverage to suppress debt expansion in the real estate market will lead to increased downward pressure on the economy, resulting in the dilemma of economic and financial instability. To gradually get rid of the past practice of treating the real estate industry as a "life-saving straw" for stabilizing economic growth, the government has proposed supply-side structural reforms since 2016. Taking "de-capacity, de-stocking, de-leveraging, cost reduction, and making up for shortcomings" as the main task, the model of economic growth will be gradually transformed from investment-driven to innovation-driven. Therefore, the external economic environment of the real estate industry has become increasingly severe.

4.1.2   Real estate is related to the stability of china's financial system

In China, the problems of unbalanced financing structure and high macro leverage ratio have long existed (Min et al., 2017). It is mainly reflected in the imbalance between direct and indirect financing, the imbalance between debt financing and equity financing, and the imbalance between government debt and corporate debt. According to a Bank of China research report, in 2018, RMB loans accounted for 81.4% of total social financing (P. J. Li & Fan, 2019). China is an indirect financial system dominated by commercial banks, and the contribution of real estate loans is particularly important. As shown in Annexes 4.4, from 2011 to 2018, the year-on-year growth rate of real estate loan balances far exceeded the year-on-year growth rate of social financing scale and the year-on-year growth rate of bank loan balances. Although the real estate industry was affected by further national policy regulation in 2016 and the growth rate slowed down, the two essential indicators of the real estate loan balance still showed an upward trend. From 2011 to 2018, the proportion of real estate loan balance in social financing scale increased from 14% to 19%; the proportion of real estate loan balance in bank loan balance

increased from 20% to 28% (NBS, 2018j).

Over the past decade, the continuous rise of our country's macroeconomic leverage ratio is primarily related to the long-term high leverage ratio of the real estate industry (Research Center for National Balance Sheet, 2018). In particular, the proportion of bank loans in various types of financing has increased significantly. The rapid expansion of bank loans with government credit support and real estate as collateral will lead to the concentration of financial risks in banks and the government and quickly form a self-reinforcing mechanism, resulting in accumulated overcapacity, real estate bubbles and debt leverage risks. As shown in Annexes 4.5, from 2008 to 2018, the leverage ratio of the real economy sector rose from 141.1 to 243.7%, an increase of 72.71%. The overall leverage ratio of the real estate industry rose from 62.91% to 79.46%. Although the real estate industry was regulated more vigorously in 2016, the leverage ratio of the real estate industry maintained a slight upward trend from 2016 to 2018. In order to reduce the leverage ratio of the real estate industry, the real estate industry began to transfer inventory from enterprises to residents continuously, so the leverage ratio of residents continued to rise, from 17.86% in 2008 to 53.2% in 2018 (NBS, 2018f).

However, the high level of investment in China's real estate industry for many years has resulted in a high leverage ratio and caused high inventory in the real estate industry and the continuous extension of the destocking cycle. As shown in Annexes 4.6, in 2018, commercial housing for sale in China was 520 million square meters. Based on the sales area of commercial housing in 2018 of 1.716 billion square meters, it only took 3.6 months to complete the destocking. However, the construction area in 2018 was as high as 8.223 billion square meters, which was 15.69 times the area for sale. The construction area and the area for sale are 8.747 billion square meters. According to the sales rate in 2018, the sales cycle is 5.1 years (NBS, 2018e). Suppose the potential inventory of approved unconstructed land, self-built houses, tiny property rights houses are considered. In that case, the overall inventory of the real estate industry will be more extensive, and the destocking cycle will be longer. Since many industries such as steel, cement, electrolytic aluminum, and flat glass are directly related to real estate investment, the excessively high real estate inventory will lead to a rapid decline in investment growth and insufficient demand, resulting in the prevailing overcapacity in the Chinese economy.

On August 20, 2020 and December 28, 2020, China's real estate regulatory authorities, under the current regulatory policies, issued "Key Real Estate Enterprises Fund Monitoring and Financing Management Rules" and "Notice on Establishing Banking Financial Institutions Real Estate Loan Concentration Management System" (PBOC, 2020a). Under the consistent policy

environment of strict control, these two policies have set the strictest and most precise quantitative indicators ever for the bank credit financing channel that regards real estate enterprises as the "lifeline". With the introduction of the policy, the regulatory authorities have further locked in the liquidity of real estate enterprises from the capital supply side and the capital demand side. These two policies have made the real estate industry strictly controlled by the "red line" on the fund supply side through clear quantitative indicators and strictly constrained by the "red line" on the fund demand side. On the capital demand side, the growth rate threshold for the scale of interest-bearing liabilities is set in four tranches for the three indicators on the enterprise side. The bank credit supply scale threshold is set on the fund supply side by dividing the two indicators on the bankside into five tranches. Based on the different circumstances of each bank, different upper limits for the proportion of real estate loans and upper limits for the proportion of personal housing loans are set respectively. For example, the proportion of sizeable state-owned bank loans with the highest ceiling is 40% and 32.5%, respectively. The proportion of rural bank loans with the lowest ceiling is 12.5% and 7.5%. The management and control of quantitative indicators on the demand and supply sides of funds means that real estate enterprises cannot arbitrarily increase the leverage ratio as before. The more funds lack real estate enterprises, the more restrictions on their financing. As of June 2021, under the background of the continuous strengthening of various regulatory measures and macro policy control in the real estate industry, the real estate credit indicators have shown a continuous decline in both indicators. The growth rate of real estate loans hit an eight-year low, with real estate loans increasing by 9.5% year-on-year, lower than the 2.8% growth rate of various loans. The concentration of real estate loans declined for nine consecutive months, and the proportion of real estate loans in various loans fell by 0.95% year on year.

The introduction of the "red line" policy has brought a huge impact and change to the financing model of the real estate industry. The era of real estate enterprises relying on financial leverage to overtake in corners no longer exists. The mode of financing supervision has changed from channel control to "governance by enterprises", which has accelerated the transformation of real estate enterprises' financing channels from relying on traditional debt financing to expanding equity financing, supply chain finance and asset securitization. However, many real estate enterprises are trying their best to adjust the debt structure of enterprises by changing the mode of financing channels, borrowing new ones to repay the old ones, and accelerating the return of funds through sales at reduced prices. It should be noted that many real estate enterprises have formed huge debts by relying on the aggressive bank credit expansion and development model for many years, and they cannot successfully reach the "red line" standard

through overnight efforts. More real estate giants are precarious under the strict supervision environment. For example, China Evergrande Group, one of China's top three real estate enterprises, is constantly selling assets, accelerating the return of funds through various methods, and reducing financial leverage. At the same time, it still has a huge debt default and is in a situation of bewilderment on all sides. For another example, "China Fortune Land Development Group", one of China's top ten real estate enterprises, issued a debt default announcement on September 4, 2021, and the default debt amount reached 87.899 billion by the end of the day. On the same day, "Blu-ray Group", one of the top 30 Chinese real estate enterprises, also issued a debt default announcement, and the default debt amount reached 18.664 billion by the end of the day. For another example, under the strict supervision of the real estate industry policy environment and credit environment, the top ten real estate enterprises in China, R&F Properties, and the impact of adverse industry events on the real estate financing environment not only seriously affected their refinancing, but also caused their solvency to continue to deteriorate. As a result, bond prices fell sharply, and the stock price fell from HK$9.7/share in early June 2021. As of September 17, 2021, it fell to HK$4.550 per share, a more than 50% drop. Compared with the highest point of 24.84 Hong Kong dollars / share, it has dropped by 82%. However, even in such a robust regulatory environment, through the statistics of the financial data of 60 typical sample real estate enterprises screened, it is found that 40% of the real estate enterprises still have a net financing cash flow greater than 0 due to active and passive factors. These enterprises are still maintaining an indirect financing-driven development model.

It is conceivable that the continuous growth of real estate loans and their high correlation with China's macro leverage ratio will indirectly push up the real estate price bubble and be the primary source of China's systemic financial risks. Actively and prudently reducing corporate leverage is the key to reducing our country's total leverage and preventing and defusing significant risks. At the same time, since the "18th National Congress of the Communist Party of China" in 2017, the central government has initiated financial supply-side structural reforms, focusing on vigorously developing direct finance, preventing, and controlling systemic financial risks, and deepening financial system reforms. Among them, the prevention of systemic financial risks is the first task of the "three tough battles", and the destocking, capacity reduction and leverage reduction of the real estate industry are the joint points to solve structural problems in a package, and a vital carrier to implement the task of risk prevention and control.

4.1.3 Asset securitization is an important tool for vigorous development of direct finance

China has been an indirect financial system dominated by commercial banks for a long time. However, with the deviation of economic growth and financial structure, various contradictions and problems have become more prominent. When there is a dual relationship between real estate and financial assets, real estate is an essential asset of residents and enterprises, and the financial assets of banks correspond to the real estate in the hands of residents and enterprises, and residents and enterprises form liabilities to banks through real estate financing. Since loans are highly dependent on collateral, collateral distribution has become an essential factor affecting bank capital flow and capital allocation. The contradiction between economic growth and financial structure increases systemic risks.

With the continuous deepening of the financial supply-side structural reform, the government has vigorously promoted the development of direct finance, which has become one of the necessary means to solve the current unbalanced and insufficient financial development in our country. As shown in Annexes 4.7, from 2014 to 2018, there were two critical meetings involving direct financing for development, and the financial authorities issued as many as 14 policy documents.

We can reduce the excessive reliance on indirect financing mainly based on bank loans by developing direct financing. To achieve the goal of maintaining the financial support for the real economy while stabilizing the leverage ratio. Moreover, the development of direct financing will undoubtedly have a considerable effect on the real estate industry to achieve deleveraging, steadily resolve existing debts, and adequately reduce debt levels. Direct financing is a vital force in helping to drive capital formation and reduce corporate leverage. Under the current background of the country's vigorous development of direct financing and the requirement to "deleverage" and prevent systemic financial risks, financing channels such as bank loans, corporate bonds, funds, and asset management plans have been continuously tightened. As a form of financial innovation, asset securitization can help banks and enterprises quickly realize the stock assets by using the capital market and realize direct financing and reduce the leverage ratio. Therefore, asset securitization, a direct financing method, is important to resolve systemic financial risks.

4.1.4 Asset securitization can meet the innovative financing needs of real estate SMEs

In the context of the national economic and financial requirements for "de-leveraging" and

prevention of systemic financial risks, financial leverage represented by bank funds has been dramatically reduced. As well as restrictions on capital markets such as equity and bonds, various financing channels for real estate SMEs have been entirely suppressed. Therefore, real estate SMEs with a single financing structure has generated an endogenous demand for innovative financing methods.

On the one hand, real estate projects developed by real estate enterprises have the characteristics of enormous capital demand, slow capital turnover, and a long investment recovery period. It is not easy to complete the development and construction of real estate projects only by relying on the company's own funds, so external financing must compensate. As shown in Figure 4.1, in 2018, among the sources of development funds for real estate enterprises, sales receipts, construction and other accounts payable, and bank credit accounted for 39%, 18.3%, and 9.4% of the sources of development funds for real estate enterprises, respectively. According to the relevant regulations of the People's Bank of China and the Ministry of Construction, the sales proceeds mainly include the buyer's deposit, down payment and bank mortgage loan. The down payment ratio for the first home is 30% of the total house payment, and the private housing mortgage loan ratio is 70%, that is, the indirect loan ratio obtained through the bank is about 70%.
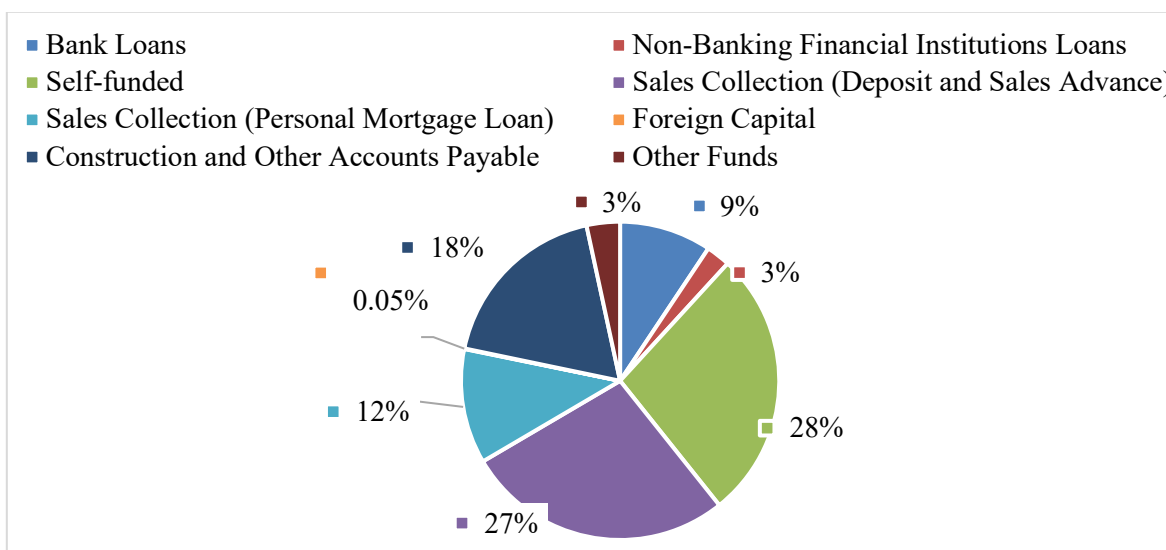
Figure 4.1 Sources of real estate enterprise development funds in 2018

Source: NBS (2018b)

As shown in Annexes 4.8, the main financing channels of real estate enterprises in 2018 included private housing mortgage loans, bank loans, construction payables and other accounts payable in the balance of interest-bearing debts. They accounted for 39.68%, 24.03%, and 18.38% of real estate development capital sources. The overall scale of bank credit reached 63.71% (NBS, 2018i). The excessive proportion of bank credit in the real estate capital market, and the

risk factors of resource mismatch and maturity mismatch in bank credit financing methods have increased the liquidity risk of real estate enterprises. The source of funds of real estate enterprises is too dependent on the banking system, which increases the possibility that fluctuations in the real estate industry will bring systemic financial risks. Therefore, the banking industry has strengthened the supervision of real estate enterprises' credit issuance and concentrated on state-owned enterprises or listed real estate enterprises with controllable debt scale and financial leverage, strong solvency, and good credit. Real estate SMEs with insufficient credit and high-debt real estate enterprises are restricted from obtaining bank credit, thus making it impossible for real estate SMEs to obtain bank loans. After the overall tightening of bank credit, the capital market, the financing channel for real estate enterprises, has also been squeezed by unprecedented policies. Since August 2010, the China Securities Regulatory Commission has suspended IPOs and A-share offerings for real estate enterprises involved in idle land and violations. Due to the state's regulation of the financial capital market in the real estate industry, since 2010, no real estate company has been approved by the China Securities Regulatory Commission's Stock Issuance Review Committee. Some large domestic real estate enterprises can only be listed on overseas markets such as Hong Kong stocks for financing or backdoor. On October 28, 2016, the Shanghai Stock Exchange issued the "Letter on the Trial Implementation of the Classified Supervision of Corporate Bonds in Real Estate and Overcapacity Industries" to bond underwriters to supervise and regulate bond issuance and financing in the real estate industry. On November 11, 2016, the National Development and Reform Commission issued the "Opinions on Enterprise Bond Review and Implementation of Real Estate Control Policies", restricting real estate development enterprises from issuing corporate bonds for financing for commercial real estate projects. As real estate enterprises' regulatory policy on bond issuance continues, bond financing remains sluggish.

On the other hand, local governments have now formed a financing model with the local government financing platform as the primary carrier, land reserves as the leading mortgage support, and bank credit as the primary source of funds. As of the first half of 2017, the total scale of bank loans involved in the real estate industry was about 43.3 trillion-yuan, accounting for 37.8% of the total loan balance and 25.5% of the total bank assets (Mei et al., 2021). Under the circumstance that the solvency of local governments is highly correlated with land prices, and land prices and housing prices, the regulation of housing prices will inevitably have many impacts on the macroeconomy. Therefore, the level of land prices directly affects the solvency of local governments. High land prices are the primary driver of high housing prices, and high housing prices have raised land prices, and the regulation of housing prices will affect land

prices. Therefore, the regulation of housing prices will inevitably affect the land price as the main cost of housing prices. Once the housing price falls to a certain threshold, the value of the local government's land collateral will shrink and the land-related income will decline, which will hurt the local government's solvency, and the local government's default risk will increase. When local governments are unable to repay their debts and the scale of local government debt is too large, local governments default, which will directly impact the financial sector's balance sheet, thereby causing systemic financial risks.

The above two aspects fully demonstrate the unity of the real estate industry and real estate enterprises in the overall financing structure of the society and the systemic risks that may be caused by the over-reliance and association of all parties on bank loans. However, real estate SMEs undoubtedly need capital support for development or survival. Therefore, real estate enterprises need to find new financing channels to cover the capital gap. As a form of financial innovation, real estate asset securitization can help banks and enterprises quickly realize stock assets by introducing many private funds, thereby broadening the financing channels of real estate SMEs and improving financing efficiency. For small and medium-sized real estate enterprises, asset securitization can, on the one hand, solve the problem of short maturity of overall debt and maturity mismatch of "short borrowing and long investment" that exists when using bank loans. On the other hand, through a new financing channel such as asset securitization, small and medium-sized real estate enterprises can increase their voice in other financing channels, potentially not only reducing the cost of financing but also extending the maturity of their debts. From this, it can be seen that in the case of a single financing structure in the real estate industry, there is an endogenous demand for innovative financing methods.

4.2 Real estate SMEs asset securitization feasibility analysis

4.2.1   Policies strongly support asset securitization

Through the survival of the fittest and the strengthening of consolidation efforts, the problems of destocking and overcapacity in real estate have been significantly alleviated. However, preventing financial risks and governance and vigorously developing direct financing are crucial links. The development of direct financing depends on the reform of the financial supply side. Therefore, by vigorously developing direct financing and supporting the development of innovative financing models such as asset securitization, the market mechanism can fully play its role and can more effectively help the development of the real economy.

China's asset securitization started relatively late. It has been more than ten years since 2005. It has also experienced many years of exploration and stagnation during this period. Since 2014, the regulatory authorities have changed the asset securitization business from the approval system to the filing system. Since the State Council expanded the scope of the asset securitization business in 2015, China's asset securitization business has achieved tremendous development. At the same time, in the context of the rapid development of China's corporate asset securitization market, regulatory authorities at all levels have intensively promulgated various policies to promote and regulate the development of asset securitization business actively. As shown in Annexes 4.9, from 2013 to 2018, financial authorities issued 16 policies, and stock exchanges and industry self-regulatory organizations issued as many as 24 policy documents.

With the continuous promulgation of various support policies, since 2014, the scale of asset securitization issuance in China has continued to increase significantly. As shown in Annexes 4.10, in 2014, the asset securitization market issued 104 products with a total issuance size of CNY331 billion. In 2018, the asset securitization market issued 950 products with a total issuance size of CNY2.0139 trillion, an increase of 8.13 times and 5.08 times respectively. (CSRC, 2018, December 31).

After the development of asset securitization in China in recent years, it has become more mature and standardized. In terms of policy, it continues the trend of support and encouragement and encourages the further expansion of the scope of pilot projects in terms of policy. According to the information disclosed in the annual report released by the Shanghai and Shenzhen Stock Exchanges in 2018, the participating institutions of the particular asset securitization scheme can perform their duties following the regulations and agreements, the cash flow collection of underlying assets meets the expectations, the standardization of cash flow collection and transfer is improved, and the credit level of asset-backed securities is basically stable. Based on the above-mentioned good development trend, on April 26, 2021, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the "Opinions on Establishing and Improving the Value Realization Mechanism of Ecological Products", requiring more support for green finance. This shows that the state encourages the exploration of new paths and models of asset securitization in terms of policy. On June 29, 2021, the National Development and Reform Commission issued the "Notice on Further Doing a Good Job in the Pilot Work of Real Estate Investment Trusts (REITs) in the Infrastructure Sector". The notice emphasizes strengthening support and guidance for publicly offered REITs, strengthening project management and coordination services for publicly

offered REITs, strictly controlling project quality, promoting long-term healthy development, and strengthening departmental collaboration and policy implementation. At the same time, it is clarified that projects that meet the conditions in all regions of the country can be declared; the pilot industry will add two major industry categories of energy infrastructure and affordable rental housing, and the municipal infrastructure category will increase the parking lot project; two new pilot areas for exploration and development have been added, namely, water conservancy facilities with functions such as water supply and power generation, and tourism infrastructure with relatively good returns. This shows that the policy encourages the further expansion of the pilot scope of asset securitization. From this, it can be concluded that the internal environment of real estate asset securitization is mature and feasible, whether in terms of macro-level policies and data or micro-specific operations.

4.2.2   Real estate asset securitization has been practiced

Contrary to the continuous tightening of the credit environment in the real estate industry, the Chinese government and regulators encourage the exploration of asset securitization paths and models and further expand the scope of the pilot industry. Therefore, the scale of China's asset securitization market continues to grow. In the first half of 2021, a total of 1.41 trillion of standardized asset securitization products were issued, and the stock size at the end of June was CNY5.49 trillion. The development of the asset securitization market and the continuous advancement of innovation have played a positive and vital role in accelerating the revitalization of existing assets, assisting corporate financing, and serving the real economy. As shown in Annexes 4.11, credit ABS issued CNY427.056 billion in the first half of the year, a substantial increase of 105% year-on-year, accounting for 31% of the total issuance; the stock at the end of June was CNY2,343.761 billion, an increase of 19% year-on-year, accounting for 29% of the total market. Corporate ABS issued CNY736.039 billion, an increase of 20% year-on-year, accounting for 52% of the total issuance; the stock at the end of June was CNY2,940.362 billion, an increase of 25% year-on-year, accounting for 54% of the total market. ABN issued CNY256.657 billion, a year-on-year increase of 53%, accounting for 18% of the total issuance; the stock at the end of June was CNY942.584 billion, a year-on-year increase of 59%, accounting for 17% of the total market. Among them, personal residential mortgage-backed securities (RMBS) are still the most prominent type of issuance among the credit asset securitization products, with a year-on-year increase of 313%, accounting for 62% of the issuance of credit ABS. Enterprise asset securitization products, supply chain accounts,

financial leasing, personal consumption finance, small and microloans, and CMBS/CMBN are enormous issuance scales, accounting for 22%, 12%, 9%, 9% 8% of issuance, respectively.

After continuous exploration and development of asset securitization in China, the first REITs product appeared in April 2014, and the first standard CMBS product appeared in August 2016. With the gradual acceleration of the exploration of asset securitization, the first batch of 9 publicly offered REITs products have been publicly offered since May 31,2021 and have been officially listed on the Shanghai and Shenzhen Stock Exchanges June 21. During the period, China's real estate asset securitization products also experienced explosive growth. As shown in Annexes 4.12, it is estimated that as of December 2018, the China Securities Regulatory Commission and the National Association of Financial Market Institutional Investors issued a total of CNY412.126 billions of real estate asset securitization products with a stock balance of CNY408.906 billion (CSRC, 2018, December 31). The National Association of Financial Market Institutional Investors issued 22 ABN products, with a full scale of CNY31.292 billion and a stock balance of CNY31.2 billion. The China Securities Regulatory Commission issued 324 ABS products, with a full scale of CNY380.834 billion and a stock balance of CNY377.705 billion. After a long period of theoretical exploration, asset securitization of Chinese real estate enterprises has been put into practice, and the issuance scale has increased year by year since 2015.

China's real estate asset securitization products are mainly divided into nine categories. As shown in Annexes 4.13, factoring debt financing, real estate investment trust REITs, commercial real estate mortgage loans and accounts receivable issuance are relatively large, with CNY30.2 billion, CNY65.4 billion 101 billion and CNY157.2 billion respectively. More issuers chose to issue real estate investment trust REITs, commercial real estate mortgage loans, trust beneficiary rights and accounts receivable products, accounting for 16%, 16%, 11%, and 42%. In terms of specific types, the asset-backed securitization products issued by real estate companies based on two types of underlying assets, commercial property income and supply chain debt, are relatively large. The scale of these two asset securitization products is CNY127.1 billion and CNY120.6 billion, respectively, and the stock balance is CNY127 billion and CNY119.3 billion, respectively. The asset securitization products issued as the underlying assets from the final payment for house purchase, property management fee income and housing rental income are relatively small in scale, CNY44 billion, CNY35.7 billion and CNY84.5 billion, respectively, and the stock balances are CNY44 billion, CNY34.9 billion and CNY83.4 billion. As shown in Annexes 4.13, the issuance scale of commercial property income and supply chain debt accounted for 60%, and the other three categories accounted for 40%. In

terms of the issuance scale, the overall issuance scale of asset-backed securitization products of real estate companies has continued to rise since 2015. As shown in Annexes 4.13, from 2015, the issuance scale accounted for 3% of the past year's full scale, and it increased year by year to 53% of the past year's full scale in 2018 (China Securities Regulatory Commission [CSRC], 2018). The continuous increase in the issuance scale reflects to a certain extent the dependence of real estate enterprises on financing through asset securitization. Also, it reflects the concentration of real estate enterprises' choice of channels for issuing asset securitization products. It can be seen from this that it is feasible to learn from the experience in the market for various types of asset securitization of real estate.

4.2.3 The underlying asset pool of real estate SMEs is suitable for securitization

By sorting out the ecological chain of real estate enterprises, we can find that five parts can generate cash flow. Including: commercial property operation income rights enjoyed by the provision of commercial property operation services; rental income rights enjoyed by the lessee for providing leasing services and under the lease contract; property management fees for providing property services and the right to charge according to the property contract; construction and trade payments made by upstream suppliers to real estate companies for contracting projects or providing goods and services, that is, accounts payable by real estate companies to upstream suppliers; real estate companies due to downstream sales of real estate; the final payment for house purchases. It can be seen that the underlying asset pool of asset securitization of real estate enterprises includes five main underlying assets, including commercial property operating income, rent, remaining mortgage, property management fee, and supply chain accounts payable, as shown in Figure 4.2.

1. Operating income 2. Rent 3. Property management fee
4. Remaining mortgage 5. Supply chain accounts payable
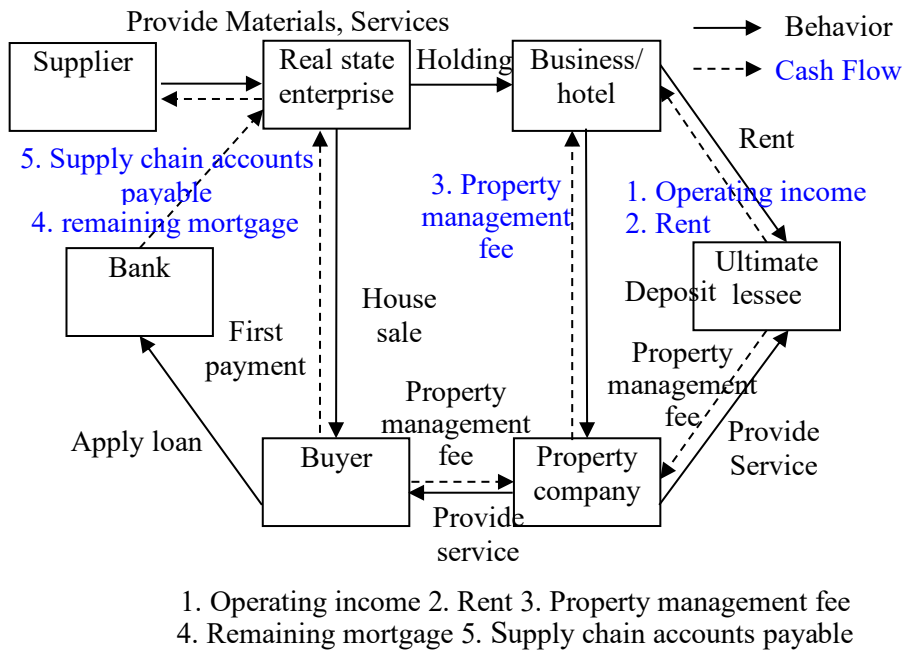
Figure 4.2 Ecological chain diagram of real estate SMEs in china

Source: Author finishing

Although the underlying assets of real estate SMEs are diverse, due to the limitation of corporate credit and scale, some underlying assets are not suitable for asset-backed securitization of real estate SMEs. For example, the accounts payable of suppliers in the underlying assets mainly rely on the main credit of the debtor, and the risks are highly concentrated. For another example, the final payment for house purchases in the underlying assets is usually set up for revolving purchases to ensure that high-quality, cash flow-guaranteed underlying assets for the final payment of house purchases can be continuously added to the pool. Therefore, the asset securitization scheme formed by these two underlying assets has the characteristics of solid credit subject, unstable cash flow and short duration. It cannot be applied to real estate SMEs with poor credit, face refinancing needs, and have high asset-liability ratio financing characteristics.

Commercial property income, rental income, and property management fees in the underlying assets refer to the operating income from property assets such as shopping malls, office buildings, logistics warehouses, and hotels. These property assets' operating income mainly includes rental income, venue rental income, parking space income, property management fee income, service fee income, and other income obtained from operating properties. For shopping malls, office buildings, logistics warehouses and other assets, income mainly comes from signing lease contracts with tenants and collecting rent and property management fees on schedule. Therefore, the stability of existing tenants and the ability to acquire new tenants determine the continuity and stability of cash flow.

Whether the real estate market is stable or not directly determines the continuity and stability of the cash flow generated by the above-mentioned underlying assets of real estate SMEs. In December 2018, the Central Economic Work Conference and the National Housing and Urban-Rural Construction Work Conference were held. The conference proposed that in addition to maintaining the strict control of the original policy, the real estate market should also achieve the "three stabilizing" goals of "stabilizing land prices, stabilizing house prices, and stabilizing expectations". The "three stabilizing" policy affects the real estate market, and the three critical indicators of urban leasing transaction price index, year-on-year growth rate and month-on-month growth rate have shown an overall upward trend (China real estate evaluation center, 2019). As shown in Annexes 4.14, China's urban leasing transaction price index has stopped falling and rebounded since December 2018. As of December 2019, China's urban leasing price index was 1043.7 points, an increase of 0.02% month-on-month and a year-on-year increase of 0.63%. China's urban rental price index and the month-on-month growth rate have risen for 12 consecutive months, and the year-on-year growth rate has shown a discontinuous and continuous upward trend (NBS, 2018c).

Sustained and stable rental income growth is the fundamental factor for the stable growth of property values. The continuous economic development of the city where commercial properties are located and the overall increase in land costs provide a necessary external environment for the growth of property rentals. As shown in Annexes 4.15, from September 2018 to July 2019, the average rent in 100 cities across the country increased slightly from CNY 26.58 /m²/month to CNY 26.8 /m²/month. The average rent of 100 cities in first-tier cities rose slightly from CNY75.47 /m²/month to CNY78.12 /m²/month. The average rent of 100 cities in second-tier cities rose slightly from CNY30.67 /m²/month to CNY 31.07 /m²/month. The average rent in 100 cities in third-tier cities dropped slightly from CNY21.34 /m²/month to CNY 21.3 /m²/month (NBS, 2019). The average rents in first- and second-tier cities far exceed the national and third-tier cities' average rents, and the month-on-month index of average rents in 100 cities also shows the same trend. Although the rental prices in different cities vary greatly, this difference is relatively stable. Comparing the rental prices and their trends in different cities, the average rental price in first-tier cities is the highest, followed by second-tier cities and third-tier cities. The difference between the highest and lowest rental prices is more than 3.5 times, and this difference is unchanged. Therefore, it shows that the city and region where the commercial property is located influences the trend of property rent and the stable and long-term property value growth.

For hotel-type assets, the potential earnings volatility may be higher due to the absence of

relatively long-term leases. Therefore, the hotel's average rent, historical rental rate, location (such as whether it is in a famous scenic spot or CBD), and occupancy structure (such as whether there are long-term bulk customers brought by business and tourism needs) determine the continuity and stability of cash flow. According to the National Statistical Bulletin of Star-rated Hotels by the Ministry of Culture and Tourism of China, star-rated hotels' average room price and average rental rate showed a steady upward trend from 2014 to 2018. Although there was a slight decrease in 2018, they all exceeded the average over the years. As shown in Annexes 4.16, the national average room rate of star-rated hotels increased from 333.08 yuan/night in 2013 to CNY356.34 /night in 2018; the national average rental rate of star-rated hotels increased from 55.97% in 2013 to 57.64% in 2018   (NBS, 2018d).

According to the statistics on the operating income of star-rated hotels from 2015 to 2018 in the National Star-rated Hotel Statistical Bulletin, it shows that four-star and five-star hotels account for 72.62% of the overall hotel operating income. Therefore, whether the cash flow of this part of the hotel assets is continuous and stable directly affects the feasibility of asset securitization. As shown in Annexes 4.17, from 2015 to 2018, the national average room rate of four-star hotels rose from CNY339.98 /night in 2015 to CNY353.59 /room night in 2018; the national average rental rate of four-star hotels increased from 55.28% in 2015 to 58.19% in 2018. The national average room price of five-star hotels rose from CNY655.66 per night in 2015 to CNY 685.73 per room night in 2018; five-star hotels' national average rental rate increased from 56.41% in 2015 to 62.05% in 2018. As a result, it shows that the average house price and average rental rate of four-star and five-star hotels show a continuous and steady upward trend as a whole (NBS, 2018a).

Property management fee refers to the property management service fee that the owner shall pay on time according to the agreement of the property service contract. Property service contracts are usually signed on an annual basis. Property service fees are generally charged by national laws, regulations, and administrative regulations within a reasonable range and according to the standards negotiated and confirmed by both parties. When a property management company signs a property service contract with the owner, the property service contract has been established and taken effect, that is, the primary legal relationship already exists. However, at this time, the property management company has not yet provided specific services, and the property service contract is a "dual-duty" contract. Only on the condition that the property management company subsequently provides property management services can the "contract debt" to the owner arise. In practice, the property service contract usually stipulates that the property management fee be charged in advance. According to the "2018

National Property Management Industry Development Report" released by the China Property Management Association, the national property management area is CNY24.665 billion square meters, with a compound growth rate of 12.01%. The operating income of the property management industry was CNY600.72 billion, with a compound growth rate of 13.66%. Therefore, as a "debt of the contract", the property management fee has the characteristics of continuous, stable, predictable, and independent.

Through the analysis of the above-mentioned underlying assets of real estate SMEs, it can be seen that the value of commercial property assets has not declined over time, showing that commercial property assets have good credit characteristics supported by securities repayment. At the same time, the three underlying assets of commercial property operating income, rental income, and property management fees are suitable for real estate SMEs to use for asset securitization because they have the common essential characteristics of stability and will continue to grow cash flow.

China has continuously imposed strict regulatory controls on the real estate industry in order to break away from its long-standing dependence on the industry for economic development and to prevent and control the resulting financial risks. In the economic background of China's strictly regulated and controlled real estate industry, it has become increasingly difficult for small and medium-sized real estate companies, which have long relied on bank loans, to obtain bank loans. As a result, small and medium-sized real estate companies must explore new channels of financing when they are unable to continue to obtain bank loans. As China vigorously promotes the reform of its financial system for direct financing, asset securitization is a financing method that not only meets the national policy requirements for the development of direct finance, but also satisfies the financing needs of small and medium-sized real estate companies. Therefore, for some small and medium-sized real estate companies with high-quality assets, they can rely on their specific high-quality assets rather than the credit of the company's subject to carry out asset securitization financing, thus exploring a direct financing channel that is in line with the direction of dual economic and financial reforms at the same time.

Chapter 5: Asset Securitization Program for Company A

5.1 Case study

5.1.1   Case introduction and data collection

Case introduction: The company A is a commercial complex of real estate project company. The commercial complex project is located in the core business district of Beijing. The enterprise A has three main types of assets including the shopping malls, hotels, and residences. Among them, the shopping malls and hotels are owned and operated by the company A while the residences are sold to the public. The total construction area is 136,000 square meters with 42 floors including the overground 38 floors and underground 4 floors. The shopping malls are located from the underground 1st floor to 6th floor (podium building), a five-star hotel from the overground 1st floor to 22nd floor (tower) and residences from 24th floor to 38th floor.

Company A, a typical small and medium-sized real estate company, has an asset composition that includes, in addition to residential properties, assets with continuous and stable cash flows such as commercial centers and hotels, and is large enough to be suitable for asset securitization. Therefore, I chose the shopping mall and hotel project of real estate company A as the object of research and conducts a case study. The time period is from 2017 to 2019. In addition, my work in the finance department of Company A has given me first-hand experience of the asset securitization of Company A's shopping mall and hotel. The experience makes it easier to summarize the asset securitization implemented in the shopping mall and hotel projects.

Our case study investigates the real-life situation of a small and medium-sized real estate company A to collect multiple data information on three types of underlying assets within the company including the shopping malls, hotels, and residences in a detailed and in-depth manner. The data information including taxes, asset securitization, real estate industry and bank loans is obtained from relevant appropriate bodies responsible for the real estate. Data acquisitions mainly includes the following:

(1) Data sources: The enterprise data comes from relevant departments of the enterprise, including the finance department, shopping malls, hotels, and sales department. The external data comes from the National Association of Financial Market Institutional Investors, the People's Bank of China, National Bureau of Statistics and State Taxation Administration.

(2) Data categories: revenue category, cost category, expense category, tax category, asset securitization category, real estate industry category and bank loan category.

(3) Time range: from 2017 to 2019

(4) Data collection process: Considering that I once worked in the finance department of the enterprise A, I could obtain the data of revenue category, cost category and expense category within the enterprise in the course of my work. Meanwhile, I could acquire the data of tax category, asset securitization category, real estate industry category and bank loan category outside the company through the daily operation and management of the enterprise.

Data sources are shown in Table 5.1.

Table 2.1 Data source table

NO.	Type	Data name	Data source
1	**Company data**	**Main Business Income**	**Company A Finance Department**
1.1	Company data	Rental income	Company A Shopping mall
1.2	Company data	Property management fee	Company A Shopping mall
1.3	Company data	Leased area	Company A Shopping mall
1.4	Company data	Occupancy rate	Company A Shopping mall
1.5	Company data	Rooms Revenue	Company A Hotel
1.6	Company data	Rentable rooms	Company A Hotel
1.7	Company data	Rooms Occupancy rate	Company A Hotel
1.8	Company data	F&B Revenue	Company A Hotel
1.9	Company data	Attendance rate	Company A Hotel
1.10	Company data	Proportion of accounts receivable	Company A Finance Department
2	**Company data**	**Main Business Cost**	**Company A Finance Department**
2.1	Company data	Shopping mall cost (SMC)	Company A Shopping mall
2.2	Company data	Hotel room cost (HMC)	Company A Hotel
2.3	Company data	F&B cost	Company A Hotel
2.4	Company data	Proportion of accounts payable	Company A Finance Department
3	**Company data**	**Expenses**	**Company A Finance Department**
3.1	Company data	Managing cost	Company A Finance Department
3.2	Company data	Marketing cost	Company A Finance Department
3.3	Company data	Financial cost	Company A Finance Department
4	**Tax data**	**Tax**	**Company A Finance Department**
4.1	Tax data	Value added tax	State Taxation Administration
4.2	Tax data	City tax	State Taxation Administration
4.3	Tax data	Education tax	State Taxation Administration
4.4	Tax data	Local tax	State Taxation Administration
4.5	Tax data	Flood control tax	State Taxation Administration
4.6	Tax data	Building Taxes	State Taxation Administration
5	**Asset securitization data**	**Asset securitization**	**National Association of Financial Market Institutional (NAFMII)**

删除了: 5

5.1	Asset securitization data	Reference financing cost of securitized products	NAFMII
5.2	Asset securitization data	Reference risk ratio of securitized products	NAFMII
5.3	Asset securitization data	Reference Tranches of securitized products	NAFMII

Source: Author finishing

5.1.2 Asset securitization framework

The fixed-ratio cash flow forecasting model is based on the financial planning model to review the historical financial data, determine the income statement and balance sheet accounts that have a linkage to the main business income accounts, and figure out the level at which each account maintains a fixed ratio to the main business income. Based on the forecast of the ratio of the main business income accounts to be adjusted upward in a certain period in the future, a hypothetical forecast is made for the accounts with linkage to main business income. The reconciliation of the difference between net income and cash flow is achieved through adjusting the relevant accounts in the income statement and balance sheet derived from the forecast.

The historical financial data is reviewed to determine the accounts in the balance sheet and income statement that maintain a fixed ratio to the main business income. And the main business income is predicted. As shown in Table 5.2:

Table 5.2 Accounting subjects that maintain a fixed proportion to main business income

No.	Accounting Subjects	Shopping mall	Hotel
1	Main Business Cost	Main Business Income	Main Business Income
2	Marketing cost	Main Business Income	Main Business Income
3	Managing cost	Main Business Income	Main Business Income
4	Property Tax（8.4%）	Main Business Income	Main Business Income
5	Accounts Receivable	Main Business Income	Main Business Income
6	Accounts Payable	Main Business Cost	Main Business Cost
7	VAT - output（6%）	Main Business Income	Main Business Income
8	VAT - Input（6%）	Main Business Cost	Main Business Cost
9	City tax（7%）	VAT - (output and input difference)	VAT - (output and input difference)
10	Education tax（3%）	VAT - (output and input difference)	VAT - (output and input difference)
11	Local tax（2%）	VAT - (output and input difference)	VAT - (output and input difference)
12	Flood control tax（1%）	VAT - (output and input difference)	VAT - (output and input difference)
13	Hotel room cost		Hotel Main Business Cost
14	Hotel F&B cost		Hotel Main Business Cost

Basis on defining the accounting subjects that maintain a fixed ratio with the main business

income, the cash flow is predicted according to the following steps. As shown in Table 5.3:

(1) Forecast primary business income. The data in 2019, determined the mechanism for increasing the primary business income.

(2) Hypothetical forecasts are made for the items in the profit and loss statement and the balance sheet that hold a fixed proportion to the central business income and the related subjects linked to the main business income.

(3) Make hypothetical forecasts for the subjects in the income statement and balance sheet that do not have a fixed proportion and linkage with the main business income and fill in the vacant subjects in the income statement and balance sheet.

(4) The accrual-based income statement and balance sheet are adjusted to the cash flow statement on a cash basis.

Table 5.3 Fixed ratio cash flow forecast parameters table

NO.	Accounting Subjects	Shopping mall	Hotel
1	**Main Business Income**	**Shopping mall Main Business Income（SMMBI）**	**Hotel Main Business Income (HMBI)**
1.1	Shopping mall Rent	Rental price × Leased area × Occupancy rate	
1.2	Shopping mall Property Fee	Property management fee × Occupancy rate	
1.3	Rooms Revenue		Rooms Revenue ×Rentable rooms ×Rooms Occupancy rate
1.4	F&B Revenue		F&B Revenue × Attendance rate
2	**- Main Business Cost (MBC)**	**SMMBI × SMC proportion**	**HMBI × HMC proportion**
3	**-Tax**	**Total tax**	**Total tax**
3.1	VAT (output and input difference)	SMMBI×VAT - SMC×VAT	HMBI×VAT - HMC×VAT
3.2	City tax	VAT (output and input difference) × 7%	VAT (output and input difference) × 7%
3.3	Education tax	VAT (output and input difference) × 3%	VAT (output and input difference) × 3%
3.4	Local tax	VAT (output and input difference) × 2%	VAT (output and input difference) × 2%
3.5	Flood control tax	VAT (output and input difference) × 1%	VAT (output and input difference) × 1%
4	Building Taxes	SMMBI × 8.4%	HMBI ×8.4%
5	- Marketing cost	SMMBI × Marketing cost proportion	HMBI ×Marketing cost proportion
6	- Managing cost	SMMBI ×Managing cost proportion	HMBI ×Managing cost proportion
7	Total Profits	Shopping mall total profits	Hotel total profits
8	- Income tax	Shopping mall total profits × 25%	Hotel total profits × 25%
9	**Net Profit**	**Shopping mall Net Profit**	**Hotel Net Profit**

The overall cash flow of the underlying asset pool is derived through forecasting the cash flow of the asset securitization project in the next five years. Based on the clarification of financing objectives, the means of bankruptcy remote, credit rating and enhancement, product stratification and repayment methods are selected in combination with the characteristics of the underlying assets and the practice of domestic asset securitization, so that the final asset securitization plan is derived. As is shown in Figure 5.1, the details include the following:

(1) The cash flow characteristics of three typical underlying assets of Company A, namely shopping malls, hotels, and residences, are analyzed based on historical data so as to screen out the underlying assets that meet the pooling criteria.

(2) The financing target is determined. The financing target is calculated based on the investment budget and the total capital requirement after the financing purpose is clarified and the financing project matches various conditions. The financing cost and risk ratio of the financing project are determined with the financing cost and sub-proportion of the enterprises and financing models with common attribute taken into consideration.

(3) The choice of tools for bankruptcy remote, credit rating and enhancement, product layering and repayment methods is determined based on clear financing objectives to obtain the asset securitization program.
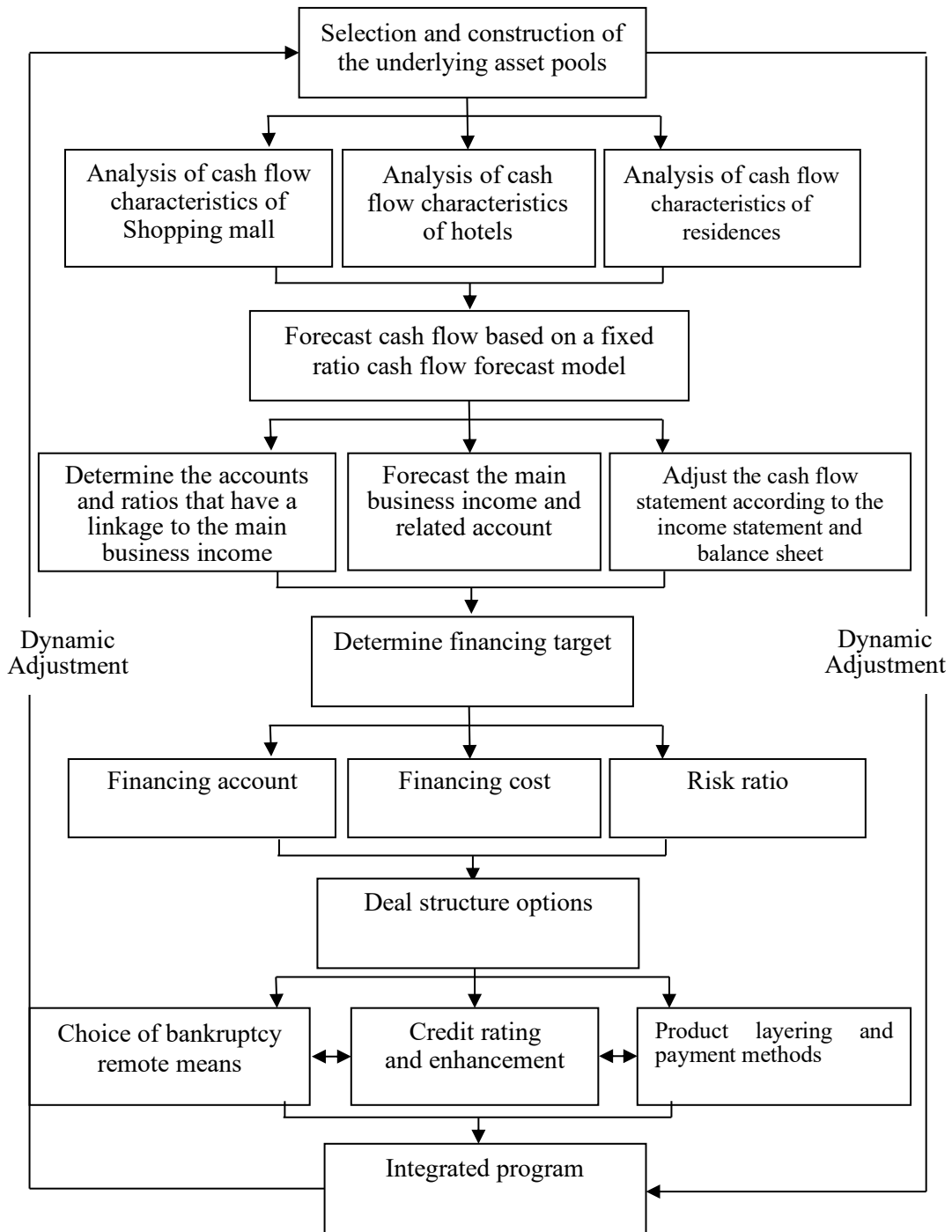
Figure 5.1 Framework of asset securitization program for small and medium-sized real estate enterprise

5.2 Underlying asset pool construction and cash flow forecast

5.2.1   Selection of inderlying asset

5.2.1.1   Basic principles

The core problem of asset securitization is many types of underlying assets in China's real estate SMEs. Therefore, how to choose the underlying assets is the key to building an asset pool. Further exploration, the core issue of building an underlying asset pool is whether the cash flow generated by the selected underlying assets is sustainable and stable. This article takes Company A as the subject of the case and takes the shopping mall and hotel project as the object of the asset securitization case. Based on historical data, analyze the cash flow characteristics of three typical underlying assets of company A's shopping mall, hotel, and residence. Then judge whether the three types of underlying assets meet the pool entry criteria, and whether the cash flow generated in the future can cover the cash flow principal and interest required by the unique scheme. Through the analysis of the cash flow characteristics of the three types of underlying assets, it can be seen that the cash flows of the two underlying assets of shopping malls and hotels are stable and continuous, while the primary residential assets do not have the above characteristics. In addition, the two underlying assets of shopping malls and hotels belong to the underlying assets of real estate income rights, and the asset portfolio has a negative risk correlation, which can realize internal hedging risks, thereby reducing the risk level of the entire asset portfolio. The underlying residential assets belong to the underlying assets of the creditor's rights for the final payment of the house purchase. They are limited by the method of sales collection, sales scale and sales stability. Therefore, the two underlying assets of shopping malls and hotels can be combined to build asset pools, and underlying residential assets are not suitable for building asset pools with the above two underlying assets. Based on above analysis, for the three types of typical underlying assets of real estate SMEs, in addition to satisfying legal compliance, clear ownership, and independence, underlying assets that meet the following cash flow characteristics of underlying assets should also be selected to form an asset pool:

Sustainability, stability, and predictability. The underlying assets can generate continuous and stable cash flow, which can be reasonably predicted based on the signed underlying contracts or based on historical data. Shopping malls and hotels lock future cash flows through leases among the three typical underlying assets of real estate SMEs, while residential cash flows are random. Therefore, when examining the three types of underlying assets, it is necessary to examine the stability of the underlying assets in the time dimension to infer the

future performance of the cash flow of the underlying assets. To investigate the stability of the asset's time dimension, it is necessary to evaluate the cycle of the asset's operation. The more complete the cycle, the more reliable the results obtained. The two underlying assets of shopping malls and hotels have leases and historical data performance, so they are stable in the time dimension. By adopting scientific forecasting methods, it is possible to forecast the future cash flow and other conditions of the two types of underlying assets and obtain relatively continuous and stable results. However, the underlying assets of the final payment for house purchases generated by the residential category cannot be accurately predicted. Therefore, shopping mall and underlying hotel assets have sustainability, stability and predictability. To investigate the stability of the time dimension of assets, it is necessary to evaluate the cycle of asset operation. The more complete the cycle is, the more reliable the result is.

Homogeneity and composability. Underlying assets have some common characteristics and substantial homogeneity, making them easier to combine and package. The two types of underlying assets of shopping malls and hotels are single or multiple original rights holders of the same property rights according to single or multiple basic contracts or fundamental legal relationships. These two underlying assets belong to the same type of property rights under the same underlying contract or underlying legal relationship. Furthermore, the two types of underlying assets are small, scattered, and have a low correlation between assets so that they can be combined into the same asset pool. However, the final payment for house purchases generated by residential assets cannot be packaged into the pool due to the lack of homogeneity and composability.

Size and duration matching. The total amount of cash flow generated by the underlying assets should match the total size of each asset securitization product. It should cover the interest and principal of each senior asset security in the asset securitization product. The asset pool of the three types of underlying assets typical of real estate SMEs must have a specific scale, on the one hand, to meet the requirements of asset securitization. On the other hand, it needs to dilute the total cost to reflect economies of scale. Moreover, the duration of the underlying assets should match the duration of the asset securitization product. Among the three typical types of underlying assets, two types of underlying assets, shopping mall and hotel, involve contracts, and the maturity dates of the underlying contracts are sufficiently dispersed. According to the underlying contract expiration date, amount and other factors, the scale of each asset-backed security can be accurately segmented, and the expected maturity date of the asset-backed securities can be determined. However, due to the time mismatch, the underlying assets of the final payment for house purchases generated by the residential category cannot

meet the conditions for entering the pool

5.2.1.2 Analysis on the characteristics of cash flow of all kinds of underlying assets

The analysis on the characteristics of cash flow of all kinds of underlying assets consists of three aspects:

(1) Shopping mall cash flow characteristics analysis

The cash flow structure of the shopping mall from 2017 to 2019 is shown in Annexes 5.1. With the gradual stabilization of hotel operations, guest rooms accounted for about 68% of the overall cash inflow from 2018 to 2019. Among the cash outflows from 2018 to 2019, cash outflows from operating activities accounted for about 87% of the overall cash outflows. In the past two years, the proportion of cash inflow and cash outflow has been stable. In absolute terms, cash inflows exceed cash outflows, indicating that cash inflows meet functional needs and have large surpluses.

The cash flow trend of shopping malls, as shown in Annexes 5.2, shows that the ratio of cash inflows and outflows from 2017 to 2019 has increased year by year. The compound growth rate of cash inflow is 3.52%, and the compound growth rate of cash outflow is -0.92%. It shows that the cash inflow has maintained strong growth with the gradual maturity and continuous improvement of operation and management. The loss of cash outflow due to running-in is decreasing, the trend is more sustainable and stable.

Shopping mall operating activity cash flow structure analysis. From 2017 to 2019, the cash inflow of the shopping mall increased year by year, and the cash outflow decreased year by year. From 2018 to 2019, cash outflow decreased from 53% to 52.1%, and net cash flow increased from 47% to 47.9%. The difference between the proportion of cash outflow and net cash flow remained within 1%, showing that the cash flow structure generated by the shopping mall's operating activities from 2018 to 2019 was sustainable and stable.

Shopping mall operating activity cash inflow structure analysis. As shown in Annexes 5.3, rental income and property fees accounted for approximately 84% and 16% of cash inflows from 2017 to 2019. The difference in the proportion of rental income and property fees in cash inflow remained within 1%.

As shown in Annexes 5.4, from the perspective of the composition of quarterly rental collections, the quarterly actual collection rates shown in the vertical direction did not reach 100%. The cumulative actual collection rate displayed horizontally is more than 100% since it includes outstanding payments and prepaid accounts. This shows a time mismatch between accounts receivable, and accounts received, which can lead to inconsistencies between capital

inflows and expected outflows. However, although accounts receivable will be in default and overdue, but in the case of a low loss rate, the accumulated overall cash inflow is continuous and stable.

For asset securitization products based on the rent of shopping malls, the stability of the lease determines the stability of the cash flow. However, commercial leases can be long or short, with tenants subletting, off-lease, cancellation, default or breach of contract, and tenants have the right to terminate the contract early. The occurrence of the above situation will cause a mismatch between the term of commercial asset securitization products and the term of the tenant's contract, which will expose asset securitization products to the risk of re-leasing, which will lead to inconsistencies between cash inflows and cash outflows. In addition, the more the number of re-leasing, the transaction cost will increase accordingly, which will reduce the net profit of rent. Therefore, whether the lease is stable or not directly affects the default degree of the asset pool. As shown in Annexes 5.5, from the perspective of the distribution of lease terms, by the end of 2018, the shopping mall had signed a total of 86 leases, with a diversified leasing customer base and lease terms ranging from 1 to 5 years. The 3-5 years lease term accounted for 78%, showing a stable distribution structure of leases. At the end of 2019, the shopping mall of Project A had a total of 86 tenants, with a leased area of 22,427 square meters and lease terms ranging from 1 year to 5 years. It is mainly divided into long-term tenants, renewal tenants, and new tenants. As shown in Annexes 5.6, there are 33 long-term tenants, and this type of tenants is the tenants that have survived from the opening until the end of 2019. The lease area and rent of such tenants accounted for 89% and 82% of the shopping mall. There are 14 lease renewal tenants, such tenants are customers of long-term tenants who continue to lease the leased shops after the lease expires. Such tenants' lease area and rent account for 2% and 4% of the shopping mall, respectively. There are 39 new tenants, who are re-signing tenants after they have resigned. Such tenants' lease area and rent account for 8% and 13% of the shopping mall, respectively. The lease term distribution table shows that the length of the lease reflects the stability of different types of customers, which in turn affects the stability of rental income. All long-term tenants have a lease term of more than 4 years, showing their strong stability. Such customers account for a large proportion in both area and rental amount. Therefore, the stability of such tenants directly affects the stability of the net cash flow of the shopping mall. In addition, the duration of such tenants' existence also shows their recognition and satisfaction with the operating results achieved in the leased land. The lease term of renewal customers is relatively scattered, and the proportion of both area and rent is small. However, whether such tenants are willing to renew their leases reflects their prejudgment of whether they can benefit from the

shopping mall in the future and their recognition of their management. The lease terms of new tenants are mainly concentrated between 1 and 3 years. The number of such tenants is relatively large, and they mainly lease some smaller rental areas. Such tenants are generally less able to bear economic pressure, and fluctuations in rents or the stability of their income will lead to changes in the leases of such tenants. Therefore, the stability of this type of tenant is slightly less, and the rental exchange rate is higher. Such tenants are often the main body with unstable cash flow of the underlying assets.

Shopping mall operating activity cash outflow structure analysis. As shown in Annexes 5.7, from 2017 to 2019, the cash paid by the shopping mall for purchasing goods, receiving labor services, and paying to and for employees accounted for 35% to 36% of the cash outflow from operating activities. Taxes and fees have increased significantly with operating income and total profit after making up for losses. Other expenses gradually decline as commercial operations mature. This cash outflow structure conforms to the general law of the development of shopping malls.

Shopping mall operating activity cash flow trend analysis. A Shopping mall has the characteristics that the higher the economic level of the location, the stronger the income stability, and the higher the asset evaluation value. Company A's Shopping mall is located in the core business district of Beijing, where the region is prosperous, and the economic environment is more favorable, which is in line with the above characteristics. As shown in Annexes 5.8, the compound growth rate of cash inflow from operating activities is 3.52%, the compound growth rate of cash outflow from operating activities is -1.32%, and the compound growth rate of net cash flow is 10.06%. From 2017 to 2019, the cash inflow and outflow ratio increased from 1.43 to 1.80. In 2018 and 2019, EBITDA increased by 228% and 45% year-on-year. The results show that the shopping mall has continuous and stable operating cash flow and has strong profitability.

Shopping mall operating activity cash inflow trend analysis. As shown in Annexes 5.9, from 2017 to 2019, the gap between primary business income and cash inflow from operating activities gradually narrowed, and the annual cumulative collection rate increased from 95.3% to 98.2%. The results show that the management and recovery of accounts receivable in the shopping mall are effective, and the main business income and current assets are good. The structure of main business income and cash inflow from operating activities is stable.

As shown in Annexes 5.10, from the perspective of the current month of rent collection, the rental collection mode of the shopping mall of Project A is "deposit three months and pay one month." Affected by overdue payment, the monthly rent collection rate is low. But over

time, the cumulative rental collection rates across cycles have continued to rise. Rent collection rates are significant for real estate SMEs. This is because real estate SMEs do not sign tenants with financial strength and stable leases, unlike central enterprises or large real estate enterprises. Most of the tenants faced by real estate SMEs are with specific strength or even average strength. Therefore, after the shopping mall is leased out, whether the rent can be recovered, and how much rent can be recovered, it shows the Shopping mall's risk control and operation management level. Since the rent collection rate reflects the recovery degree of accounts receivable, it directly affects the cash flow, so its size changes greatly impact the cash flow stability. The individual choices of tenants can lead to overdue, default or loss uncertainty in rental collections. During 2017-2018, the monthly rent collection rate fluctuated the most, ranging from 34.69% to 92.25%. Over time, the 6-month cumulative rental collection rate fluctuations narrowed to between 84.72% and 97.33%. The 12-month cumulative rent collection rate fluctuation range narrowed to between 91.58% and 98.63%. Therefore, it shows that the rental collection rate for more than 6 months is continuous and stable, the default probability is small, and the loss rate of rental collection is meager. Moreover, even if the tenant defaults, because there is a 3-month deposit, it will make up for the loss of rent caused by the default.

From the perspective of the actual collection of rent collection, the actual rent received in the current month consists of three parts: accounts receivable attributable to this month, accounts receivable that are overdue and recovered and received in advance in the coming months. From this perspective, the accounts receivable recovered this month have a corresponding relationship with the primary business income accrued in this month, showing the actual collection ratio of the main business income in the current month. The rental income of the commercial segment has differences in the amount due to timing differences and lease breaches between profit on an accrual basis and cash flow on a cash basis. Profits will be based on the principle of accrual basis, and all signed lease contracts will be accrued as main business income according to the contract amount, regardless of whether the rent has been received or not. The cash flow statement will, following the cash basis principle, include the rent received in the current month into the operating cash inflow, regardless of whether the rent received belongs to the current month or not. As shown in Annexes 5.11, the table column shows the months in which the accounts receivable corresponding to the main business income of this month were received. The horizontal line indicates which months of rent are included in the actual rent received this month. Taking July as an example, the 3.64 million in the dotted box is the amount received in July and belongs to the primary business income of the month. The

shaded part in the column is that the accounts receivable corresponding to the primary business income of the current month is 10.18 million, and the accounts receivable that are received this month and before this month are 5.24 million. The other accounts receivable of 4.94 million were received in the next five months, so the actual proportion of accounts receivable in July was 51%. The rampant reflects the actual receipt of 9.73 million in July. Among them, the accounts receivable attributable to July was 3.64 million, the overdue accounts receivable belonging to March to June was 3.91 million, and the advance accounts belonging to August was 2.19 million. The annual cumulative accounts receivable collection rate was 89%. The timing mismatch between the accounts receivable and actual accounts received corresponding to the central business income will lead to inconsistency between the inflow and the expected outflow of funds. From the overall perspective of the year, although the accounts receivable corresponding to the primary business income of each month will be overdue, the loss rate is meager. Therefore, the overall cash flow is continuous and stable.

Shopping mall operating activity cash outflow trend analysis. As shown in Annexes 5.12, from 2017 to 2019, the main business cost and cash outflow from operating activities changed from relatively large fluctuations in the early stage to stable in the later period, and the difference in volatility gradually narrowed. The annual cumulative payment rate from 2017 to 2019 increased from 96% to 100%. The results show that the shopping mall accounts payable management and payment cycle arrangements are appropriate. The main business cost and cash outflow structure from operating activities are stable.

(2) Hotel asset cash flow characteristics analysis

Hotel overall cash flow characteristics analysis

The cash flow structure of the hotel from 2017 to 2019, as shown in Annexes 5.13, room rent accounted for about 84% of the overall cash inflow, and cash outflow from operating activities accounted for about 76% of the overall cash outflow. The proportion of cash inflow and cash outflow was stable in the three years. In absolute terms, cash inflows and cash outflows are basically the same.

The hotel cash flow trends are shown in Annexes 5.14. From 2017 to 2019, the ratio of cash inflow and outflow increased year by year, the compound growth rate of cash inflow was 8.43%, and the compound growth rate of cash outflow was 6.31%. It shows that the cash flow has maintained continuity and stability in the trend.

Hotel operating activity cash flow structure analysis. From 2017 to 2019, hotel cash inflow increased year by year, while cash outflow decreased yearly. As shown in Annexes 5.15, the cash outflow from 2018 to 2019 decreased from 89.8% to 88.5%, and the net cash flow

increased from 10.2% to 11.5%. The difference in the proportion of cash outflows and net cash flows remained within 2%, showing that the cash flow structure generated by hotel operating activities from 2018 to 2019 was sustainable and stable. The hotel industry is a labor-intensive industry, and costs account for a large proportion of various indicators. Therefore, it is imperative to grasp the payment rhythm of costs to stabilize the hotel's operating cash outflow. The control of cost payment rhythm mainly includes two parts: cash payment ratio control and payment period control. From 2017 to 2019, the cost structure of hotels was stable, with room cost and hotel cost stable at 6:4. Accounts payable accounted for 11.7%, 13.5% and 10.9% of leading business costs from 2017 to 2019, respectively, with maximum average volatility of 2.6% over the three years. The stability of the cost structure and the cash payment ratio provides a solid foundation for reducing the volatility of cash payment.

Hotel operating activity cash inflow trend analysis. As shown in Annexes 5.16, with the gradual maturity of hotel operations, room rental cash inflows in 2018 increased significantly. From 2018 to 2019, room revenue and catering accounted for approximately 68% and 32% of cash inflows. The difference in the proportion of guest rooms and catering in cash inflow remained within 2%.

As shown in Annexes 5.17, from the hotel's customer source composition, hotel source business customer income accounts for the most significant proportion of total income. This is because the hotel is located in the embassy area, and many embassies choose to sign the hotel for foreign affairs activities due to the hotel's convenient transportation and quality advantages. However, because the contract price of this type of customer source will be lower than the listed price, and there will be more restrictive terms, which will reduce other customer sources, the proportion of this type of customer source will be slightly controlled in 2019. With the gradual popularity of the personal travel market, individual tourists and other sources of tourists ranked second in the proportion of tourists, and in 2019, there was a significant increase in this type of tourist. Since this type of customer source is an essential object for increasing the unit price of hotel guests, this type of customer source has a more significant impact on the increase of hotel revenue. The number of conference visitors and tourism teams both increased and decreased slightly in 2018 and 2019, in line with development expectations. It can be seen from the above that the primary source of hotel guests has a certain degree of dispersion while maintaining stability.

Hotel operating activity cash outflow trend analysis. As shown in Annexes 5.18, from 2017 to 2019, the hotel purchased goods, received labor services, paid related fees and taxes to employees accounted for 63% to 65% of the total cash outflow. Other expenses gradually

decreased with the gradual increase in the maturity of hotel operations. The cash outflow structure is in line with the general laws of hotel development. As shown in Annexes 5.19, from the perspective of the cost structure of hotels, the cost of hotel rooms and hotel costs stabilized at 6:4 from 2017 to 2019. Accounts payable accounted for 11.7%, 13.5% and 10.9% of leading business costs from 2017 to 2019, respectively, with maximum average volatility of 2.6% over the three years. The stability of the cost structure and the cash payment ratio provides a solid foundation for reducing the volatility of cash payment.

Hotel operating activity cash flow trend analysis. As one of the substantial sub-sectors of the tourism industry, the hotel industry's cash inflow is highly correlated with tourism consumption. In addition, the hotel has the dual attributes of heavy asset operation and labor-intensive operation so that the hotel operation will have higher cash outflows in terms of costs and expenses. The hotel of Company A is located in the embassy district of Beijing's core business district. As shown in Annexes 5.20, the compound growth rate of cash inflow from operating activities is 8.43%, the compound growth rate of cash outflow from operating activities is -7.14%, and the compound growth rate of net cash flow is 20.91%. From 2017 to 2019, the cash inflow and outflow ratio increased from 1.09 to 1.13. This shows that the hotel has a strong cash flow balance.

As shown in Annexes 5.21, in terms of the accounts payable period, the ratio of payment periods of 30 days and 60 days continued to increase, and the rates of payment periods of 90 days and more than 120 days continued to decline over the 18 months. With the maturity of the hotel operation, based on maintaining a certain number of accounts payable, we will continue to optimize the period and structure of accounts payable through the acceleration of capital receipt and payment turnover. In this way, the payment rhythm is more orderly, controllable, and reduces costs.

Hotel operating activity cash inflow trend analysis. As shown in Annexes 5.22, from 2017 to 2019, the hotel's central business income and cash inflow from operating activities maintained a small gap. The annual accumulative collection rate exceeds 100%, mainly due to the formation of advance accounts. The data shows that the hotel's accounts receivable management and recovery work is vital, and the quality of main business income and current assets is good. The structure of primary business income and cash inflow from operating activities is stable.

As shown in Annexes 5.23, judging from the trend of hotel rental rate, company A's hotel rental rate and revenue from 2017 to 2019 changed in the same direction, and the annual average rental rate in 2018 and 2019 was stable at around 62%. The cyclical nature of the tourism

industry makes the hotel rental rate clearly distinguish between low and high seasons. There are apparent fluctuations in the rental rate in the off-season of domestic tourism before and after the Spring Festival and the peak season of tourism before and after the National Day. In particular, the A project hotel is still in the incubation period. From a demand perspective, an excessively high rental rate will reduce the customer experience, resulting in demand overflow; from a cost perspective, an excessively high rental rate is like a long-term overloaded machine, which will accelerate the loss of the hotel's fixed assets. Therefore, the A project hotel did not blindly increase the rental rate. Based on maintaining a stable rental rate, the total revenue for two years has increased by 13.09% and 2.08% respectively, by increasing the unit price of the room.

As shown in Annexes 5.24, from 2017 to 2019, the prices of ADR (ADR, Average Daily Rate) and RevPAR (RevPAR, Revenue Per Available Room) will fluctuate with the low and peak seasons they are all in a steady upward trend. ADR and RevPAR increased by 2.08% and 1.73%, respectively, during the same period in 2019. The gradual increase in RevPAR also shows that there is still potential to be tapped in the rental rate and average house price, both of which have been steadily increasing year after year.

Hotel operating activity cash outflow trend analysis. As shown in Annexes 5.25, from 2017 to 2019, the volatility difference between the cost of prominent business and cash outflow from operating activities gradually narrowed. The primary purpose is to reduce the cost and change the payment method from credit sales to prepayment. As a result, the annual cumulative payment rate from 2017 to 2019 increased from 82% to 104%. This shows that based on ensuring the stability of the central business cost and cash outflow structure of operating activities, the hotel further enhances the profit margin by reasonably arranging the accounts payable management and payment cycle.

(3) Residential asset cash flow characteristics analysis

Residential cash flow structure in 2019, as shown in Annexes 5.26, cash inflow consists of sales of houses and interest income. Among the cash outflows, cash flows from operating activities accounted for 25%, and cash flows from financing activities accounted for 74.9%. Most of the funds in the development and construction stage of real estate enterprises will use bank development loans. After the transfer to the delivery stage, the main body of principal and interest repayment will be the residence with the characteristics of rapid realization. However, due to the uncontrollable rhythm of residential sales, the number of house sales and debt repayment cannot be completely matched. Therefore, the cash flow structure of residential houses is not stable.

The trend of residential cash flow, as shown in Annexes 5.27, shows a dangerous downward trend in the cash inflow and outflow ratio from 2017 to 2019. The compound growth rate of cash inflow is 13.74%, and the compound growth rate of cash outflow is 18.23%. Due to the small saleable volume and the unstable average price of residential buildings and the impact of policy regulation and market supply and demand fluctuations, the sales volume from 2017 to 2019 was irregular, and the sales unit price fluctuated greatly. The data shows that the cash flow of underlying residential assets is not sustainable and stable.

5.2.1.3 Various underlying assets operating cash flow key influencing factors

The analysis of key influencing factors include:

(1) Shopping mall operating cash flow key influencing factors

Rental growth rate. The growth rate of rental income is an important indicator to test the continuity and stability of the cash flow of a shopping mall. The length of leases and the proportion of rents of different tenants affect the continuation and stability of the growth rate of rental income. As shown in Annexes 5.28, long-term tenants leases are long and stable. Under normal circumstances, the rent of such tenants will not increase significantly within three years, and the rent will be increased in the fourth year. Renewing tenants and new tenants have short and unstable leases. To make up for the losses caused by the rental gap and refer to the rent increase of the surrounding shopping malls, the rent of such tenants will increase significantly every year. In addition, according to the general rules of Shopping mall operation, the first four years after opening is the incubation period. During this period, to ensure the lease's stability, the rental growth rate will be lower than that in the development period and mature period. Before 2018, the shopping mall of Company A belonged to the three-year lease period of long-term tenants. Also, it belonged to the cultivation period, so the rental growth rate was relatively low. Different types of tenants will increase the rent to varying degrees due to the proportion of rent, the length of the lease, and the year of signing. Long-term tenants have long leases. Generally, the rent will not increase significantly in the first two years of the lease according to the end of the contract, but the rent will be increased from the third year. In addition, in the initial stage of investment promotion, to stabilize such tenants, the overall rent increase rate is lower than that of renewal tenants and new tenants, so the proportion of rent of such tenants will show a downward trend year by year. Renewal tenant rents accounted for a small proportion but were more evenly distributed across the years. This type of tenants agrees to renew the lease, which means that they recognize the operating results in the leased area, so even if the rent increases to a certain extent, they agree. New tenants are second only to long-term tenants in

terms of the proportion of the rent. An important aspect that distinguishes this type of tenant from other types of tenants is a lease gap. The length of the lease gap period means how much rent is lost. Due to the instability of the tenancy agreement and the consideration of making up for the loss of the lease period and referring to the rent increase of the surrounding shopping malls, the rent of this type of tenants will increase significantly, and the proportion of rent will show an upward trend year by year.

Differences in the location of different cities and shopping malls will cause significant differences in average rents. For example, Beijing, where the shopping mall of Company A is located, has seen a continuous rise in commercial rents since the sharp rise in rents in 2012. In particular, the essential business districts in Beijing, such as the "San Li tun," "Zhong Guan Cun," and "Xi Dan" commercial area, lead the rental levels of various business districts in Beijing. As shown in Annexes 5.29, the rent range for the best location on the first floor of the "San Li Tun" business district where Company A's Shopping mall is located is CNY1,500-2,800 /m²/month. The average monthly rent of the best location on the first floor of the shopping mall of Company A is CNY957 /m²/month. There is a big gap, compared with the minimum rent standard of CNY 1,500 /m²/month for the best location on the first floor of the "San Li Tun" business district. This shows that there is still much room for growth and adjustment in the rent of company A's Shopping mall.

Rental rate. The rental rate is an important indicator to test the credit quality of the underlying assets of a shopping mall. From the perspective of overall rent stability, its importance even exceeds the average rent and its rate of increase. Not only that, the overall economic environment and the degree of industry prosperity will affect the rental rate. Moreover, whether the lease can be renewed or replaced after it expires will also affect the rental rate. As shown in Annexes 5.30, as of the end of 2019, a total of 86 leases were signed for the shopping mall. Apart from a drop in the rental rate due to tenant defaults from July 2017 to March 2018, the shopping mall rental rate has remained above 98% since March 2018. The area ratio, rent ratio and industry dispersion of core tenants are important reference indicators for examining the dispersion of cash flow risks of underlying assets. There are six tenants with a leased area of more than 1,000 square meters, with a leased area of 13,512 square meters, accounting for 60.2% of the overall leased area. The rent was CNY 5,423,882, accounting for 53.26% of the overall rent. The six tenants are leading companies or well-known companies in different industries, and their ability to pay rent and perform contracts is guaranteed. Therefore, it shows that more than 60% of the leased area in the shopping mall is leased to a few core tenants with a significant degree of dispersion, which accounts for more than 53% of the rent,

so the rent of core customers has strong stability.

(2) Hotel operating cash flow key influencing factors

ADR and RevPAR. The Average Daily Rate (ADR) and the Revenue Per Available Room (RevPAR) are two important indicators to measure the hotel's functional level and return on investment. Unlike RevPAR, ADR averages actual revenue from rooms sold to reflect hotel room operating earnings accurately. As shown in Annexes 5.31, from 2017 to 2019, the prices of ADR and RevPAR will fluctuate with the low and peak seasons, but they are all rising steadily. In 2019, the compound growth rate of ADR and RevPAR was 4.9% and 11.3%. The gradual increase of the two indicators, combined with the continuous increase in occupancy rate, shows that room rent still can be tapped.

Hotel occupancy rate. The Average Daily Rate (ADR) and the Revenue Per Available Room (RevPAR) are two important indicators to measure the hotel's functional level and return on investment. Unlike RevPAR, ADR averages actual revenue from rooms sold to reflect hotel room operating earnings accurately. As shown in Annexes 5.31, from 2017 to 2019, the prices of ADR and RevPAR will fluctuate with the low and peak seasons, but they are all rising steadily. In 2019, the compound growth rate of ADR and RevPAR was 4.9% and 11.3%. The gradual increase of the two indicators, combined with the continuous increase in occupancy rate, shows that room rent can still be tapped.

(3) Conclusion

By analyzing the cash flow characteristics of the two underlying assets of shopping malls and hotels and analyzing the key factors affecting the cash flow of operating activities, we can draw the following conclusions. The two underlying assets of shopping malls and hotels are sustainable and stable in the cash flow structure and trend. Furthermore, we can confirm that the two underlying assets also have continuity and stability in the structure and trend of assets and liabilities and profit and loss. Therefore, it can be concluded as follows:

The structure of cash inflow and cash outflow from operating activities and the growth rate of key influencing factors are shown in Table 5.4:

Table 5.4 2017 - 2019 Cash inflow & outflow structure and key influencing factors growth rate

Subject	Item	Shopping mall	Hotel
Cash Inflow	Rent	83%	
	Property Fee	17%	
	Guest Room		68%
	Food		32%
Cash Outflow	Goods and Labor Fee	27%	30%
	Pay Employee Related Expenses	8%	20%
	Taxes	37%	15%

	Other Expenses	29%	36%
Growth Indicator	Rental Unit Price Growth Rate	5%-10%	
	Occupancy Rate Growth	0.1%-0.3%	
	ADR and Food Growth Rate		2%-5%
	Occupancy Rate Growth		1%-3%

5.2.2   Asset pool cash flow forecast

The method of asset pool cash flow forecasting: The cash flow forecasting of the asset pool is realized by constructing a financial planning model based on the fixed-proportion growth method. Such financial planning is usually embodied in quantitative models derived from financial statements.

The idea of asset pool cash flow forecasting:

(1) Review three years of historical financial data to determine which items in the income statement and balance sheet are linked to the central business income account and at what level the ratio is maintained. Then forecast based on the expected main business income subject. If there is no fixed proportional relationship with the main business income subject, it needs to be predicted on other bases.

(2) Forecast primary business income. The data in 2019, determined the mechanism for increasing the primary business income.

(3) Hypothetical forecasts are made for the items in the profit and loss statement and the balance sheet that hold a fixed proportion to the central business income and the related subjects linked to the main business income. Different subjects need to calculate the corresponding subject amount based on different calculations. First, forecast the main business cost, sales expenses, management expenses, property tax and accounts receivable of various underlying assets that hold a fixed proportion to the main business income. Second, forecast the subjects that maintain a fixed proportion to VAT and main business costs. Value-added tax-output tax is calculated based on main business income, and value-added tax-input tax is calculated based on main business cost. The difference between output tax and input tax is the basis for calculating additional tax.

(4) Make hypothetical forecasts for the subjects in the income statement and balance sheet that do not have a fixed proportion and linkage with the main business income and fill in the vacant subjects in the income statement and balance sheet.

(5) Combine the income statement and balance sheet to adjust the cash flow statement. The income statement is based on an accrual basis and the cash flow statement is based on a cash basis. To derive specific data on cash flow, it is necessary to adjust several accounting subjects

to adjust the difference between net profit and cash flow. For example, analyze the difference between the net profit and cash flow of the four subjects of accumulated depreciation, accounts payable, accounts receivable, and taxes payable.

Referring above data, the balance sheet and income statement of the shopping mall and hotel forecast for 2020 to 2024 can be calculated. The predicted cash flow statement for shopping malls and hotels from 2020 to 2024 can be derived by adjusting the relevant items. As shown in Table 5.5:

Table 5.5 2020 - 2024 Cash flow statement forecast (unit: ten thousand yuan)

Accounting Subjects	2020	2021	2022	2023	2024
Operating Activities Cash Flow					
Net Profit	3,388	3,653	6,631	6,838	7,053
+Depreciation	+5,935	+5,935	+5,935	+5,935	+5,935
- Accounts Receivable Increase	+ 40	+ 63	+ 67	+ 30	+ 31
+ Accounts Payable Increase	- 507	+ 59	- 15	+ 29	+ 30
+ Tax Payable Increase	+ 24	+ 13	+ 14	+ 7	+ 7
Total Operating Activities Cash Flow	+8,799	+9,598	+12,497	+12,778	+12,993
Cash Flow from Investing Activities	+0	+0	+0	+0	+0
Cash Flows from Financing Activities	+0	+0	+0	+0	+0
Net Increase in Gold and Cash Equivalents	**8,799**	**9,598**	**12,497**	**12,778**	**12,993**

5.2.2.1 Shopping mall

First, review the three-year historical financial data to determine which subjects in the income statement and balance sheet are linked to the main business income item and the ratio level. As shown in Table 5.6:

Table 5.6 Accounting subjects that maintain a fixed proportion of shopping mall and main business income

No.	Accounting Subjects	Calculation Basis	2017	2018	2019
1	Main Business Cost	Main Business Income	36.6%	35.1%	32.5%
2	Operating Expense	Main Business Income	5.8%	5.9%	5.6%
3	Management Fee	Main Business Income	21.1%	16.1%	11.4%
4	Building Taxes	Main Business Income	8.4%	8.4%	8.4%
5	Accounts Receivable	Main Business Income	4.2%	3.7%	4.1%
6	Accounts Payable	Main Business Cost	0.7%	0.9%	0.8%
7	VAT - output	Main Business Income	6%	6%	6%
8	VAT - Input	Main Business Cost	35%*6%	35%*6%	35%*6%
9	City tax	VAT - (output and input difference)	7%	7%	7%
10	Education tax	VAT - (output and input difference)	3%	3%	3%
11	Local tax	VAT - (output and input difference)	2%	2%	2%
12	Flood control tax	VAT - (output and input difference)	1%	1%	1%

Second, forecast the main business income. Based on the data in 2019, the mechanism for increasing the main business income will be determined. As shown in Annexes 5.33.

One of the critical factors affecting the cash flow of shopping malls in the rental growth rate. Based on Cushman & Wakefield's "Beijing Retail Market Report for the First Quarter of 2019", the forecast on the future trend of rents and the rent spreads in surrounding shopping malls are the basis. Assuming the future growth rate of shopping mall rent and property fees, the average value is 7.5% in the first to third years, and 3% in the fourth and fifth years.

Another critical factor affecting the cash flow of shopping malls in the rental rate. According to the analysis of Cushman & Wakefield's "Beijing Retail Market Report in the Fourth Quarter of 2019" and "New Opportunities in China's Commercial Real Estate Market", with the slowdown in the supply of shopping malls in core business districts and the renovation of projects, the vacancy rate in core business districts will further decrease. Therefore, it is assumed that the growth rate of the rental rate of the shopping mall in the future will be an average of 0.23% in the first to third years, and 0.15% in the fourth and fifth years.

Based on the above assumptions, the main business income subjects in 2020 are predicted, and the forecast results are shown in Annexes 5.34.

Third, forecast the items in the profit and loss statement and the balance sheet that are assumed to hold a fixed proportion to the primary business income and related subjects linked to the primary business income. It can be seen from the above analysis that the shopping mall of Company A is still in the incubation period of 1-4 years and has not yet reached the mature stage of operation, so there is still much room for improvement in cost and expense control. As a conservative estimate, 2020-2021 costs and expenses are the same as 2019. Starting from 2022, the main business cost, sales expenses, and management expenses will be reduced by 3%, 1%, and 1%, respectively. Other subjects will still maintain the proportions in 2019 and be adjusted in conjunction.

Based on the above assumptions, the relevant subjects are predicted, and the prediction results are shown in Annexes 5.35.

Fourth, make hypothetical forecasts for the subjects in the income statement and balance sheet with no fixed proportion and linkage with the primary business income. Fill in the vacant subjects in the income statement and balance sheet. We assume that the annual depreciation amount remains a fixed accrual amount every year, and other payables and paid-in capital have not changed. According to the above assumptions, the Shopping mall's balance sheet and income statement for 2020 can be obtained.

Fifth, adjust the cash flow statement by combining the income statement and the balance

sheet. As shown in Annexes 5.36.

The first accounting subject is the increased depreciation expense of CNY21.49 million in 2020. Depreciation is a non-cash expense deducted in the calculation of net profit. The depreciation expense of the shopping mall is calculated by dividing the real estate development cost according to the apportioned area of the shopping mall after the completion and delivery of various buildings and calculated by the straight-line method according to the depreciation period. Depreciation expense is recognized as an expense in each month of the depreciation period. In fact, the construction cost has been paid in cash during the construction process. Therefore, the depreciation expense needs to be added back to the net profit to obtain the cash flow from operating activities. The vast amount of accumulated depreciation in shopping malls and hotels shows the asset-heavy operational nature of the two types of underlying assets and reflects the massive impact of depreciation on profits and operating cash flow.

The second accounting subject was the increased accounts receivable of CNY340,000 in 2020. This is the difference between the recognized main business income and the actual cash received during the year. The main business income of CNY150.4 million in the income statement means that this amount of goods and services will be transferred to and paid for by consumers, however, only CNY150.06 million was received in cash. Therefore, to get the cash flow from operating activities from the net profit, the increase in accounts receivable of CNY 340,000 needs to be subtracted.

The third accounting subject is the accounts payable of CNY790,000 yuan, reduced in 2020. This is the difference between the recognized principal operating costs for the year and the actual cash. The main business cost of CNY48.92 million yuan in the income statement means that all main business costs have been deducted in calculating net profit. However, CNY49.71 million yuan was actually paid in cash. Therefore, to obtain the cash flow from operating activities from the net profit, the increase in accounts payable of CNY790,000 subject needs to be reduced.

The fourth accounting subject was the additional tax payable of CNY150,000 in 2020. This is the part of the output VAT payable but not paid in December this year. Due to the nature of the value-added tax, it is an extra-price tax and a turnover tax, so it is not reflected in the income statement. The income and expenditure of VAT output tax and input tax are reflected in the cash flow statement, and the difference between the two is reflected in the "tax payable" item of the balance sheet. Therefore, to obtain the cash flow from operating activities from the net profit, the tax payable of CNY150,000 needs to be added back.

5.2.2.2 Hotel

First, review the three-year historical financial data to determine which subjects in the income statement and balance sheet are linked to the main business income item, and at what level the ratio is maintained. As shown in Table 5.7:

Table 5.7 Accounting subjects that maintain a fixed proportion of hotel and main business income

No.	Accounting Subjects	Calculation Basis	2017	2018	2019
1	Main Business Cost	Main Business Income	67.9%	62.8%	59.1%
2	Operating Expense	Main Business Income	9.3%	9.6%	9.2%
3	Management Fee	Main Business Income	39.0%	31.1%	29.3%
4	Building Taxes	Main Business Income	8.4%	8.4%	8.4%
5	Accounts Receivable	Main Business Income	0.7%	0.8%	1.0%
6	Accounts Payable	Main Business Cost	8.0%	8.5%	6.5%
7	VAT - output	Main Business Income	6%	6%	6%
8	VAT - Input	Main Business Cost	60%*6%	60%*6%	60%*6%
9	City tax	VAT - (output and input difference)	7%	7%	7%
10	Education tax	VAT - (output and input difference)	3%	3%	3%
11	Local tax	VAT - (output and input difference)	2%	2%	2%
12	Flood control tax	VAT - (output and input difference)	1%	1%	1%

Second, forecast the main business income. Based on the data in 2019, the mechanism for increasing the main business income will be determined. As shown in Annexes 5.37.

One of the key factors affecting hotel cash flow is ADR and catering fees. According to statistics from the Beijing Municipal Bureau of Statistics, from 2015 to 2018, the average house price of five-star hotels in Beijing continued to rise. Company A's hotel is located in the "San Li Tun" core commercial area, and the average price increase rate in 2019 is 5.1% lower than that of five-star hotels (Beijing municipal bureau of statistics [BMBS], 2018). Therefore, assuming the future growth rate of hotel ADR and meal expenses, the average value is 3.5% in the first to third years, and 2% in the fourth and fifth years.

Another key factor affecting hotel cash flow is the occupancy rate. According to statistics from the Beijing Municipal Bureau of Statistics, the occupancy rate of five-star hotels in Beijing continued to rise from 2014 to 2018, and slightly decreased in 2019, with the occupancy rate remaining at 69.6% (BMPS, 2019). This upward trend is in line with the development trend of Beijing's hotel industry in recent years. Therefore, assuming future hotel occupancy growth rates, an average of 2.5% in Years 1 to 3 and 1% in Years 4 and 5.

Based on the above assumptions, the main business income subjects in 2020 are predicted, and the forecast results are shown in Annexes 5.38.

Third, forecast the items in the profit and loss statement and the balance sheet that are assumed to hold a fixed proportion to the main business income and related subjects that are linked to the main business income. It can be seen from the above analysis that the hotel of Company A has not yet reached the mature stage of operation. As a conservative estimate, 2020-2021 costs and expenses are the same as in 2019. From 2022, the main business cost, selling expenses and management expenses will be reduced by 5%, 2% and 2% respectively. Other subjects still maintain the proportions in 2019 and make linkage adjustments.

Based on the above assumptions, the relevant subjects are predicted, and the prediction results are shown in Annexes 5.39.

Fourth, make hypothetical forecasts for the subjects in the income statement and balance sheet with no fixed proportion and linkage with the primary business income. Fill in the vacant subjects in the income statement and balance sheet. We assume that the annual depreciation amount remains a fixed accrual amount every year, and other payables and paid-in capital have not changed. The hotel's 2020 predicted balance sheet and income statement can be drawn based on the above assumptions.

Fifth, adjust the cash flow statement by combining the income statement and the balance sheet. As shown in Annexes 5.40.

5.2.2.3 Asset pool total cash flow

The above analysis clarifies the fixed proportions maintained by the two underlying asset accounting subjects of shopping malls and hotels each year. As shown in Table 5.8:

Table 5.8 Forecast annual accounting subjects and fixed ratio table

No.	Accounting Subject	Calculation Basis	Shopping mall 2020-2021	Shopping mall 2022-2024	Hotel 2020-2021	Hotel 2022-2024
1	Main Business Cost	Main Business Income	32.5%	29.5%	59.1%	54.1%
2	Operating Expense	Main Business Income	5.6%	4.6%	9.2%	7.2%
3	Management Fee	Main Business Income	11.4%	10.4%	29.3%	27.3%
4	Building Taxes	Main Business Income	8.4%	8.4%	8.4%	8.4%
5	Accounts Receivable	Main Business Income	4.1%	4.1%	1.0%	1.0%
6	Accounts Payable	Main Business Cost	0.8%	0.8%	6.5%	6.5%
7	VAT - output	Main Business Income	6%	6%	6%	6%
8	VAT - Input	Main Business Cost	35%	35%	60%	60%
9	City tax	VAT - (output	7%	7%	7%	7%

10	Education tax	VAT - (output and input difference)	3%	3%	3%	3%
11	Local tax	VAT - (output and input difference)	2%	2%	2%	2%
12	Flood control tax	VAT - (output and input difference)	1%	1%	1%	1%

At the same time, the increase rate of the key influencing factors of the two types of underlying assets of shopping malls and hotels in each year was clarified. As shown in Table 5.9:

Table 5.9 2020 - 2024 Key influencing factors predicted increase rate

No.	Economic Indicators	Predicted Increase Rate				
		2020	2021	2022	2023	2024
1	Commercial: Rent and Property Fees	7.5%	7.5%	7.5%	3%	3%
2	Commercial: Rental Rate	0.23%	0.23%	0.23%	0.15%	0.15%
3	Hotel: ADR and Food Fee	3.5%	3.5%	3.5%	2%	2%
4	Hotel: Occupancy Rate	2.5%	2.5%	2.5%	1%	1%

From this, a forecast table of cash flow statements for shopping malls and hotels from 2020 to 2024 can be derived. As shown in Table 5.10:

Table 5.10 2020 - 2024 Cash flow statement forecast table (unit: ten thousand yuan)

Item	2020	2021	2022	2023	2024
Operating Activities Cash Inflow:	**36,704**	**39,480**	**42,452**	**43,896**	**45,344**
Shopping mall:	**15,909**	**17,131**	**18,458**	**19,062**	**19,653**
—Rental	13,205	14,218	15,320	15,821	16,312
—Property Fee	2,705	2,912	3,138	3,240	3,341
Hotel:	**20,795**	**22,349**	**23,995**	**24,835**	**25,691**
—Guest Room	14,141	15,198	16,316	16,888	17,470
—Food	6,654	7,152	7,678	7,947	8,221
Operating Activities Cash Outflow:	27,906	29,882	29,955	31,118	32,351
Shopping mall:	**9,193**	**9,995**	**10,286**	**10,674**	**11,072**
—Goods and Labor Fee	2,427	2,723	2,609	2,770	2,938
—Pay Employee Related Expenses	640	650	650	650	650
—Taxes	3,758	4,057	4,597	4,743	4,889
—Other Expenses	2,367	2,565	2,430	2,511	2,595
Hotel:	**18,712**	**19,886**	**19,669**	**20,444**	**21,279**
—Goods and Labor Fee	5,825	6,085	5,971	6,369	6,820
—Pay Employee Related Expenses	3,629	3,810	3,800	3,800	3,800
—Taxes	2,653	2,846	3,089	3,196	3,302
—Other Expenses	6,605	7,145	6,808	7,079	7,357
Operating Activities Net Cash Flow:	**8,799**	**9,598**	**12,497**	**12,778**	**12,993**
Shopping mall:	6,716	7,135	8,171	8,388	8,582
Hotel:	2,083	2,463	4,326	4,391	4,412

5.2.2.4 Sensitivity analysis

The core of the sensitivity analysis of the cash flow of the underlying assets is whether the cash flow from operating activities generated by the underlying assets in the future can cover the principal and interest of the debt. Therefore, it is necessary to identify the critical factors that affect future operating activities' cash flow and analyze the stability of future cash flow. This article selects the four critical factors of rental unit price, rental rate, ADR, and occupancy rate as uncertain factors. The variation range of each uncertainty factor is shown in Table 5.11.

Table 5.11 Changes in uncertainty factors and single factor sensitivity analysis of net cash flow

Subject	Uncertainty Factors	Indicators				
Variation	Rental Price	-20%	-10%	0%	10%	20%
	Rental Rate	-20%	-10%	0%	10%	20%
	ADR	-20%	-10%	0%	10%	20%
	Occupancy Rate	-20%	-10%	0%	10%	20%
Sensitivity Factor	Rental Price	-0.174	-0.087	0.182	0.241	0.292
	Rental Rate	-0.174	-0.087	0.182	0.241	0.292
	ADR	-0.080	-0.017	0.194	0.205	0.210
	Occupancy Rate	-0.080	-0.017	0.194	0.205	0.210

As shown in Table 5.12, the forecast of the impact of different fluctuations of uncertain factors on the cash flow of operating activities, combined with the actual range of changes of key influencing factors. Therefore, we can analyze that the two factors that have a more significant impact on the cash flow of the operating activities of the underlying assets are rent and ADR.

Table 5.12 Different uncertain factors variation range influence on operating activities cash flow

Subjecting Item	Variation Range				
	-20%	-10%	0%	10%	20%
Operating Income					
—Rental Price	29,393	30,788	32,184	33,580	34,976
—Rental Rate	29,393	30,788	32,184	33,580	34,976
—ADR	28,539	30,362	32,184	34,007	35,829
—Occupancy Rate	28,539	30,362	32,184	34,007	35,829
- Operating Costs, Taxes, Fees					
—Rental Price	14,395	14,849	15,303	15,757	16,211
—Rental Rate	14,395	14,849	15,303	15,757	16,211
—ADR	13,150	14,226	15,303	16,379	17,455
—Occupancy Rate	13,150	14,226	15,303	16,379	17,455
- Income Tax Expense					
—Rental Price	1,154	1,298	1,443	1,587	1,732
—Rental Rate	1,154	1,298	1,443	1,587	1,732
—ADR	1,443	1,443	1,443	1,443	1,443
—Occupancy Rate	1,443	1,443	1,443	1,443	1,443
Net Profit					
—Rental Price	2,273	2,707	3,140	3,574	4,008
—Rental Rate	2,273	2,707	3,140	3,574	4,008
—ADR	3,373	3,257	3,140	3,024	2,908
—Occupancy Rate	3,373	3,257	3,140	3,024	2,908

+ Depreciation

—Rental Price	5,935	5,935	5,935	5,935	5,935
—Rental Rate	5,935	5,935	5,935	5,935	5,935
—ADR	5,935	5,935	5,935	5,935	5,935
—Occupancy Rate	5,935	5,935	5,935	5,935	5,935
- Accounts Receivable Increase					
—Rental Price	-134	-76	-18	39	97
—Rental Rate	-134	-76	-18	39	97
—ADR	-55	-37	-18	-0	18
—Occupancy Rate	-55	-37	-18	-0	18
+ Accounts Payable Increase					
—Rental Price	-571	-568	-564	-560	-556
—Rental Rate	-571	-568	-564	-560	-556
—ADR	-703	-633	-564	-494	-425
—Occupancy Rate	-703	-633	-564	-494	-425
+ Tax Payable Increase					
—Rental Price	-3	4	11	18	25
—Rental Rate	-3	4	11	18	25
—ADR	-7	2	11	20	29
—Occupancy Rate	-7	2	11	20	29
Operating Activities Cash Flow					
—Rental Price	7,768	8,155	8,541	8,928	9,315
—Rental Rate	7,768	8,155	8,541	8,928	9,315
—ADR	8,653	8,597	8,541	8,486	8,430
—Occupancy Rate	8,653	8,597	8,541	8,486	8,430
- Total Operating Activities Cash Flow in 2019	9,409	9,409	9,409	9,409	9,409
Change in Net Cash Flow					
—Rental Price	-1,641	-1,254	-867	-480	-93
—Rental Rate	-1,641	-1,254	-867	-480	-93
—ADR	-756	-811	-867	-923	-979
—Occupancy Rate	-756	-811	-867	-923	-979

Through single factor sensitivity analysis, comparing the absolute value of the sensitivity coefficient, it is concluded that the sensitivity of net cash flow to the four uncertain factors is very different. As shown in Table 5.8 above, the absolute value of the rental/rental rate sensitivity coefficient ranges from -0.174 to -0.01. The absolute value of the ADR/occupancy sensitivity coefficient ranges from -0.080 to -0.104. Because the calculation is based on the fixed-proportion growth method, the sensitivity to net cash flow is the same when the rental/rental rate and ADR/occupancy rate are adjusted in the same proportion. With the same amount of change, the rental/rental rate has a more significant impact on cash flow.

5.3 Asset securitization program design

5.3.1   The idea of program design

The design ideas of asset securitization of shopping mall and hotel projects mainly include three parts: determination of financing target, selection of transaction structure, and summary of a

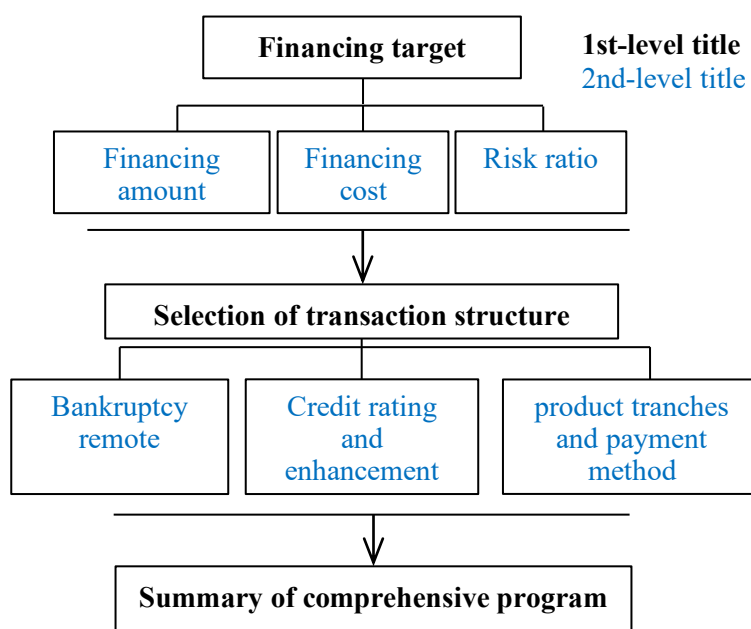comprehensive plan. The framework of the program design is shown in Figure 5.2.

Figure 5.2 Design framework of asset securitization program

For asset securitization program design, it is first necessary to determine the criteria for meeting asset securitization financing conditions. Secondly, it discusses the standard and setting basis of each means selection in the design of warrant transaction structure. Finally, it is necessary to calculate the effect of the comprehensive plan. Specifically, based on clarifying the financing target, combined with the characteristics of underlying assets and the practical data standards of asset securitization, it sets and selects the key indicators of bankruptcy remote, credit rating and upgrading, product grading and payment method, and finally obtains the comprehensive scheme.

5.3.2   Financing target setting

5.3.2.1   Financing amount

The financing purposes of real estate SMEs mainly include expanding investment, repaying bank loans, supplementing their working capital, and optimizing capital structure. Enterprises can design a financing plan to meet financing needs only when they determine the purpose of financing and match various conditions. This article uses the asset securitization scheme to finance, the purpose is to solve the financing needs of company A to invest in a vaccine manufacturer. Therefore, the purpose of company A's financing is to expand investment. The funding gap can be determined step by step according to the following steps:

Investment Budget.

To meet the construction needs of company A's investment, it is currently planning to invest 450 million yuan to construct vaccine production enterprises and equipment procurement. In order to clarify the budget status and specific financing needs, the budget status is summarized as shown in Table 5.13:

Table 5.13 Budget of vaccine manufacturer

No.	Budget Item	Budget Amount	Budget Percentage
1	Pre-engineering Fee	1,208	2.69%
2	Construction and Installation Fee	22,706	50.46%
3	Vaccine Research and Development Equipment	9,000	20.00%
4	Infrastructure Fee	8,273	18.38%
5	Public Facilities Fee	809	1.80%
6	Development Overhead	3,003	6.67%
7	Total	45,000	100.00%

Total funding requirement.

Company A has obtained 1.3 billion of external financing through bank loans. Because Company A hopes to replace the original bank loan through the asset securitization scheme, and at the same time obtain a part of the total financing quota for investment. Therefore, the total funding requirement for investment budget and replacement of original bank loans is 1.75 billion.

Funding gap.

The scale of the underlying asset pool predicted by Company A based on the five years is 566 million yuan. Therefore, the scale of the underlying asset pool predicted by the five years obviously cannot cover the corresponding financing scale, nor can it meet the financing amount required by the investment target. Therefore, it is necessary to extend the financing cycle of the asset securitization scheme to achieve the coverage of the special asset-backed plan by the cash flow of the underlying assets. Also, tenant leases and investor funds are sometimes relatively short-term, and there is a certain term mismatch. Therefore, Company A's asset securitization scheme needs to set an arrangement for opening every three years. According to the current capital cost, investors can choose to sell back during the open period, and financiers can make investors give up the sell-back or actively choose to redeem by adjusting the coupon rate. Taking the current practice of 3 years as a period and a maximum of 24 years, the required financing scale can be achieved through multiple periods.

The total capital demand of Company A is 1.75 billion, of which the self-owned funds available for investment are 150 million yuan. From this, it can be seen that the scale of financing required for Company A's asset securitization scheme is 1.6 billion. After replacing bank loans of 1.3 billion, the asset securitization financing plan based on business and hotel

assets, has a capital gap of 300 million yuan.

5.3.2.2 Financing cost

In the practice of asset securitization of real estate enterprises in China, financing cost is one of the important considerations when real estate SMEs choose financing channels. Especially in the case of "refinancing," it is vital whether the financing cost is reasonable or even more advantageous.

They were using the statistical data of real estate asset-backed securities issued in China from 2019 to 2020, comparing the financing costs of different credit ratings, different corporate attributes, and different time issuances, and researching the basis for selecting the financing cost range through the comparison method. This article screened the two sub-categories of "CMBS" and " quasi-REITs " in "Corporate ABS" from the CNABS database and collected 148 single asset securitization products and 374 asset-backed securities. Moreover, the above asset securitization products are further screened, and the screening criteria are as follows:

First, 146 asset-backed securities without financing costs were excluded.

Second, 2 asset-backed securities with substandard credit ratings were excluded.

After the above-mentioned data screening criteria and data collection, the number of asset-backed securities was reduced from 374 to 226. 225 real estate enterprise asset-backed securities are the research samples in this section.

As shown in Annexes 5.41, the total issued principal of 226 asset-backed securities was CNY267.3 billion, the total financing cost was CNY12.8 billion, and the average financing cost was 4.8%. Eighty-eight were lower than the average, with a total issuance principal of CNY127.9 billion, accounting for 48% of the total issuance cost; the total financing cost was CNY5.1 billion, accounting for 40% of the total financing cost. One hundred thirty-nine were higher than the average, with a total issuance principal of CNY138.9 billion, accounting for 52% of the total issuance cost; the total financing cost was CNY7.7 billion, accounting for 60% of the total financing cost. Among them, the financing cost of 4.5% to 5.5% (excluding) issued 86, the issuance principal accounted for 45%, and the financing cost accounted for 46%. The financing cost is 5.5% to 6.5% (exclusive) to issue 54 units, the issuance principal accounts for 14%, and the financing cost accounts for 18%. The data shows that financing costs between 4.5% and 6.5% are the main issuance range of real estate asset securitization products. However, the financing costs of real estate companies with different properties issued at the same credit rating at different times, or products issued at the same time with different credit ratings, will be different, so further analysis of the financing costs is required.

As shown in Annexes 5.42, by comparing the average financing cost of real estate asset securitization products issued by real estate companies with different attributes at the same credit rating at different times from 2019 to 2020, it shows that the average financing cost in 2020 is 81BP lower than that in 2019. In 2020 and 2019, the proportion of issuance principal and financing cost of "AAA" and "AA+" tranches exceeded 97%. Among the "AAA" tranches products, private enterprises have the lowest decrease in financing cost, which is reduced from 5.32% in 2020 to 5.14%, a decrease of 18BP; the highest decrease in financing cost was for state-owned enterprises, which decreased from 4.86% in 2020 to 3.8%, a decrease of 106BP. Among the "AA+" tranches products, private enterprises have the lowest decrease in financing cost, which is reduced from 6.07% in 2020 to 5.86%, a decrease of 21BP. The highest decrease in financing cost was for listed enterprises, which decreased from 5.69% in 2020 to 4.74%, a decrease of 95BP. The data shows that state-owned and listed enterprises' financing costs will be significantly adjusted at different issuance times of products with major credit ratings. The financing cost of private enterprises has always remained high, and there will be no significant adjustments.

As shown in Annexes 5.43, by comparing the financing costs of real estate asset securitization products issued by real estate companies with different attributes at the same time from 2019 to 2020 with different credit ratings, it is shown that in 2020, "AAA" rated products and "AA+" The financing cost of private enterprises among the top- tranches products is 94% higher than the average financing cost. The financing cost of state-owned enterprises is 40% and 41% lower than the average financing cost of each credit rating. The financing cost of listed enterprises is 17% and 19% lower than the average financing cost of each credit rating. In 2019, various types of enterprises also showed the same trend. In 2020, the financing cost of "AAA" tranches products and "AA+" tranches products in private enterprises, state-owned enterprises and listed enterprises will be 72 BP, 71 BP and 70 BP, respectively. In 2019, the spreads of financing costs for "AAA" tranches products and "AA+" tranches products in private enterprises, state-owned enterprises and listed enterprises were 76 BP, 55 BP and 75 BP, respectively. This shows that when products with different credit ratings are issued simultaneously, the financing cost of private enterprises is much higher than that of state-owned enterprises and listed enterprises. In terms of interest spreads of significant credit rating products, companies with different attributes tend to be consistent year by year.

As shown in Annexes 5.44, in 2020, the interest spread between the senior A tranches products and the senior B tranches products of the "AAA" tranches of private enterprises is 140BP. In 2019, the senior B tranches product of the "AAA" tranches was not released, and it

will be released in 2020. In 2020, the "AA+" senior A tranches product and the senior B tranches product have a spread of 15BP, and in 2019, the "AA+" senior A tranches product and the senior B tranches product have a spread of 18BP. It shows that the spread of "AAA" tranches products fluctuates wildly, while the spread of "AA+" tranches products fluctuates less. This further shows that the financing cost of "AA+" tranches products of private enterprises is less affected by various factors and remains high.

Because the main characteristics and asset characteristics of real estate SMEs in China are closer to those of private enterprises, the financing cost of asset-backed securitization products of private enterprises in the above analysis of financing costs has more practical reference significance for real estate SMEs. As can be seen from the above figure, the characteristics of "weak main body" of real estate SMEs make it possible that the highest credit rating of the product can only be rated as "AA+" during the credit rating. Under the circumstance that the financing cost of real estate asset securitization products is affected by various factors and causes the overall financing cost to change significantly, the financing cost of "AA+" products of private enterprises has not changed significantly. Therefore, it is more reasonable to set the financing cost at 5.8% for the senior A tranches products of Company A based on the "AA+" senior A tranches products in 2020. senior B tranches products are based on the financing cost of "AA+" senior A tranches products, and at the same time, the interest rate difference between "AAA" tranches products and "AA+" tranches products will rise by 70BP as a reference, that is, it is more reasonable to set the financing cost at 6.5%.

5.3.2.3 Risk ratio

In the practice of asset securitization of real estate enterprises in China, the risk ratio generally refers to the proportion of subordinated products in asset securitization products, which are often purchased by the promoters themselves. The differences in the characteristics of bankruptcy remote structure, enterprise attributes and asset securitization projects determine the size of the risk ratio.

We use the statistics of real estate asset-backed securities issued in China from 2019 to 2020 to compare the subprime ratio of private enterprises under different transaction structures, corporate attributes, and transaction structures. The comparative method studied the selection basis of the risk ratio range. In the following, 148 single asset securitization products and 374 asset-backed securities collected are used as research samples in this section.

As shown in Annexes 5.45, the total principal amount of the 374 asset-backed securities issued from 2019 to 2020 was CNY293.6 billion. Among the two main transaction structures,

the trust structure accounted for 73.3% and the fund structure accounted for 26.7%. The proportion of subordinated trust structures tending to be debt-financed ranges from 3% to 5%. Fund structures tending towards equity financing have subordinated proportions ranging from 18% to 30%.

As shown in Annexes 5.46, among different tranches designs and repayment methods under the same transaction structure, the maximum difference in the subordinate proportions in the trust structure is 1.47%, and the maximum difference in the subordinate proportions in the fund structure is 10.7%. It shows that under the different tranches designs and repayment methods of the two transaction structures, the difference rate of the subordinated proportion of the trust structure is low, while the different rate of the fund structure is significant.

As shown in Annexes 5.47, in the average subordinated proportion of different enterprise attributes, private enterprises and state-owned enterprises account for a relatively small proportion, and the subordinated proportion ranges from 5.5% to 6.5%. In comparison, the subordinated proportion of listed enterprises is higher than 10%. In the two main tranches designs of enterprises with different attributes, the subordinated proportions of private enterprises, state-owned enterprises and listed enterprises are 0.06%, 6.94% and 5.56%, respectively. In the two stratified designs, the difference rate of the subordinated proportion of private enterprises is smaller, while the different rate of the subordinated proportion of state-owned and listed enterprises is more significant.

In order to further clarify the basis for the selection of the risk ratio range, it is necessary to further analyze the subordinated proportion of private enterprises under different transaction structures and tranches designs according to the proximity of the main characteristics and asset characteristics of China's real estate SMEs to private enterprises. As shown in Annexes 5.48, the sub-proportion under the trust structure is between 4% and 6%, and the difference in sub-proportion under the two-tranches designs is 1.23%. The sub-proportion under the fund structure is between 10% and 14%, and the difference in sub-proportion under the two-tranches designs is 2.4%. The different rate of subordinated proportions of different transaction structures under the senior/subordinated tranches design is 7.56%. The subordinated proportion difference rate under the senior/mezzanine/subordinated tranches design was 6.39%. It shows little difference in subordinated proportions among different tranches designs of the same transaction structure. However, the subordinated proportions under the same tranches design with different transaction structures are more volatile.

As can be seen from the above figure, the risk ratio ranges of Company A can refer to the subordinated ratio range of private enterprises as a reference. It is reasonable to set the

subordinate ratio to 4% to 6% under the trust structure, and it is more reasonable to set the subordinate ratio to 10% to 14% under the fund structure.

5.3.3 Choice of means of bankruptcy remote

There are two main bankruptcy remote methods in the practice of asset securitization of Chinese real estate enterprises, namely "trust structure" and "fund structure". The difference between the requirements of the two structures and the characteristics of the asset securitization project itself determines which bankruptcy remote method to choose. Because both structures use the special asset-backed plan as the particular purpose vehicle for corporate asset securitization, the effect of bankruptcy remote is the same. However, the different structured arrangements made by bankruptcy remote offices make significant differences in financing effects. Therefore, a detailed analysis of the means of bankruptcy remote is required.

As can be seen from the comparison in Annexes 5.49, in the trust structure and the fund structure, the former is mainly that the original owner obtains the trust loan by mortgaging the ownership of the real estate and repays the principal and interest of the issued asset-backed securities products by relying on the cash flow generated by the collateral in the future. The latter requires the original owner to pool funds by selling equity to issue fund shares. Under the two transaction structures, the former tends to be debt financing, while the latter tends to equity financing.

Use statistics on issued real estate asset-backed securities in China from 2019 to 2020 for comparison. Different enterprise attributes in the two structures have significant differences in the choice of bankruptcy remote methods in different tranches designs. After excluding the tranches design of "multinational enterprises" and "Senior A/Senior B," the collected 145 single-asset securitization products and 368 asset-backed securities are used as the research samples in this section.

As shown in Annexes 5.50, the total principal amount of the 368 asset-backed securities issued from 2019 to 2020 was RMB 291 billion. The issuance principal and issuance amount accounted for 73.3% and 26.7%, 68.2% and 31.8% respectively in the trust structure and fund structure. The proportion of issued principal and issued amount in private enterprises, state-owned enterprises and listed enterprises was 18.4%, 16.8% and 64.8%, 17.9%, 22% and 60.1%, respectively. The data shows that the choice of bankruptcy remote is mainly based on the trust structure, and private enterprises do not occupy the central issuing position. Private enterprises' issuance of principal and the number of discoveries accounted for a higher proportion in the

trust structure, and the " Senior/Subordinated " tranches design program accounted for a higher proportion of the two-tranches designs of the trust structure.

The above table shows that private enterprises have many issuances in the trust structure, but the amount is relatively small. In the fund structure, the number of issuances is small, but the issuance amount is relatively large. However, private enterprises are more likely to use the trust structure for bankruptcy remote. For Company A, due to the closeness of the characteristics of real estate SMEs and private enterprises, it is more suitable to choose private enterprises as the benchmark enterprise for its bankruptcy remote method. In addition, the length of the financing cycle, the efficiency of the financing model and the convenience of the financing model operation are also critical criteria for the choice of the bankruptcy remote method of Company A. For this standard, the following analysis is carried out:

The Length of the Financing Cycle

At present, the bank loan of Company A is an operating property loan, which is a debt financing like similar to the trust structure. It has similarities in specific operations and can significantly shorten the financing time. If the fund structure is adopted, since Company A's residential, commercial and hotel projects are complex, the underlying assets of Company A's asset securitization do not include residential properties. Therefore, dividing the property rights of businesses and hotels will inevitably face the cost allocation of three types of assets, the essential aspects of industry and commerce, housing management, and taxation of land value-added tax liquidation. Therefore, the financing cycle is bound to be significantly extended.

The Efficiency of Financing Structure

The trust structure is a quaternary transaction structure based on "special asset-backed plan - trust plan - project company - underlying assets". Its essence is to form a trust plan into a commercial property mortgage loan, securitize the trust beneficiary right of the loan, and use the operating income in the next few years as the source of repayment. The fund structure is a five-yuan transaction structure based on "asset-backed special plan-fund/trust loan-SPV-project company-underlying assets". Its essence is that the manager purchases the fund shares of the original equity holders with the subscription funds, realizes the transfer of the underlying assets from the original equity holders to the particular plan, and collects funds through the sale of private equity capital shares. However, the transfer of the primary assets of the fund structure involves housing management, taxation and other departments, and the handling efficiency is seriously reduced.

The convenience of financing mode operation

The structure of "nested" trusts for special asset-backed schemes is mainly due to the

different quality of the underlying assets. Due to the low degree of specificity of various underlying assets of real estate companies, there is a difference in amount and term mismatch between the cash flow of the underlying assets and the repayment of principal and interest of the asset-backed plan. Therefore, a trust plan is added to the transaction structure to collect the underlying assets, and the underlying assets with a low degree of specificity are converted into those with a high degree of specificity. The trust beneficiary rights are formed by issuing trust loans to the financier, and the uncertain future benefit rights are converted into definite creditor's rights. It meets the specific requirements and facilitates the collection of cash flow, especially when the underlying assets involve multiple entities.

Through the above analysis, it can be concluded that company A's choice of trust structure by means of bankruptcy remote is more suitable.

5.3.4   Credit rating and upgrading

5.3.4.1 Credit rating

In the practice of asset securitization of real estate enterprises in China, credit rating has essential reference value for the promotion and risk assessment of asset securitization products. The corporate attributes and transaction structure have an important impact on the credit rating of asset securitization products. Therefore, a detailed analysis of credit ratings is required.

Using the statistics of real estate asset-backed securities issued in China from 2019 to 2020, comparing the credit ratings of different property companies and different transaction structures shows significant differences. After excluding the tranches design of "listed enterprises" and "senior A/senior B," the collected 146 single-asset securitization products and 371 asset-backed securities are used as the research samples in this section.

As shown in Annexes 5.51, the total principal amount of the 371 asset-backed securities issued from 2019 to 2020 was 291.8 billion. Compared with private and state-owned enterprises and listed enterprises, the different rates of "AAA" tranches products in the two-tranches designs are 16%-18% and 14%-15%, respectively. Compared with state-owned enterprises and listed enterprises, the different rates of "AA+" in the two-tranches designs are 18%-21% and 14%-22%, respectively. It shows that the proportion of private enterprises in the leading credit rating is much lower than that of enterprises with other attributes.

Compared with state-owned enterprises and listed enterprises, the different rates of "AAA" tranches products of private enterprises in the two-tranches designs are 16%-18% and 14%-15%, respectively, and the different rates of private enterprises "AA+" in the two-tranches

designs are 18%-21% and 14%-22% respectively. It shows that the proportion of private enterprises in the primary credit rating is much lower than that of enterprises with other attributes.

As shown in Annexes 5.52, credit ratings vary widely among different transaction structures. The most striking difference is between "AAA" rated products and "No Rated" rated products. The average difference rate of "AAA" tranches products is 9%, and the average value difference rate of "unrated" tranches products is 20%. The different rates of "AAA" tranches products in the two-tranches designs of the two transaction structures are 7% and 6%, respectively, and the different rates of "unrated" tranches products in the two-tranches designs of the two transaction structures are respectively 22% and 18%.

As shown in Annexes 5.53, the difference between the trust structure and fund structure of the average value of "AAA" products of private enterprises in the two transaction structures is 27%, and the difference between the average value of "AA+" products in the trust structure and fund structure is 31%. The different rates of "AAA" under the "senior/subordinated" stratification and "senior/mezzanine/subordinated" stratification design of the two transaction structures are 23% and 33%. The different rates of "AA+" under the "senior/subordinated" stratification and "senior/mezzanine/subordinated" design of the two transaction structures are 31% and 36%.

It can be seen from the above figure that for Company A, due to the low credit level of the main body, it needs to be divided into two files: asset credit enhancement and guarantee agency credit enhancement. Therefore, the credit rating of the "senior/mezzanine/subordinated" tranches design of the trust structure of private enterprises is more suitable.

5.3.4.2 Credit enhancement

In the "senior/mezzanine/subordinated" tranches design of the trust structure of the asset securitization practice of real estate enterprises in China, credit enhancement is divided into internal and external credit enhancement according to different sources of credit support. Combined with the requirements of the transaction structure and the essential assets and cash flow characteristics of Company A, the internal credit enhancement mainly relies on the asset itself for credit enhancement, and the external credit enhancement mainly relies on third-party guarantees to provide credit support.

As shown in Table 5.14, to obtain a better credit rating for asset securitization products, Company A clarified the risks that will arise in the process of asset securitization and the standards that the corresponding credit enhancement methods need to meet.

Table 5.14 Company A's credit enhancement means

No.	Enhancement Means	Applicable	Against Risk	Standard
1	Senior-Subordinated structure	Internal	Insufficient cash flow from underlying assets	The principal and interest payment or loss distribution has senior and subordinated order
2	Over Cash Flow Coverage	Internal	Insufficient cash flow from underlying assets	There is a senior and a subordinated senior in the payment of principal and interest or the distribution of losses
3	over collateralization	Internal	Disputes over ownership of underlying assets	The coverage ratio of the senior principal and interest in each period is not less than 2 times
4	Setup Margin Account	Internal	Insufficient cash flow from underlying assets	The ratio of company A's financing scale to the property's appraised value (i.e., mortgage rate) shall not be higher than 60%.
5	shortfall payment commitments	External	Insufficient cash flow of underlying assets and default on payment commitments	Set a minimum margin amount
6	Accounts Receivable Pledge and Fund Supervision	External	Insufficient cash flow from underlying assets	In case of insufficient repayment, the shortfall shall be obligated to make up

According to the above-mentioned standards of credit enhancement methods, the analysis of the setting basis is as follows:

Senior-Subordinated structure. Company A's credit subject rating is low. However, the characteristics of the continuous and stable cash flow of the underlying assets allow asset-backed special plan to be subdivided into asset credit enhancement and guarantee agency credit enhancement. The redistribution of risks is realized by providing credit support for the asset-backed securities of the upper tranches through the subordinated asset-backed securities of the next tranche. When a credit event occurs in the redemption of asset-backed securities, the distribution sequence of the cash flow of the underlying assets will be rearranged to strengthen the income protection for the senior securities.

Over Cash Flow Coverage. Combined with the issued real estate asset securitization products, the rental income generated from the underlying assets of shopping mall and hotel project not only needs to over-cover the principal and interest payments of the senior asset-backed securities, but also needs to be evenly repaid according to the cash flow. Therefore, it is reasonable for the cash flow generated by the underlying assets to be not less than 1.7 times the

total coverage ratio of the senior principal and interest.

Over collateralization. As the actual financier, Company A mortgages the house ownership and land use rights of the subject property to the trust plan to guarantee the borrower's principal and interest repayment obligations under the trust loan. The ratio of company A's financing scale to the property's appraised value (i.e., mortgage rate) shall not be larger than 60%. At present, according to the Real Estate Valuation Report issued by the appraisal company, the valuation of Company A is 2.7 billion, which is approximately 1.68 times the issuance scale of senior Class A asset-backed securities of 1.6 billion, and the mortgage rate of Company A is 59.25%. Therefore, over asset collateral can provide effective credit enhancement for asset-backed securities.

Setup Margin Account. Company A needs to open a margin account with a regulatory bank and deposit the margin. When a margin top-up activation event occurs, fund top-up is provided to the particular plan account to repay the principal and interest of the senior asset-backed securities. According to the funds retained in the deposit subject under the Trust Loan Contract, during the duration of the trust plan, the deposit amount in the deposit subject is 18 million yuan.

Shortfall payment commitments. Company A introduced its parent company T Group and a third-party guaranteed institution with an AAA credit rating. The cash flow generated by the underlying assets of the particular asset-backed plan cannot be paid in sequence and the difference between the principal of the senior asset-backed securities and the expected return shall be obligated to make up. At the same time, it provides a guarantee for the principal and interest repayment obligations under the trust loan contract. If it constitutes a guaranteed initiation event, the guarantor will perform the corresponding guaranteed responsibility.

Accounts Receivable Pledge and Fund Supervision. Company A handles the pledge registration with the lender by using the shopping mall and hotel rental income accounts receivable, and as an asset service agency, transfers the rental income to the supervision account every week to provide pledge guarantees for the repayment of loan debts.

5.3.5 Product tranches and payment method

China's real estate enterprise asset securitization practice mainly has two-tranches designs: "senior/mezzanine/subordinated " and "senior/subordinated." Since different tranches designs have different requirements for subject credit and asset credit, it is necessary to decide which tranches design to choose based on the characteristics of the asset securitization project itself.

Therefore, a detailed analysis of product tranches and payment method is required.

Using the statistics of real estate asset-backed securities issued in China from 2019 to 2020, comparing the tranches design of different property companies and different transaction structures shows significant differences. After excluding "multinational enterprises," the collected 147 asset securitization products and 372 asset-backed securities are used as research samples in this section.

As shown in Annexes 5.54, in the "senior/mezzanine/subordinated" product tranches design, compared with state-owned enterprises and listed enterprises, the different rates of products at all tranches of private enterprises are 1%-2%, 3%-6%, and 3%-7%. In the "senior/subordinated " product tranches design, the variance rate of products at each tranche ranges from 1% to 4%. Under the circumstance that there are significant differences in the subordinated proportion of Chinese state-owned enterprises and listed enterprises in the two-tranches designs, the subordinated proportion of private enterprises is relatively stable, remaining between 6.2% and 6.3%.

As shown in Annexes 5.55, further analysis of the stratified proportion of "senior/mezzanine/subordinated" shows that the average value of "senior" products in 2020 will increase by 22.23% compared with 2019, and the average value of "mezzanine" products will drop by 25.04%. That is, the proportion of layers in the "senior/mezzanine/subordinated " layered design scheme in 2020 is "67%: 28%: 5%".

The above figure shows that private enterprises have unique asset-backed plans with the characteristics of "strong assets and weak entities." In the credit enhancement method and product structure approved by the Shanghai Stock Exchange for the asset securitization projects of real estate enterprises under review, the product tranches need to be divided into asset credit enhancement files and guarantee agency credit enhancement files. Company A conforms to the above characteristics of private enterprises, so Company A needs to adopt a tranches design scheme of "senior/mezzanine/subordinated." That is to say, the senior A file needs to rely on the underlying assets for credit enhancement to become the asset credit enhancement file. The senior B file mainly relies on the parent company T Group and external guarantee institutions to provide credit enhancement and becomes the guaranteed institution's credit enhancement file. Therefore, referring to the "senior/mezzanine/subordinated " stratification ratio of private enterprises in 2020, it is more suitable to set the proportion of each stratum of Company A to "65:30:5".

In addition, because the senior principal payment method will also have an impact on the tranche ratio, it is necessary to analyze further the two principal payment methods of a fixed

payment and sequential payment in combination with the characteristics of Company A's "strong assets and weak subjects." Company A's characteristics of "strong assets and weak entities" make the expected cash flow of the underlying assets continue to increase. Adopting sequential repayment will result in early repayment of the principal, which will result in a decrease in the actual rate of return. Therefore, to ensure the stability of the yield of Company A's asset securitization scheme, the principal and interest of the senior securities can be paid in full at the agreed time. A company's senior principal redemption method is more suitable for fixed repayment.

5.3.6   Summary of program

The asset securitization scheme for the shopping mall and hotel projects clarifies the standards of multiple means and analyzes the basis for setting the standards. The scheme has become a securitization product that meets a series of standard settings. By applying a standard setting in a cash flow model based on a fixed income, a comprehensive scheme for the quantified asset securitization of Company A can be derived theoretically. As shown in Table 5.15:

Table 5.15 Asset securitization program standard and setting basis

Conditions	Standards and Setting Basis
Bankruptcy Remote Structure	Trust Structure
Financing Scale	1.6 billion
Program Duration	3 years as a period, 6 periods + 2 years
Main Tranches Design	senior: mezzanine: subordinated "65%:30%:5%"
Senior Repayment Method	Fixed Repayment
Return Rate	Senior A 5.8%; Senior B 6.5%
Cash Guarantee Multiple	Senior 1.5 times
Annual Rate	1%

According to company A's asset securitization scheme standards and setting basis, through path selection and a quantitative model applied to cash flow based on a fixed income, the financing effect of company A can be predicted. As shown in Table 5.16, it is assumed that the principal of 10 million is paid on a fixed basis at the end of each year from the first year to the fourth year, and the balance is predicted to be paid at the end of the fifth year. Under the support of the fundamental asset pool of 566 million yuan estimated in the five years, 400 million yuan is the relatively optimal issuance scale. The 20-year asset securitization scheme can achieve a financing amount of 1.6 billion without considering the current value conversion.

Table 5.16 Asset securitization comprehensive scheme calculation table

Year	Senior Principal	Senior Interest	Mezzanine Principal	Mezzanine Interest	Subordinated Principal	Subordinated Interest	Fee	Total
1	10,000,000	15,080,000	-	7,800,000	-	1,740,000	4,841,236	39,461,236
2	10,000,000	14,500,000	-	7,800,000	-	1,740,000	5,779,599	39,819,599
3	10,000,000	13,920,000	-	7,800,000	-	1,740,000	7,060,638	40,520,638
4	10,000,000	13,340,000	-	7,800,000	-	1,740,000	8,663,644	41,543,644
5	220,000,000	12,760,000	120,000,000	7,800,000	20,000,000	14,448,835	10,296,048	405,304,883
Total	260,000,000	69,600,000	120,000,000	39,000,000	20,000,000	21,408,835	36,641,165	566,650,000

The forecast of key indicators of asset securitization of Company A is shown in Table 5.17:

Table 5.17 Asset securitization key indicators

Subject	Return Rate	Cash Flow Guarantee Multiple	Duration
Overall	6.50%		2.75
Senior	5.80%	1.72	4.09
Mezzanine	6.50%		4.35
Subordinated	17.13%		4.28

The above scheme standards and setting basis are only part of the assumptions. Changes in transaction structure, principal repayment method, interest rate, yield, rate and other factors will affect the financing effect of asset securitization of real estate SMEs. Therefore, for the overall process of asset securitization, it is necessary to consider how to meet many conditions such as bankruptcy remote, credit enhancement, and tranches design in combination with the underlying assets themselves.

5.4 Implementation effect and potential risks

5.4.1　The overall framework for evaluating the implementation effect of securitization

The implementation effect evaluation and risk control of securitization program is an important part of the implementation process of asset securitization of small and medium-sized real estate enterprises, and these two indispensable components will always run through the whole process of asset securitization program.

The evaluation of the implementation effect needs to select scientific evaluation criteria to accurately judge the value of the asset securitization program, so as to determine whether the scheme is feasible or terminated, so as to improve the quality of the implementation of the

program. The evaluation of the implementation effect of the securitization program mainly includes four aspects: capital structure, financing cost, asset liquidity and flexibility in the use of funds. Specifically, it is assessed whether the capital structure has been improved through the realization of the demand for financing quota, the improvement of cash flow and the relief of debt repayment pressure (Wu, 2013). Through a single financing channel, the weighted average cost of capital and the increase of the rate of return on net assets, evaluate whether the financing cost is reduced, and the rate of return is increased (Wojtowicz, 2014). Through whether the cash flow of all kinds of underlying assets can be transformed from operating short-term liquidity to long-term stock funds with continuity and stability, evaluate whether it has the function of revitalizing the stock assets and improving the efficiency of the use of funds (S. S. Zhang et al., 2018). Through whether the nature of funds can be transformed from restricted funds to unrestricted funds and from indirect financing to direct financing, it is evaluated whether to broaden the flexibility of the use of funds (C. S. Guo & Xie, 2015) . Through the comprehensive evaluation of the implementation program of asset securitization, this thesis analyzes the existing problems before and after implementation and the parts to be optimized and improved, so as to provide theoretical and practical support for further scheme decision-making. The most important thing to analyze the implementation effect of enterprise asset securitization is to understand its accounting treatment. The effect of asset securitization not only needs to be analyzed from the financial data disclosed by the enterprise, but also needs to compare and analyze the effect of the asset support plan itself and the financial effect produced by other related contents.

The risk control of securitization program is that small and medium-sized real estate enterprises should fully consider the major risks and controllable boundaries in the process of implementing asset securitization. For small and medium-sized real estate enterprises, it is not to design a suitable asset securitization program, we can smoothly implement the program, or after the implementation of the program can achieve the desired results. Instead, it is necessary to implement risk control before, during and after the implementation of the securitization program in three aspects: policy risk, market risk and moral hazard of rating agencies. Specifically, through the timely grasp of the policy content and the in-depth study of the policy trend, it is clear that the policy content for small and medium-sized real estate enterprises to implement asset securitization, which are bearable policy risks, which are unbearable policy risks. Among the bearable policy risks, the concrete indicators need to be adjusted and improved, and which indicators need to be compensated by other ways because they cannot be adjusted and improved for various reasons. Through the analysis of the market situation and market trend,

fully consider the transmission effect of market risk on small and medium-sized real estate enterprises, as well as the possible uncertainty in the implementation process of asset securitization. Through the "negative externalities" of illegal, illegal events and scandals of credit rating agencies, the credibility of asset securitization products is seriously affected by the risk of questioning, and the credibility of asset securitization products is predicted and avoided in advance. Constantly improve the understanding and prediction of the objectivity and predictability of all kinds of risks in the implementation of securitization, so that the risks can be fully estimated, and relevant decisions can be made.

5.4.1.1 Improve the capital structure and ease the pressure of debt repayment

Under the policy background that the indirect financing channels of bank credit in the real estate industry have been tightened, while the direct financing channels of asset securitization have been supported and encouraged. Company A avoids the disadvantage of indirect financing based on the overall corporate property rights and turns into the advantage of direct financing by relying on two kinds of high-quality underlying assets of commerce and hotel as the credit basis. It has realized not only the transformation from indirect financing to direct financing, but also the transformation from subject credit to asset credit. The Shopping mall and hotel project successfully raised 1.6 billion through the implementation of real estate asset securitization financing, which not only repaid the bank's operating property loan of 1.3 billion, but also solved the problem of funding gap for investment and development. More importantly, through asset securitization financing, we can get rid of the risk of capital chain rupture caused by capital mismatch and term mismatch under the strong regulatory environment, as well as a series of operational risks and financial risks caused by capital uncertainty in the strong regulatory environment.

Company A raised 1.6 billion through a combination of bank credit and trust loans in 2015, and the principal has been repaid since 2017. In a strict regulatory environment, while superimposing the impact of the "epidemic", for the cash-strapped A company, delaying the repayment of principal can greatly alleviate the debt repayment pressure and avoid the occurrence of major financial risks. Company A has three underlying assets: residential, commercial and hotel. Like the business model of many real estate enterprises, the realization of residential assets is often realized through high-speed turnover. Therefore, even if A company is dealing with operating property loans, but in practice, the main body of the loan is still residential sales rebate. Therefore, whether the housing of Company A can be sold normally and form a large-scale payback in time plays a key role in the operation and development of

Company A. Especially when the expected rebate for residential sales needs to be used to repay the loan. When the residential sales repayment and loan repayment have a mismatch in time or in the amount of repayment, for Company A, it will lead to irreparable serious impact. However, the planned sales pace produced many uncontrollable factors under the influence of the epidemic in 2020, which ultimately led to the failure of the sales plan. As shown in Table 5.18, the original plan was to obtain a rebate of 498 million through residential sales to repay the principal of the loan for the current year and to support the normal operation and development of the enterprise. However, due to the impact of strict supervision and epidemic situation, residential sales did not achieve that year. As a result, a funding gap of 102 million is expected. Especially if the bank credit is defaulted and the enterprise credit is downgraded, it will produce a series of problems that seriously affect the normal operation of the enterprise. Therefore, to make up the funding gap in time is not only the problem that affects the development of the enterprise, but also the problem that affects the survival of the enterprise. Through the implementation of asset securitization financing for commercial and hotel projects, Company A not only repaid the maturing debt in time, but also obtained funds for follow-up investment and development and construction, with the actual fund balance reaching 500 million yuan in that year. Company A repaid its debt in time through the implementation of asset securitization of commercial and hotel projects, which enabled it to make a smooth transition from the crisis, increased the company's financial stability, and improved the company's debt repayment ability.

Table 5.18 Comparison table of debt repayment effect of company A

Subject	Original plan	Expected status of the original plan	Present plan
Cash inflow from operating activities	86,504.29	36,704.29	36,704.29
Cash inflow from operating activities	34,785.31	31,229.59	31,229.59
Net cash flow from operating activities	51,718.98	5,474.70	5,474.70
Cash inflows from fund-raising activities	0.00	0.00	160,000
Cash outflow from fund-raising activities	41,488	41,488	141,232
Net cash flow from fund-raising activities	-41,488	-41,488	18,768
Opening balance	25,804.49	25,804.49	25,804.49
Final balance	36,035.47	-10,208.81	50,047.19

In addition, through the comparison of long-term and short-term debt before and after the implementation of asset securitization of company A, we can see that under the environment of strict supervision and epidemic factors, the implementation of asset securitization brings huge time advantage to company A. As shown in Table 5.19, although the overall debt size of Company A has increased by 33.33% after the implementation of asset securitization, the amount of debt repayment for the year from 1 to 3 years has decreased by 98.3%, 97.5% and

92.5%. During this period, through deferred repayment of loans, Company A cannot only effectively avoid all kinds of risks caused by insufficient cash flow, but also cushion the financial pressure of Company An in a strict regulatory environment. It can be seen that asset securitization can effectively alleviate the debt pressure of company A and improve the debt structure of companies. As a result, the conversion of liquidity is realized.

Table 5.19 Comparative table of debt maturity of two options of company A

Scheme	Financing channel	Overall liability	One-year liability	Two-year liability	Three-year liability	Liabilities over 3 years
Original plan	Total	180,000	30,000	40,000	20,000	90,000
	Bank credit	60,000	20,000	25,000	10,000	5,000
	Trust	40,000	10,000	15,000	10,000	5,000
	Shareholder loan	80,000				80,000
Asset securitization program	Total	240,000	500	1,000	1,500	237,000
	Shareholder loan	160,000	500	1,000	1,500	157,000
	Asset securitization	80,000				80,000

5.4.1.2 Reduce the cost of financing and increase the rate of return

For enterprises, only when a certain financing significantly reduces its financing cost, it is a reasonable financing. The financing costs of small and medium-sized real estate enterprises include not only the explicit financing costs such as interest, but also the hidden costs such as related expenses. As shown in Table 5.20, before the implementation of asset securitization, Company A's corporate debt consists of three parts: bank credit, trust and shareholder borrowing. The financing cost of bank credit has risen by 40% on the basis of a five-year loan rate of 4.9%, with an overall interest rate of 6.86%. The financing cost of the trust is 12%. The financing cost of shareholder borrowing is 5%. The weighted average capital cost rate before the implementation of asset securitization was 7.36%. After the implementation of asset securitization, company A's corporate debt consists of asset securitization and shareholder borrowing. The explicit financing cost of asset securitization is 6.02%, plus the necessary comprehensive fee of 1%, the comprehensive financing cost is 7.02%. The financing cost of shareholder borrowing is 5%. The weighted average capital cost rate after the implementation of asset securitization is 6.33%. Through the comparative analysis of the financing cost of company A before and after the implementation of asset securitization, we can see that the overall financing cost of company A has decreased 103BP after the implementation of asset securitization. Thus, it can be seen that asset securitization has significant cost-saving

advantages.

Shopping malls and hotel projects have increased their return on equity through asset securitization. Through DuPont analysis, the rate of return on net assets is divided into net interest rate of sales, asset turnover rate and equity multiplier, which shows that the rate of return on net assets of Company A has been improved after the implementation of asset securitization. After considering making up for losses, excluding the impact of income tax, the net interest rate on sales increased to 33.51% from 33.2% before the implementation of asset securitization. After using profits to make up for losses, the total asset turnover ratio decreased by 0.01%, the asset-liability ratio decreased by 0.04%, and the equity multiplier decreased by 0.01%. The turnover rate of net assets increased by 0.2%. From this, we can see that A company can improve the operating effect better by using trust asset securitization than the combination of bank loan and trust channel loan. Increase net profit by 2.56 million through lower financing costs. Compared with the traditional financing method, the overall profit increased by 0.93%. At the same time, the return on equity of the project increased from 30.86% to 31.06%, an increase of 0.2%. From this, it can be seen that the implementation of asset securitization in Company A has improved its profitability.

Table 5.20 Comparative table of financing cost and return on net assets of company A

Project	Subject	Before implementation	After implementation
Financing cost	Total liability	210,000.00	240,000.00
	Bank credit	80,000.00	
	Trust	50,000.00	
	Shareholder loan	80,000.00	80,000.00
	Asset securitization		160,000.00
	Bank borrowing rate	6.86%	
	Trust interest rate	12.00%	
	Shareholder borrowing rate	5.00%	5.00%
	Asset securitization interest rate		7.02%
	Weighted average cost of capital	7.36%	6.33%
Return on net assets	business income	82,978.56	82,978.56
	Net profit / excluding income tax affects net profit	27,546.39	27,802.39
	Total liability	397,463.17	397,463.17
	Total assets	486,722.05	486,978.05
	Net profit rate of sales	33.20%	33.51%
	Total asset turnover	17.05%	17.04%
	Asset-liability ratio	81.66%	81.62%
	Equity multiplier	5.45	5.44
	Return on net assets	30.86%	31.06%

5.4.1.3 Invigorate the existing assets and improve the efficiency of funds

The format of the underlying assets of real estate enterprises determines the speed of realization and the state of funds. For the two underlying assets of business and hotel, the attribute of heavy assets determines that the return on investment has a long period. As of 2019, the overall asset value of Company A is 2.151 billion. Among them, the asset value of business and hotel is 1.535 billion. According to the forecast of the future income of the two underlying assets, the combined annual net cash flow of the two underlying assets is higher than 87.99 million yuan since 2020. Based on the existing forecast data, the investment payback period of these two underlying assets needs to be at least more than 12 years. The two underlying assets are mainly financed by day-to-day operating income. The collection of its funds is on a monthly basis, and a certain amount of funds is formed after the annual income distribution. From this, it can be seen that the funds generated by these two underlying assets are a kind of short-term liquid funds. However, the real estate investment and development of enterprise A is based on a large amount of funds. Obviously, the short-term and small liquidity funds formed by the two underlying assets of commerce and hotel cannot support the further investment and development of A company in terms of time and scale.

However, as far as the enterprise is concerned, Company A has changed this situation by securitizing the two underlying assets of business and hotel. Company A securitizes the future operating income rights of the two underlying assets and connects the operating short-term flow of funds to form a continuous and stable long-term stock of funds. Realize the current realization of long-term assets, so that the operating short-term liquidity funds in the next 20 years can be realized in advance. By obtaining the future income of this part of the assets in advance, it not only greatly improves the liquidity of the assets, but also means to invigorate this part of the assets and improve the efficiency of the use of the assets. This not only shortens the return-on-investment cycle for businesses and hotels, but also increases the utilization rate of funds. More importantly, through the transformation from short-term, small liquidity funds to long-term, large and stable funds, Company A meets the needs of its continuous investment and construction and development in terms of time and scale.

In addition, in terms of asset securitization, because the lease and sale of the two underlying assets of shopping mall and hotel are relatively low, the formed short-term liquidity funds can not cover the corresponding financing scale. Therefore, we can only extend the financing period to achieve the coverage of the special asset support plan by cash flow. Therefore, the duration of asset-backed securitization products for shopping mall and hotel projects is 20 years. At the

same time, the operating income of the two underlying assets and the funds of investors are relatively short-term, there will be a certain term mismatch. Therefore, the asset securitization products of shopping malls and hotel projects can make a two-way choice of redemption and redemption between investors and asset securitization projects by designing a transaction arrangement for an open period every three years. According to the cost of capital in the current period, investors can choose to sell back, while asset securitization projects can make investors give up redemption or actively choose redemption through the adjustment of coupon rate. In this way, asset securitization products can not only shorten the issuance cycle through rolling issuance, but also be more easily recognized by investors. Thereby, the conversion of the deadline is realized.

5.4.1.4 Broaden the flexibility of the use of funds

Shopping mall and hotels achieve different types of capital conversion through the implementation of asset securitization, so that restricted funds are converted into unrestricted funds. With the gradual extension of Chinese real estate asset securitization to the field of public offering, the information disclosure and internal governance mechanisms established based on or borrowing from the standard asset securitization of overseas capital markets have gradually entered the market's vision. The funds obtained by shopping mall and hotels through capital securitization financing are raised through direct financing in the capital market.

The use of the funds is not restricted and can be used in future investment, development, and construction. In the past, Company A used the bank credit obtained by indirect financing in the two stages of real estate development, construction, and survival operation. The bank credit in the two stages is the real estate development loan for the development and construction process and the operating property loan for the operation process. These two types of bank credit have strict restrictions on the use of loans. There will be not only strict examination before credit approval, but also strict post-loan supervision on the flow of funds after credit approval. Especially in the environment of strict supervision, even if the bank credit is obtained through operating property loans, the final capital flow cannot flow into the real estate field because of the strict restrictions on the use. Therefore, through the financing way of asset securitization, shopping mall and hotels effectively converts restricted funds into unrestricted funds, realizes credit conversion, improves the efficiency of liquidity fund management, and avoids the risk of illegal use of funds.

5.4.2   Potential risks of securitization programs

5.4.2.1 Policy risk

Policy risk not only has an important economic impact on asset securitization of small and medium-sized enterprises in China but may even cause the whole securitization program to run aground. Therefore, the implementation of asset securitization in small and medium-sized enterprises should not only improve the understanding of the objectivity and predictability of policy risks, but also fully estimate policy risks and make relevant decisions (Zhao, 2015 ; X. R. Deng et al., 2017).

In the past few years, policies aimed at the real estate industry have emerged one after another, but no policy has ever been more stringent than the "rules on Capital Monitoring and financing Management of key Real Estate Enterprises" issued on August 20, 2020. Although this policy is not officially seen in words, but only officially confirmed in the form of symposiums and press conferences, for the real estate industry, the policy is more shocking than any other policy. As shown in Annexes 5.56 and 5.57, the "three red lines" are the asset-liability ratio, net liability ratio and cash short-debt ratio excluding advance receipts. How much the red line touches will not only affect the scale of interest-bearing liabilities of real estate enterprises, but even determine the life and death of real estate enterprises that rely on highly leveraged growth.

The introduction of the " three red lines and four grades " policy is the first time that regulators have defined the standard for real estate enterprises to borrow. This policy directly connects its financing threshold and financing scale in financial institutions with corporate leverage, which completely changes the fuzziness of the previous financing policy of real estate enterprises, and completely closes the financing loopholes that can be followed in the past. The policy not only controls credit debt, but also regulates trusts, asset management products and overseas financing in an all-round way. As a result, many large real estate enterprises are driven to carry out strategic debt reduction actions. The implementation of the policy of " three red lines and four grades " will make the trend of solidification of the echelon class of real estate enterprises more obvious. This policy not only makes it more and more difficult for small and medium-sized real estate enterprises to climb upward across the class, but also has smaller assets or fewer high-quality assets. it also makes it difficult for small and medium-sized real estate enterprises to improve their financial situation by divesting and selling assets like large real estate enterprises. Therefore, the implementation of this policy directly makes small and medium-sized real estate enterprises basically lose the opportunity to enter the financing

threshold of financial institutions and become the first group to be abandoned under the policy risk.

5.4.2.2 Market risk

The "COVID-19" epidemic in 2020 had a significant impact on the global economy. In 2021, with the advance of the global vaccine and the gradual control of the global epidemic, the economies of all countries are recovering to varying degrees. Central banks and finance ministries around the world have released a lot of liquidity since 2020. From the perspective of capital inflows from major economies, capital inflows into the stock and bond markets of the United States and China have both reached record highs, significantly higher than in previous years. According to historical experience, the US tends to consider shrinking QE driven by abundant liquidity and optimistic economic prospects. In the case of economic recovery superimposed by rising inflation expectations, it will lead to a rise in interest rates in the bond market, which in turn transmits and affects China's bond market. As a result, China's bond market has to produce a series of reactions and actions. Often this kind of external environment changes through layers of transmission, and finally lead to significant uncertainty in the sales of asset securitization products of small and medium-sized enterprises.

As shown in Annexes 5.58, changes in the external environment combined with the uncertainty of two factors, policy risk and moral hazard of the credit system, often lead to the fact that even if an optimal asset securitization plan is designed, due to various factors in the issuance timing Uncertainty, resulting in securitized products cannot be sold normally.

From the above analysis, it can be seen that in addition to the complex design of asset securitization schemes and the need for the participation of many institutions in implementation, real estate enterprises are also more demanding than ordinary enterprises in terms of environment, policies and markets. Any problem in any link will cause SMEs to fail to sell their expectations in the final sales link of asset securitization. Therefore, in addition to considering the design and implementation of the asset securitization plan, it is also necessary to fully consider the boundaries before and after the implementation of the asset securitization plan.

5.4.2.3 Moral hazard of rating agencies

China's credit rating agencies, under the condition of the issuer payment model and the imperfect internal supervision system of credit rating agencies, lead to frequent false rating incidents, which induces the moral hazard of rating agencies. The "negative externalities" of scandals in the rating industry have led to questioning the credibility of asset-backed

securitization products (Anderson, 2019).

Since 2017, China's major rating agencies have committed several violations or even illegal records during the year. As shown in Annexes 5.59, although the major rating agencies are inconsistent in the reporting of violations and violations, they are directly related to the "money rating" and rating violations of the rated objects. In particular, on December 14, 2020, the CPC Central Commission for discipline Inspection released the corruption case of "Oriental Jincheng" executives "measuring money rating", the leading credit rating agency in the credit rating field, through the official website. It further reveals that there are widespread rent-seeking behaviors such as buying and selling rating results in the field of credit rating in China.

China's credit rating industry, such as inflated ratings on issuers and products, lack of access and elimination mechanism, and improper tracking of ratings, resulting in continuous punishment by regulators for violations or violations of the law. what's more, it has caused great doubts about the credibility of the whole rating industry. Because of its "negative externality", most investors who are unable to make a rational judgment on the complex product structure design and investment risk of asset securitization dare not try the asset securitization products of small and medium-sized real estate enterprises.

This chapter uses Company A as a typical case and designs an asset securitization program as follows: first, by analyzing the three types of assets of the company: commercial center, hotel and residential, the commercial center and hotel are finally selected as the underlying assets. Second, by combining the characteristics of the asset composition and low credit of the subject of the case company, the two types of bankruptcy isolation mean, trust structure and fund structure, were analyzed and the trust structure was finally chosen as the bankruptcy isolation means. Third, similarly combined with the characteristics of the asset composition and low subject credit of the case companies, the choice of credit enhancement means such as excess cash flow coverage and excess asset collateral, as well as the design of the preferred/inferior tranches, serve the purpose of relying on high quality underlying assets to increase internal credit enhancement and ultimately result in an overall asset securitization program. Finally, by carrying out asset securitization, while obtaining a financing scale of $1.6 billion, Company A achieved a 103BP reduction in overall financing costs and a 0.04% reduction in overall asset liability ratio of the company. Moreover, through the asset securitization Company A has also improved its capital structure and eased the debt servicing pressure.

[This page is deliberately left blank.]

[This page is deliberately left blank.]

Chapter 6: Conclusions

6.1 Research implications of asset securitization of small and medium real estate enterprises

6.1.1 Implement asset management classification and change the thinking mode based on enterprise financing as a whole

Under the policy background of strict control of real estate and the essence of direct financing of securitization, first of all, small and medium-sized real estate enterprises should pay attention to the classification of asset management and change the mode of thinking based on enterprise financing as a whole (Rothman, 2012). In the past, the financing of small and medium-sized real estate enterprises mainly relied on the main credit and bank credit financing based on the enterprise as a whole. Pay more attention to the enterprise's own background, the nature of the enterprise, the overall operation and financial situation of the enterprise. All kinds of underlying assets contained in the enterprise are only a part of the enterprise as a whole.

The implementation of asset securitization financing in small and medium-sized real estate enterprises mainly depends on asset credit, not on the subject credit of the enterprise as a whole. Therefore, in the case of the existence of multiple underlying assets, small and medium real estate enterprises should screen out the underlying assets that can implement asset securitization according to the characteristics of the underlying assets. And small and medium-sized real estate enterprises need to focus on the promotion of asset credit, take targeted resource allocation, financial segmentation and optimization, property rights carding and other measures for the underlying assets suitable for asset securitization. The underlying assets of small and medium-sized real estate enterprises are very different. At the present stage, small and medium-sized enterprises are more suitable to choose commercial and hotel underlying assets to implement asset securitization. The underlying assets of real estate enterprises mainly include housing, apartments, commerce, and hotels. In the practice of asset securitization of Chinese real estate enterprises, the cash flow generated by these underlying assets can be used for asset securitization, including the balance of house purchases, supply chain, rent, property fees and operating income. However, these underlying assets and the cash flows they generate are often not sustainable, stable, and predictable. Therefore, for small and medium-sized real estate enterprises, not all are suitable for asset securitization.

6.1.2 Tamp the assets that can bring stable cash flow and lay the foundation for the construction of the underlying asset pool of securitization

When selecting the underlying assets to enter the pool, we should strictly verify the availability, standardization and compliance of all kinds of underlying assets, and tamp the assets that can bring stable cash flow (Nadauld & Sherlund, 2013 ; Fahad & Laura, 2017).

First, it is necessary to conduct an all-round inspection of the quality of the underlying assets to avoid packaging the underlying assets with poor returns into the asset pool so as to reduce the risk of default. Use high-quality underlying assets with continuous and stable cash flow to build an asset pool to ensure the stability and safety of asset securitization products. Secondly, the cash flow related to the asset securitization business of the enterprise shall be listed separately in the statement, including the cash inflow and cash outflow of various underlying assets that can be securitized, and the various underlying assets of the enterprise before and after the asset securitization raises funds. The changes in funds are classified, collected and summarized. Make it clearly and accurately reflected in the relevant report data. In the balance sheet, the detailed accounts and the net income and expenditure of monetary funds under various underlying assets and monetary funds are added.   In the income statement, the income, costs, expenses, and profits of the assets related to all kinds of underlying assets are listed separately. At the same time, enterprises should also strengthen off-balance sheet disclosure and fully disclose useful information regularly or irregularly, so as to reduce information asymmetry and improve the transparency of operation. Through the above and other financial interventions, we can improve financial management and effectively avoid all kinds of financial risks at the same time. Finally, small, and medium-sized real estate enterprises generally choose to implement asset securitization programs based on income rights. Generally speaking, this kind of underlying assets is a special planned product program designed according to the forecast of future cash flow. There is a possibility that there will be a big deviation between the actual cash flow and the forecast cash flow in the future, which will affect the repayment of principal and interest of the asset securitization scheme. Therefore, for this kind of estimation of future income, it is necessary to establish a model to predict the cash flow of underlying assets based on of the existing data and the relevant factors that will affect the cash flow of underlying assets. In the case of great uncertainty in the forecast data caused by the difficulties in obtaining unknown factors and incomplete consideration of influencing factors, the cash flow generated by this kind of underlying assets should be predicted according to the scientific conversion coefficient, to be able to realize the cash flow of this kind of

underlying assets.

6.1.3   According to the optional means of bankruptcy remote, the structure is designed in advance

The characteristics of small and medium-sized real estate enterprises with low overall strength and small scale of operation determine that at the current stage, small and medium-sized real estate enterprises are more suitable for choosing the bankruptcy remote method of trust structure (S. Y. Zhang, 2013 ; Y. Chen & Ma, 2018 ; J. Y. Li, 2020).

First, the core of asset securitization products that small and medium-sized real estate enterprises choose trust structure for bankruptcy remote lies in the structural design that can build creditor's rights. The main source of funds for SME asset securitization products is future earnings, and these earnings belong to future claims, so there are problems in the specificity of underlying assets and the stability of cash flow. Therefore, to ensure the stability of future debt service cash flow, nested trusts are required for risk isolation. Secondly, in terms of tax and fee costs, the "creditor's rights" trust structure does not involve the transfer of real estate property rights, and is a mortgage-type asset securitization product, which will not trigger high tax payments due to the need to complete the delivery of the underlying assets. However, as the actual situation of each small and medium-sized real estate enterprises is different, if it involves income tax, land value-added tax, value-added tax, deed tax and real estate transaction fees paid by the real estate transfer link, it also needs to carry on the tax and fee planning in advance. Finally, in terms of credit enhancement means, the core of the credit enhancement means of trust structure lies in the mortgage of real estate, so it is more sensitive to the evaluation value and mortgage rate of real estate. Therefore, for small and medium-sized real estate enterprises with mortgage assets, the valuation of mortgage assets needs to be evaluated regularly to predict the peak value of securitization financing.

6.1.4   Keep dynamic follow-up evaluation around an open and transparent information disclosure mechanism

It is very important for small and medium-sized real estate enterprises to carry out continuous dynamic evaluation of the effect of asset securitization. Small and medium-sized real estate enterprises have changed from bank credit financing mode to asset securitization financing mode, which means that the financing mode has changed from two-way financing from enterprises to banks to public fundraising in the capital market (Qi et al., 2018 ; L. Xu et al.,

2019). As a result of this change, a variety of operational and financial information of small and medium-sized real estate enterprises will be fully disclosed and disclosed to the capital market. Through the establishment of a sound and transparent information disclosure mechanism, strengthening the holders' meeting system and the sense of responsibility of intermediary agencies, it is helpful to effectively prevent, identify and control potential risks. At the same time, product governance structures such as information disclosure and holder meeting system also enhance investors' evaluation and judgment of asset securitization products. Therefore, small, and medium-sized real estate enterprises should adjust the original inertia mode of operation, which only provides relevant business information and financial information to the bank and is only supervised by the bank. It should be adjusted to raise funds through asset securitization in the public capital market, and to dynamically evaluate the achievement of its main objectives and the sub-indicators achieved around the main objectives.

The main goal of asset securitization in small and medium-sized real estate enterprises is to invigorate the stock assets of enterprises and obtain the necessary financing funds to meet the needs of enterprise development. Around the main objectives, we need to focus on the dynamic evaluation of the enterprise's financial situation, capital structure, profitability, financing cost and investment behavior. Because small and medium-sized real estate enterprises have obtained funds after invigorating assets through asset securitization, to a certain extent, they can improve the utilization rate of funds, reduce financing costs, enhance profitability, and alleviate some short-term debt repayment pressure. However, the asset securitization of small and medium-sized real estate enterprises has not achieved the real termination recognition of underlying assets, therefore, the asset-liability ratio has not been substantially reduced. The increase in profits comes more from the reduction of financing costs. If the small and medium-sized real estate enterprises cannot achieve the desired development in the follow-up development, and the funds raised do not achieve the expected income after investment, it will affect the financial situation of enterprises and the implementation of asset securitization in the later stage. However, some matters and indicators that small and medium-sized real estate enterprises did not pay too much attention to before were fully interpreted and analyzed by the capital market due to the financing behavior of the public capital market. The transparency and dissemination of information will often affect the judgment and decision of the capital market and investors on the enterprise, and then affect the follow-up implementation of asset securitization. Therefore, after the implementation of asset securitization to achieve the main objectives of financing, small and medium-sized real estate enterprises should make a full dynamic evaluation of each sub-index around the main objectives to ensure the implementation

effect of asset securitization in the later stage.

6.2 Conclusions and contributions

6.2.1 Conclusions

The reform of the housing system in 1998 unleashed the huge potential of real estate marketization in China. It contributed to the brilliant achievements of large-scale urbanization and rapid economic growth, but also led to the real estate bubbles, bank credit risks, high housing prices and land finance waiting to be solved. In the economic context of prevention and control of systemic financial risks and strict regulation of bank credit for real estate in China, as well as the financial context of deepening financial system reform and vigorous development of direct financing, the real estate market regulation has formed a gradually tightened trend. It has become more difficult for Chinese real estate enterprises to raise capital which have long been mainly financed by bank borrowings. Therefore, it is urgent to explore a financing method that meets both economic and financial reform background.

For the purpose of research, the questions are previously put forward as follows:

First, How to propose a direct financing channel for small and medium-sized real estate companies in line with the direction of dual economic and financial reforms, based on the economic background of strict regulation and control of the real estate industry and the background of vigorous development of the financial system of direct financing in China, through an analysis of the necessity and feasibility of securitization financing for small and medium-sized companies？

Second, how to design a securitization program including underlying asset pool construction, choice of bankruptcy remote and credit enhancement means, and product tranches based on the asset composition status of small and medium-sized real estate companies and the low credit rating characteristics of the subject, through typical case studies?

The following conclusions are drawn from the data collection, data analysis and program design of the asset securitization program for the shopping mall and hotel projects.

(1) The asset credit can replace subject credit for the asset securitization. The assets that lack liquidity but are expected to generate stable cash flows could be restructured into the securitized products that can be traded and circulated in the capital market. Thus, the huge stock of assets of real estate enterprises could be revitalized while the financing achieved. Moreover, the asset credit could replace bank credit for the asset securitization, which has the function of

transforming indirect financing into direct financing to effectively reduce financing risks and change the traditional bank-led indirect financing financial system. Therefore, asset securitization is a financing method that meets both the economic and financial reform background. The implementation of asset securitization by small and medium-sized real estate enterprises has its necessity and feasibility. On the one hand, the necessity of implementing asset securitization for small and medium-sized real estate enterprises lies in the fact that the economy in China is overly dependent on the real estate industry, attracting a large amount of social capital and bank loans into the real estate industry and forming the situation where one industry thrives while others fail. The unbalanced financing structure, high macro leverage ratio, continuous growth of loans to the real estate industry and its high correlation with China's macro leverage ratio have indirectly pushed up the real estate price bubbles and become the main source of hidden systemic financial risks in China. As a result, China has shifted its economic growth from investment-driven to innovation-driven. It could be found that the real estate industry goals are related to both the economic transformation and development in China and the stability of China's financial system. Therefore, it is inevitable to increase the proportion of direct financing for real estate enterprises and encourage capital to move from the fictitious economy to the real economy. As an innovative financing tool, asset securitization can not only help banks and enterprises to quickly liquidate their stock assets but also realize direct financing to reduce leverage ratio, thus meeting the innovative financing needs of small and medium-sized real estate enterprises. On the other hand, the feasibility of implementing asset securitization for small and medium-sized real estate enterprises lies in the fact that policies at all levels strongly support the asset securitization, and the internal environment for real estate asset securitization is mature and feasible both in terms of macro-level policies and data and in terms of micro-specific operations. The year-on-year rise in the issue scale of real estate asset securitization reflects the reliance of real estate enterprises on financing and the concentration of channel selection through asset securitization, showing that it is feasible to draw on the experience of various types of real estate asset securitization in the market. The research and analysis of the underlying assets of small and medium-sized real estate shows that the underlying assets of small and medium-sized real estate enterprises have stable and continuously growing cash flow, hence it is feasible to select the underlying assets of small and medium-sized real estate enterprises for asset securitization.

(2) Based on historical data, the trend and structure characteristics of cash flows of three typical underlying assets of Company A are analyzed, including shopping malls, hotels and residences, and it is found that the underlying assets with stable and sustainable cash flows

could be screened out among small and medium-sized real estate enterprises. The cash flows of the underlying assets suitable for securitization is predicted through a financial planning model based on the fixed proportional growth method, so as to obtain the amount of overall cash flows available for securitization in the pool of underlying assets in the next few years. On the basis of the clarification of financing amount, financing cost and financing risks, the means of bankruptcy remote, credit rating and credit enhancement, product stratification and repayment methods suitable for small and medium-sized real estate enterprises are selected in combination with the characteristics of small and medium-sized real estate enterprises and the underlying assets, and then the asset securitization products suitable for small and medium-sized real estate enterprises are designed. The analysis of implementing asset securitization for small and medium-sized real estate enterprises shows that the asset securitization for small and medium-sized real estate enterprises can not only meet the financing needs under strict regulation, but also optimize financial statement and improve operation management. However, it is a prerequisite for asset securitization for small and medium real estate companies to have high-quality underlying assets. And the implementation of asset securitization by small and medium-sized real estate enterprises should take into consideration their own risk boundary control ability with respect to policy risk, moral hazard, and market risk, in addition to the program design and implementation. Only by fully considering the above factors and conducting the comprehensive assessment can we ensure that small and medium-sized real estate enterprises implement asset securitization smoothly and safely. Otherwise, small and medium real estate companies that cannot meet the above conditions will not be able to successfully implement asset securitization.

6.2.2　Main contributions

(1) The asset securitization is a common financing tool used by many large real estate enterprises. However, in the economic context of the prevention and control of systemic financial risks and strict regulation of real estate bank credit in China, as well as the financial context of deepening financial system reform and vigorously developing direct financing, it is of realistic value for diversified small and medium-sized real estate enterprises to explore asset securitization financing based on high-quality assets rather than corporate main credit.

In the case of the company A, a small and medium-sized real estate company, the underlying assets consist of three types of assets: commercial centers, hotels, and residential properties. However, only the two underlying asset classes, commercial centers, and hotels,

both generate cash flows that are characterized by continuity and stability. In contrast, residential assets are realized through rapid sales, which are characterized by high turnover. Large real estate companies have a greater proportion of their underlying assets in the residential category. Therefore, this is the main difference between small and medium-sized real estate companies and large real estate companies in terms of underlying assets. Moreover, small, and medium-sized real estate enterprises cannot compare with large real estate enterprises in terms of credit entities. The above differences lead to different choices of asset securitization instruments such as underlying asset pool construction, bankruptcy remote, credit enhancement and tranche design for the two different sizes of real estate companies. Therefore, this paper has a practical relevance to the study of small and medium-sized real estate enterprises using asset securitization solutions for financing.

(2) Combined with the literature, there is more research in the existing literature on large real estate companies and REITs in real estate securitization. Furthermore, the financing risk, yield, volatility, and role of asset securitization are mainly studied empirically from a quantitative perspective. However, there is a lack of research on the securitization of assets of small and medium-sized real estate enterprises as well as non-REITs. Therefore, this thesis has theoretical implications for the research of the use of asset securitization by small and medium-sized real estate enterprises for financing.

6.3 Research limitations

Considering that small and medium-sized real estate enterprises in China have not yet carried out the comprehensive asset securitization practice, the thesis resorts to the methods of simulation and substitution to obtain the basic data and facts and concludes that small and medium-sized real estate enterprises prefer the debt-based CMBS model for asset securitization. However, the financing scale of CMBS model is limited by the collateral rate of assets with the real bankruptcy remote and off-balance asset sheet not realized. If the Quasi-REITs model is chosen, the financing scale is not limited by the collateral   rate but can achieve true bankruptcy remote and off-balance asset sheet. However, the complex transaction structure and excessive tax burden of Quasi-REITs transactions discourage most small and medium-sized real estate enterprises. In particular, the transfer of the underlying assets to the SPV in the transaction structure, as well as the resulting land value added tax and corporate income tax, will result in the higher the cost of issuing REITs for assets with a larger securitization space and capital increase ratio. The real estate enterprises are often forced to use more complex structures such

as reverse absorption mergers for the purpose of tax avoidance and capital weakening. These problems can lead small and medium-sized real estate enterprises to pay too much for asset securitization and eventually to give up the asset securitization. Therefore, the current asset securitization is still not applicable for some small and medium-sized real estate enterprises. The further exploration should focus on how to create and develop asset securitization more suitable for China's national condition and small and medium-sized real estate enterprises according to the national condition, the operating mechanism of the securities market, and the financial structure and operating characteristics of small and medium-sized real estate enterprises.

Due to the constraints of multiple factors, the study of the securitization program for small and medium-sized real estate enterprises in China should continue to be further explored in several directions, including but not limited to: considering that the implementation of asset securitization for small and medium-sized real estate enterprises is a systematic project, the related theoretical issues need to be further studied and a series of regulations to be established and improved to accompany it. The relevant theories covering the economies of scale of securitization of small and medium-sized real estate enterprises, the impact on institutional investors, and the influence on the taxation system of asset securitization call for the further theoretical exploration. Meanwhile, it is necessary to implement laws and regulations in terms of the institutional aspects including the property rights of underlying assets, taxation policies and operation regulation. The analysis of theories would provide a theoretical basis for the nation to formulate relevant policies, which is to be further improved in the future research of the thesis.

[This page is deliberately left blank.]

[This page is deliberately left blank.]

Bibliography

Affinito, M., & Tagliaferri, E. (2010). Why do (or did?) banks securitize their loans? evidence from italy. *Journal of Financial Stability, 6*(4), 189-202.

Agarwal, S., Chang, Y., & Yavas, A. (2012). Adverse selection in mortgage securitization. *Journal of Financial Economics, 105*(3), 640-660.

Agostino, M., & Mazzuca, M. (2008). Why do banks securitize? The case of italy. *Ssrn Electronic Journal, 9*(1), 18-38.

Anderson, A. G. (2019). Ambiguity in securitization markets. *Journal of Banking & Finance, 102*(5), 231-255.

Ba, S. S., & Niu, B. K. (2013). 利率市场化与资产证券化兴起：来自美国经验的启示 [Interest rate marketization and the rise of asset securitization: enlightenment from american experience]. *Journal of Hubei University of Economics, 11*(5), 5-19.

Battaglia, F., & Gallo, A. (2013). Securitization and systemic risk: an empirical investigation on italian banks over the financial crisis. *International Review of Financial Analysis, 30*(12), 274-286.

Beck, T. (2007). Financing constraints of SMEs in developing countries: evidence, determinants and solutions. *Journal of The American College of Cardiology, 1*(4), 1-35.

Beck, T., Chen, T., Lin, C., & Song, F. M. (2016). Financial innovation: the bright and the dark sides. *Journal of Banking & Finance, 72*(11), 28-51.

Beijing municipal bureau of statistics [BMBS]. (2018, December 31). *Tourism statistics 2018.* Beijing municipal bureau of statistics. Retrieved May 10, 2022, from http://tjj.beijing.gov.cn/tjsj_31433/yjdsj_31440/ly_32068/2018/

Beltran, D. O., Cordell, L., & Thomas, C. P. (2017). Asymmetric information and the death of ABS CDOs. *Journal of Banking & Finance, 76*(3), 1-14.

Benmelech, E., & Dlugosz, J. (2010). The credit rating crisis. *NBER Macroeconomics Annual, 24*(12), 161-208.

Bent, F. (2006). Five misunderstandings about case-study research. *Qualitative Research Practice, 12*(11), 420-434.

Benveniste, L. M., & Berger, A. N. (1987). Securitization with recourse: an instrument that offers uninsured bank depositors sequential claims. *Journal of Banking & Finance, 11*(3), 403-424.

Berger, A. N., & Udell, G. F. (2002). Small usiness credit availability and relationship lending: the importance of bank organisational structure. *The Economic Journal, 112*(477), 32-53.

BMPS. (2019, December 31). *Tourism statistics 2019.* BMPS. Retrieved May 10, 2022, from http://tjj.beijing.gov.cn/tjsj_31433/yjdsj_31440/ly_32068/2019/

Bolton, P., Dargallo, X., & Shapiro, J. (2009). The credit ratings game. *The Journal of Finance, 67*(1), 85-111.

Boot, A. W., Milbourn, T. T., & Schmeits, A. (2006). Credit ratings as coordinated mechanisms. *The Review of Financial Studies, 19*(1), 81-118.

Brunnermeier, M. K. (2009). Deciphering the liquidity and credit crunch 2007-2008. *The Journal of Economic Perspectives, 23*(1), 77-100.

Brunnermeier, M. K., & Sannikov, Y. (2014). A macroeconomic model with a financial sector. *American Economic Review, 104*(2), 379-421.

Bubb, R., & Kaufman, A. (2014). Securitization and moral hazard: evidence from credit score cutoff rules. *Journal of Monetary Economics, 63*(4), 1-18.

Calem, P. S., & LaCour-Little, M. (2004). Risk-based capital requirements for mortgage loans. *Journal of Banking & Finance, 28*(3), 647-672.

Case, K. E., & Shiller, R. J. (2003). Is there a bubble in the housing market? *Brookings Papers on Economic Activity, 2003*(2), 299-342.

Casu, B., Clare, A., Sarkisyan, A., & Thomas, S. (2013). Securitization and bank performance. *Journal of Money, Credit and Banking, 45*(8), 1617-1658.

Central Committee of the Communist Party of China. (2017). *Report at the 19th national congress of the communist party of china,   CHN (Report No. CHN 18/10/2017)*

Chen, X. M., Fan, D. Q., & Lin, Y. (2018). Real estate asset securitization application model. *Communication of Finance and Accounting,* (5), 23-27.

Chen, X. S. (2019). Default risk, real estate loan market game and real estate prices. *Statistical Research, 36*(4), 84-94.

Chen, Y., & Ma, L. (2018). The taxation of special purpose vehicles in asset securitization. *Taxation Research, 1*(1), 122-126.

China real estate evaluation center. (2019, December 2022). *Report on urban housing rental price index in China.* China real estate evaluation center. Retrieved May 10, 2022 from http://www.fangchan.com/news/1/2020-01-09/6620859143035359826.html

China Securities Regulatory Commission [CSRC]. (2018, December 31). *Issuance scale and enterprise share of different issuance methods of real estate asset securitization products in China.* China Securities Regulatory Commission. Retrieved May 10, 2022, from https://www.cn-abs.com/

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design : choosing among five traditions fourth edition*. Sage Publications.

Criado, S., & Rixtel, A. V. (2008). Structured finance and the financial Turmoil of 2007-2008: an Introductory overview. *Social Science Electronic Publishing, 1*(808), 1-45.

CSRC. (2018, December 31). *Issuance scale of China's real estate asset securitization over the years in 2015 to 2018.* CSRC. Retrieved May 10, 2022, from https://v1.cn-abs.com/

Cushman & Wakefield. (2019, December 31). *Beijing retail market report for the first quarter of 2019.* Cushman & Wakefield. Retrieved May 10, 2022, from http://admin.fangchan.com/uploadfile/uploadfile/annex/2/301/5c2328b3999c3.pdf

Daley, B., Green, B., & Vanasco, V. (2017). Securitization, ratings, and credit supply. *Journal of Finance, 75*(2), 1037-1082.

DeMarzo, P. M. (2004). The pooling and tranching of securities: s model of Informed Intermediation. *The Review of Financial Studies, 18*(1), 1-35.

Deng, R. (2012). Thoughts on solving the problem of Local debt by asset securitization. *Chinese Securities and Futures,* (4), 42-43.

Deng, X. R., Zhang, J. M., & Jia Ming, Z. (2017). 危机视角下欧洲中小企业贷款证券化研究的新进展 [New development of research on european SME loan securitization from the perspective of financial crises]. *Comparison of Economic and Social Systems,* (3), 117-126.

Dionne, G., & Harchaoui, T. (2007). Bank capital, securitization and credit risk: an empirical evidence. *MPRA Paper, 75*(4), 459-485.

Efing, M., & Hau, H. (2015). Structured debt ratings: Evidence on conflicts of interest. *Journal of Financial Economics, 116*(1), 46-60.

Fabozzi, F. J., Bhattacharya, A. K., & Berliner, W. S. (2011). *Mortgage-backed securities :products, structuring, and analytical techniques, 2nd Edition*. John Wiley & Sons, Inc.

Fabozzi, F. J., & Modigliani, F. (1996). Capital markets: institutions and instruments. *Journal of Finance, 47*(5), 2071.

Fahad, N. U., & Laura, M. R. (2017). Complexity in structured finance and difficulties faced by market participants-a critical assessment of the role of the complexity in financial crisis. *Asian Economic and Financial Review, 7*(9), 907-920.

Fan, C., & Wang, X. Q. (2016). House price-lasting income ratio in 35 large and medium-sized

cities in China. *Statistical Research, 33*(8), 95-100.

Fang, J. (2015). The impact of real estate asset securitization on the development model of enterprise industry-financing combination. *Construction Economics, 36*(12), 59-62.

Fang, J., Ma, Y. K., & Li, H. L. (2003). 我国中小企业债券融资模式探讨 [Study of bond financing mode for chinese SMEs' enterprise]. *China Soft Science,* (10), 52-57.

Farruggio, C., & Uhde, A. (2015). Determinants of loan securitization in european banking. *Journal of Banking & Finance, 56*(7), 12-27.

Financial Crisis Inquiry Commission. (2011). *The financial crisis inquiry report, American (Report No. CHN 1/2011)*

Frost, C. W. (1997). Asset securitization and corporate risk allocation. *Tulane Review, 72*(1), 101-157.

Gardener, E. P. M. (1991). *Capital adequacy in the new europe*. Instituto Valenciano de Investigaciones Económicas.

Ghent, A. C., Torous, W. N., & Valkanov, R. I. (2019). Complexity in structured finance. *The Review of Economic Studies, 86*(2), 694-722.

Gomm, R., Hammersley, M., & Foster, P. (2000). *Case study methods*. Sage Publications.

Gorton, G. (2008). The panic of 2007. *NBER Working Paper, No. 14358*.

Gorton, G., & Pennacchi, G. (1990). Financial intermediaries and liquidity creation. *Journal of Finance, 45*(1), 49-71.

Graham, B., & Dodd, D. (2008). *Security analysis sixth edition*. McGraw-Hill.

Greenbaum, S. I., & Thakor, A. V. (1987). Bank funding modes: securitization versus deposits. *Journal of Banking & Finance, 11*(3), 379-401.

Griffin, J. M., & Maturana, G. (2016). Who facilitated misreporting in securitized loans? *The Review of Financial Studies, 29*(2), 384-419.

Grossman, S. J., & Stiglitz, J. E. (1980). On the impossibility of informationally efficient markets. *American Economic Review, 70*(3), 393-408.

Guan, C. (2018). A research on the impact of rating payment model on rating quality. *Journal of Nanjing audit university, 15*(5), 94-102.

Guo, C. S., & Xie, J. Q. (2015). Liquidity risk and supervision mode of bank credit asset securitization-- an analysis from the perspective of system synergy theory. *Financial Regulation Research,* (12), 16-30.

Guo, J. Q. (2016). Thoughts on the development of CMBS in China. *China Finance,* (3), 60-61.

Hau, H., Langfield, S., & Marques-Ibanez, D. (2012). Bank ratings: what determines their quality? *Social Science Electronic Publishing, 28*(74), 289-333.

He, Y., Wang, J., & Wei, K. C. J. (2011). Do bond rating changes affect the information asymmetry of stock trading? *Journal of Empirical Finance, 18*(1), 103-116.

Hess, A. C., & Smith Jr, C. W. (1988). Elements of mortgage securitization. *Journal of Real Estate Finance & Economics, 1*(4), 331-346.

Hou, J. (2017). *The lack of credit of small and medium-sized enterprises in China* [Master thesis]. Hebei University of Economics and Business.

Huang, C. (2020). The influence of management tone on bond credit rating and issuance spread. *Journal of Shanghai Lixin University of Accounting and Finance, 32*(04), 3-13.

Huang, H. Y. (2010). On the analysis and perfection of the "real sale" of asset securitization in China. *Law Science, 31*(10), 142-144.

Huang, X. L., Zhu, S., Chen, G. T., Song, Z. H. U., & Guanting, C. (2017). The impact of bond default on credit rating agencies: analysis based on bond default in chinese bond market. *Journal of Financial Research,* (3), 130-144.

Iacobucci, E. M., & Winter, R. A. (2005). Asset securitization and asymmetric information. *The Journal of Legal Studies, 34*(1), 161-206.

Jiang, X. F. (2008). Beating earnings benchmarks and the cost of debt. *Accounting Review, 83*(2), 377-416.

Jin, Y. J., Liu, B., & Shen, W. H. (2021). The check and balance mechanism of overseas contractual REITs and its enlightenment to China. *Shanghai Finance,* (5), 2-11.

Jobst, A. (2005). What is structured finance. *The Securitization Conduit, 8*(6), 1-14.

John, K., Lynch, A. W., & Puri, M. (2003). Credit ratings, collateral, and loan characteristics: implications for yield. *The Journal of Business, 76*(3), 371-409.

Keys, B. J., Mukherjee, T., Seru, A., & Vig, V. (2009). Financial regulation and securitization: evidence from subprime loans. *Journal of Monetary Economics, 56*(5), 700-720.

Keys, B. J., Mukherjee, T., Seru, A., & Vig, V. (2010). Did securitization lead to lax screening? evidence from subprime loans. *The Quarterly Journal of Economics, 125*(1), 307-362.

Keys, B. J., Seru, A., & Vig, V. (2012). Lender screening and the role of securitization: evidence from prime and subprime mortgage markets. *The Review of Financial Studies, 25*(7), 2071-2108.

Kong, D. P. (2021). Recent advances in asset securitization in China: characterizing facts, drivers and key issues. *Financial Market Research,*(5), 15-31.

Kou, Z. L., Pan, Y. Z., & Liu, X. Y. (2015). Does China's credit rating really affect the cost of issuing bonds? *Journal of Financial Research,* (10), 81-98.

Kroszner, R. S., & Strahan, P. E. (2011). Financial regulatory reform: challenges ahead. *American Economic Review, 101*(3), 242-246.

Lancaster, B. P., Schultz, G. M., & Fabozzi, F. J. (2008). *Structured products and related credit derivatives: a comprehensive guide for investors*. John Wiley & Sons Inc.

Lauretta, E. (2018). The hidden soul of financial innovation: an agent-based modelling of home mortgage securitization and the finance-growth nexus. *Economic Modelling, 68*(1), 51-73.

Lawson, T. (2009). The current economic crisis: its nature and the course of academic economics. *Cambridge Journal of Economics, 33*(4), 759-777.

Lei, X. H., Ren, G. D., & Guo-Dong, R. E. N. (2005). 基于资产证券化原理的中小企业融资研究 [Securitization on financing of small-and medium-sized enterprises]. *Shanghai Management Science, 27*(3), 45-47.

Li, H. F. (2018). Credit rating, reputation mechanism and financing cost of Leasing asset securitization. *Future and Development, 42*(01), 46-53.

Li, J. (2014). Liquidity expansion of asset securitization: theoretical basis, effects and defects. *Finance & Economics,* (04), 11-21.

Li, J. (2015). The emergence, operation and regulatory trend of asset securitization-- based on the experience of american market. *Shanghai Journal of Economics,* (07), 28-35.

Li, J. B., Xu, X. C., Jia, H., & Li, G. (2015). The effect of real estate economy on the growth of China's national economy. *Social Science on China Press,* (1), 84-101.

Li, J. Y. (2020). Legal research on asset securitization of small and medium-sized. *CO-Oerativeconomy & Science,* (1), 188-189.

Li, P. J., & Fan, R. Y. (2019). The background, connotation and influence of Financial supply-side structural reform. *International Finance,* (6), 58-64.

Li, Y. J. (2011). *Research on the relationship and coordinated development between China's real estate industry and national economy* [Doctoral dissertation]. Dongbei University of Finance and Economics.

Li, Y. L. (2019). 资产证券化风险管控——基于次贷危机案例研究 [Asset securitization risk control - based on the case of subprime mortgage crisis]. *Southwest Finance,* (5), 12-20.

Lin, H. (2009). 基于资产证券化的中小企业融资途径研究 [Research on financing ways of small and medium-sized enterprises based on asset securitization]. *Productivity Research,* (24), 222-224.

Liu, C., Liu, C., & Ma, G. G. (2017). Small and medium-sized Financial institutions and SME loans. *Economic Research Journal, 52*(08), 65-77.

Liu, G. P., Han, A. S., & Chang, X. Y. (2018). 存量房转化为租赁房的 REITs 运作模式研究 [REITs operation mode of transforming stock housing into rental housing]. *Modernization of Management, 38*(4), 82-85.

Liu, H. (2013). A comparison of the two great global crises. *Management World,* (3), 1-7.

Liu, J. (2017). *Research on financing risk of remaining mortgage asset securitization* [Master thesis]. Tianjin University of Finance and Economics.

Liu, X. J., & Zhang, Q. (2012). 我国信用评级行业声誉约束的实证分析 [An empirical analysis of reputation mechanism of China's credit rating industry]. *Journal of Hunan University of Science and Technology (Social Science Edition), 15*(4), 87-90.

Liu, X. T., & Yang, D. K. (2016). An empirical Analysis of the factors affecting the issuing interest rate of asset securitization products in China-- based on the comparison of the difference of credit spread between ABS and CLO. *Journal of Financial Research, 37*(11), 162-168.

Loutskina, E. (2011). The role of securitization in bank liquidity and funding management. *Journal of Financial Economics, 100*(3), 663-684.

Loutskina, E., & Strahan, P. E. (2009). Securitization and the declining Impact of bank finance on loan supply: evidence from mortgage acceptance rates. *NBER Working Paper, NO. 11983*.

Lumpkin, S. (1999). Trends and developments in securitization. *Financial Market Trends, 74*(1), 25-57.

Lv, J. S. (2015). On financing constraints of small and medium enterprises. *Journal of Financial Research,* (11), 115-123.

Ma, Y., & Chen, Y. L. (2017). Financial leverage, leverage fluctuation and economic growth. *Economic Research Journal, 52*(6), 31-45.

Mählmann, T. (2008). Rating agencies and the role of rating publication rights. *Journal of Banking & Finance, 32*(11), 2412-2422.

Malekan, S., & Dionne, G. (2014). Securitization and optimal retention under moral hazard. *Journal of Mathematical Economics, 55*(12), 74-85.

Mathis, J., McAndrews, J., & Rochet, J. C. (2009). Rating the raters: are reputation concerns powerful enough to discipline rating agencies? *Journal of Monetary Economics, 56*(5), 657-674.

Mei, D. Z., Wen, X. C., & Wang, S. Q. (2021). House price regulation, local government debt and macroeconomic fluctuation. *Journal of Financial Research,* (1), 31-50.

Michalak, T. C., & Uhde, A. (2012). Credit risk securitization and bank soundness in europe. *The Quarterly Review of Economics and Finance, 52*(3), 272-285.

Min, J., Baoyu, Y., & Hongjin, L. (2017). Leverage structure, level and financial stability-- theoretical analysis framework and chinese experience. *Journal of Financial Research,* (2), 11-25.

Ministry of Industry and Information Technology. (2011, June 11). *Notice on printing and distributing the provisions on the classification standards for small and medium-sized enterprises.* Ministry of Industry and Information Technology,. Retrieved May 10, 2022, from http://www.gov.cn/zwgk/2011-07/04/content_1898747.htm

Minton, B. A., Stulz, R., & Williamson, R. (2009). How much do banks use credit derivatives to hedge loans? *Journal of Financial Services Research, 35*(1), 1-31.

Mishkin, F. (2012). *The economics of money, banking and financial markets (Global, Tenth ed.).* Pearson Education Limited.

Mountain, J. R. (2008). Securitization accounting: are you ready for the credit crunch challenge. *Bank Accounting & Finance, 21*(3), 3-10.

Nadauld, T. D., & Sherlund, S. M. (2013). The impact of securitization on the expansion of subprime credit. *Journal of Financial Economics, 107*(2), 454-476.

National Bureau of Statistics [NBS]. (2017, December 31). *Statistical bulletin of national economic and social development of the people's republic of china 2017.* National Bureau of Statistics. Retrieved May 10, 2022, from http://www.stats.gov.cn/tjsj/zxfb/201802/t20180228_1585631.html

NBS. (2017, December 31). *Chart of growth rate trend of real estate investment and social fixed assets investment in 2004-2017.* NBS. Retrieved May 10, 2022, from https://data.stats.gov.cn/easyquery.htm?cn=A01&zb=A0601&sj=200412

NBS. (2018a, December 31). *Trend of average room rate and occupancy rate of four-star and five-star hotels in China 2015-2018.* NBS. Retrieved May 10, 2022, from https://www.sohu.com/a/454422003_677526

NBS. (2018b, December 31). *Sources of real estate enterprise development funds in 2018.* NBS. Retrieved May 10, 2022, from https://data.stats.gov.cn/easyquery.htm?cn=A01&zb=A0602&sj=202203

NBS. (2018c, December 31). *Trend of China's urban rental price index.* NBS. Retrieved May 10, 2022, from https://data.stats.gov.cn/search.htm?s=%E4%B8%AD%E5%9B%BD%E5%9F%8E%E5%B8%82%E7%A7%9F%E8%B5%81%E4%BB%B7%E6%A0%BC%E6%8C%87%E6%95%B0

NBS. (2018d, December 31). *Trend of average room rate and occupancy rate of star-related hotels in China* NBS. Retrieved May 10, 2022, from https://www.sohu.com/a/454422003_677526

NBS. (2018e, December 31). *Real estate inventory area and sales cycle in 2004-2018.* NBS. Retrieved May 10, 2022, from https://data.stats.gov.cn/search.htm?s=%E5%95%86%E5%93%81%E6%88%BF%E9%94%80%E5%94%AE%E9%9D%A2%E7%A7%AF2018

NBS. (2018f, December 31). *Leverage ratio trend chart in 2004-2018.* NBS. Retrieved January 5, 2022, from https://data.stats.gov.cn/search.htm?s=%E8%B4%B7%E6%AC%BE%E4%BD%99%E9%A2%9D2008

NBS. (2018g, December 31). *Proportion of real estate added value in secondary and tertiary industries.* NBS. Retrieved April 2, 2022, from https://data.stats.gov.cn/search.htm?s=%E7%AC%AC%E4%BA%8C%E4%BA%A7%E4%B8%9A%E5%A2%9E%E5%8A%A0%E5%80%BC1999

NBS. (2018h, December 31). *China's GDP in 1999-2018.* NBS. Retrieved April 1,2022, from http://www.stats.gov.cn/tjsj/zxfb/201802/t20180228_1585631.html

NBS. (2018i, December 31). *Balance of interest-bearing debts served as the main financing channels of real estate enterprises in 2018.* NBS. Retrieved May 10, 2022, from https://data.stats.gov.cn/easyquery.htm?cn=C01&zb=A020G0602&sj=2021

NBS. (2018j, December 31). *Chart of proportion and growth rate trend of real estate loans in 2011-2018.* NBS. Retrieved March 4, 2022, from https://data.stats.gov.cn/easyquery.htm?cn=A01&zb=A0602&sj=201112

NBS. (2019, December 31). *Trend chart of urban graded rental price index.* NBS. Retrieved May 10, 2022, from https://www.sohu.com/a/309601284_99890666

Opp, C. C., Opp, M. M., & Harris, M. (2013). Rating agencies in the face of regulation. *Journal of Financial Economics, 108*(1), 46-61.

Ou, Y. Q. (2016). The background and countermeasures of the restart of securitization of non-performing credit assets. *New Finance,* (5), 60-63.

Parlour, C. A., & Plantin, G. (2008). Loan sales and relationship banking. *The Journal of*

Finance, 63(3), 1291-1314.

Partnoy, F. (2009). Overdependence on credit ratings was a primary cause of the crisis. *Fondazione Eni Enrico Mattei,* (7), 175-191.

Pavel, C., & Phillis, D. (1987). Why commercial banks sell loans: an empirical analysis. *Proceedings, 11*(7), 3-14.

PBOC. (2020a, December 31). *Notice on establishing banking financial institutions real estate loan concentration management system.* PBOC. Retrieved from http://www.gov.cn/zhengce/zhengceku/2021-01/01/content_5576085.htm

PBOC. (2020b, December 31). *Financial market statistics.* PBOC. Retrieved May 10, 2022, from
http://www.pbc.gov.cn/diaochatongjisi/116219/116319/3959050/3959054/index.html

Poterba, J. M., Weil, D. N., & Shiller, R. (1991). House price dynamics: the role of tax policy and demography. *Brookings Papers on Economic Activity, 1991*(2), 143-203.

Purnanandam, A. (2011). Originate-to-distribute model and the subprime mortgage crisis. *The Review of Financial Studies, 24*(6), 1881-1915.

Qi, Y., Liao, K. Z., Liu, X., Feng, X. R., Liao, K., Liu, X., & Feng, X. (2018). 创新创业背景下科技型中小企业融资模式研究——基于知识产权质押贷款 ABS 模式的探讨 [Research on financing mode of technology: based SMEs under the background of innovation and entrepreneurship based on the ABS model of intellectual property mortgage loan]. *Science and Technology Management Research, 38*(18), 127-132.

Qian, L. (2015). Information asymmetry and credit risk mitigation mechanism of small and medium-sized enterprises. *Journal of Financial Research,* (10), 115-132.

Quigley, J. M. (1999). Real estate prices and economic cycles. *UC Berkeley: Berkeley Program on Housing and Urban Policy, 2*(1), 1-20.

Rajan, U., Seru, A., & Vig, V. (2015). The failure of models that predict failure: distance, incentives, and defaults. *Journal of Financial Economics, 115*(2), 237-260.

Research Center for National Balance Sheet. (2018, December 31). *Data of China's macro leverage ratio.* Research Center for National Balance Sheet. Retrieved May 10, 2022, from http://114.115.232.154:8080/

Richard, C., & Stanislas, R. (2000). Another perspective on credit risk transfer and asset securitization. *The Journal of Risk Finance, 1*(2).

Riddiough, T. J. (1997). Optimal design and governance of asset-backed securities. *Journal of Financial Intermediation, 6*(2), 121-152.

Riportella, C. C., Medina, R. S., & Ponce, A. T. (2010). What drives bank securitisation? The Spanish experience. *Journal of Banking & Finance, 34*(11), 2639-2651.

Roberts, M. R. (2015). The role of dynamic renegotiation and asymmetric information in financial contracting. *Journal of Financial Economics, 116*(1), 61-81.

Rosenthal, J. A., & Ocampo, J. M. (1988). *Securitization of credit: inside the new technology of finance.* McKinsey & Company, Inc.

Rothman, S. J. (2012). Lessons from general growth properties: the future of the special purpose entity. *Fordham Journal of Corporate & Financial Law, 17*(12), 227-260.

Schwarcz, S. L. (1994). Alchemy of asset securitization. *Stanford Journal of Law, Business & Finance, 1*(1), 133-154.

Schwarcz, S. L. (2013). *Securitization and structured finance.* Academic Press.

Schwartz, H. (2012). Housing, the welfare state, and the global financial crisis. *Politics & Society, 40*(1), 35-58.

Seitz, N., & Ellison, M. (2005). *Capital budgeting and long-term financing decisions 3rd Edition.* South-Western/Thomson Learning.

Shen, H. B., & Liao, G. M. (2014). Can credit rating agencies provide incremental information-- an empirical test based on short-term financing bonds. *Finance & Trade Economics,* (8),

62-70.

Shen, S., & Chen, Y. (2017). A comparative study on the payment model of bond credit rating in China. *New Finance,* (6), 36-42.

Shenker, J. C., & Colletta, A. J. (1991). Asset securitization: evolution, current issues and new frontiers. *Texas Law Review, 69*(6), 1369-1429.

Shin, H. S. (2009). Securitisation and financial stability. *The Economic Journal, 119*(536), 309-332.

Simons, H. (2009). *Case study research in practice*. Sage Publications.

Skreta, V., & Veldkamp, L. (2008). Ratings shopping and asset complexity: a theory of ratings inflation. *Journal of Monetary Economics, 56*(5), 678-695.

Solomon, D. (2012). The rise of a giant: securitization and the global financial crisis. *American Business Law Journal, 49*(4), 859-890.

Song, H., & Lu, Q. (2017). What kind of SMEs can benefit from supply chain finance?—based on the perspective of network and capability. *Management World,* (6), 104-121.

Stake, R. E. (2005). *Qualitative case studies, the sage handbook of qualitative research*. Sage Publications.

Stein, J. C. (2002). Information production and capital allocation: decentralized versus hierarchical firms. *The Journal of Finance, 57*(5), 1891-1921.

Stewart, H., & Gapp, R. (2014). Achieving effective sustainable management: a small-medium enterprise case study. *Corporate Social Responsibility and Environmental Management, 21*(1), 52-64.

Sun, H. K. (2019). 国外 REITs 发展的经验及对我国 REITs 转型的启示 [The experience of foreign PEITs development and its enlightenment for PEITs transformation in China]. *On Economic Problems,* (10), 56-63.

Sun, X. H. (2018). *Analysis of financing models for small and medium-sized real estate enterprises* [Master's thesis]. Tian jin university.

Tang, Z. J., Xu, H. J., Ba, S. S., Xu, H., & Ba, S. (2010). Impact of the real estate fluctuations on the China's macroeconomics. *Statistical Research, 27*(2), 15-22.

The People's Bank of China [PBOC]. (2020, December 31). *2014-2020 monetary statistics overview.* The People's Bank of China. Retrieved May 10, 2022, from http://www.pbc.gov.cn/diaochatongjisi/116219/116319/3959050/index.html

The State Council of the People's Republic of China. (2017). 2017 Government work report, CHN (Report No. GOSC 5/3/2017)

Thomas, G. (2013). *Case study methods in education*. Sage Publications.

Uzun, H., & Webb, E. (2007). Securitization and risk: empirical evidence on US banks. *The Journal of Risk Finance, 8*(1), 11-23.

Vinod, K. (2006). *Securitization: the financial instrument of the future*. John Wiley & Sons Inc.

Wang, K. G. (1999). *Theory of asset securitization*. Shanghai University of Finance and Economics Press.

Wang, X. (2021). 不动产投资信托(REITs)监管成本与制度完善—基于欧美制度比较的视角 [REITs supervision cost and Institutional perfection — from the perspective of system comparison between europe and the united states]. *Financial Regulation Research,* (2), 1-16.

Wang, X. G. (2017). The problem of real estate inventory and the countermeasures of de-inventory. *Theoretical Exploration,* (2), 16-21.

Wang, X. M. (2018). 我国住房租赁 REITs 市场发展探析 [Analysis on the development of housing leasing REITs market in China]. *New Finance,* (3), 28-32.

Wang, Y. H. (2007). The control of the lack of credit in enterprises. *Zhejiang Finance,* (10), 51-52.

Wang, Y. H. (2019). An empirical analysis of the correlation between the regulation of real

estate investment and the steady growth of GDP. *Macroeconomics,* (3), 47-58.

Wen, X. Z., Jiang, H. Y., Zhang, H. Y., Hai Yun, J., & Hai Yan, Z. (2020). Research on the trust repair tactics among three parties in the financing guarantee circle of default SMEs from the perspective of multi-party game. *Forecasting, 39*(2), 76-83.

Wojtowicz, M. (2014). CDOs and the financial crisis: credit ratings and fair premia. *Journal of Banking & Finance, 39*(2), 1-13.

Wu, S. (2013). On the necessity and realization of mortgage-backed securitization in China. *Modern Economic Information,* (5), 13-14.

Xie, Y. J. (2004). *Special purpose institution of asset securitization* [Master thesis]. China University of Political Science and Law.

Xing, L. C., & Liang, Y. X. (2013). The predicament and way out of the financing difficulties of small and medium-sized Enterprises. *Journal of University of Jinan(Social Science Edition), 23*(2), 1-7.

Xu, L., Tang, Q. L., & Qing Lan, T. (2019). 我国科技型中小企业无形资产组合证券化研究 [Research on portfolio securitizations of intangible assets of high-technology SMEs in China]. *Jinan Finance,* (4), 22-29.

Xu, W. G., & Liu, Y. (2017). Research on potential liquidity risk and supervision of bank credit asset securitization. *Financial Regulation Research,* (11), 83-93.

Xu, X. Q. E., & Chen, T. (2012). The effect of monetary policy on real estate price growth in China. *Pacific-Basin Finance Journal, 20*(1), 62-77.

Xu, Y. J., & Cao, C. (2016). Enlightenment from the development of american CMBS market. *China Finance,* (22), 74-75.

Yan, L. M. (2017). Discussion on asset securitization financing methods of real estate enterprises. *Communication of Finance and Accounting,* (35), 26-30.

Yang, W. W. (2003). Research on the index of house price to income ratio. *Statistical Research, 20*(1), 47-49.

Yao, L. (2001). *Asset securitization-basic theory and case study*. Shanghai University of Finance and Economics Press.

Yin, R. K. (2010). *Case study research design and methods*. Chongqing University Press.

Zang, H. (2014). *An empirical study on corporate governance and corporate credit* [Master thesis]. Anhui University of Technology.

Zhang, B. L., & Pan, H. X. (2013). Shadow banking and real estate bubble: the source of systemic financial risk. *Modern Finance and Economics (Journal of Tianjin University of Finance and Economics),* (11), 33-44.

Zhang, D., Yang, C. J., Shao, R., Chao-jun, Y., & Rui, S. (2014). Some suggestions on promoting the development of asset securitization. *Journal of Lanzhou University (Social Science Edition), 42*(3), 111-115.

Zhang, J. P., & Xu, Y. M. (2021). Industry background, credit rating and financing cost of asset securitization. *Journal of Industrial Technological Economics, 40*(03), 47-53.

Zhang, L., & Lai, Y. J. (2015). Feasibility Analysis of Credit Asset Securitization for Small and Medium-sized Enterprises. *New Economy,* (Z2), 30-31.

Zhang, S. S., Wu, Y. H., & Yi Hui, W. (2018). Research on the motivation of enterprise asset securitization in my country——empirical analysis based on logit model. *Journal of Henan Institute of Education (Natural Science Edition), 27*(1), 40-47.

Zhang, S. Y. (2013). 不动产抵押权证券化与中小企业融资平台构建 [Real estate mortgage securitization and the construction of financing platform for small and medium-sized enterprises]. *Hunan Social Sciences,* (1), 176-179.

Zhang, X. D., & Han, A. H. (2002). Analysis of the securitixation of mortgage loans. *Finance & Trade Economics,* (12), 45-49.

Zhao, Y. Q. (2015). The european experience of small and medium enterprises securitization

and its implications. *Contemporary Economy & Management, 37*(11), 77-82.

Zheng, S., Han, G. F., & Shi, G. (2016). The impact of real estate purchase restrictions on corporate default risk. *The Journal of World Economy, 39*(10), 150-173.

Zheng, Y., Mengjie, H., & Min, Y. (2013). Research on the mechanism of social network improving the loan availability of small and micro enterprises. *Management World,* (4), 135-149.

Zhou, H., & Pan, Q. (2010). Comparison of current status of management and implementation of liquidity risk stress testing. *Studies of International Finance | Stud Inter Fin,* (4), 74-78.

Zhou, K., & Yuan, Y. (2014). Research on the application of stress test on dynamic liquidity risk of commercial banks. *Audit & Economy Research, 29*(3), 104-112.

Zhu, M. (2019). Supply chain finance factoring for real estate enterprises: model, structure and risk management. *Shanghai Finance,* (6), 78-83.

Zhu, W. X. (2000). Asset Securitization and the Value-Added Investment of Insurance Funds——Also on the Construction of Effective Micro Credit Foundation and Investment-Grade Financial Instruments in my country's Capital Market. *Economic Research,* (9), 62-66.

Zweig, P. L. (1989). *The asset securitization handbook*. McGraw Hill Professional Publishing.
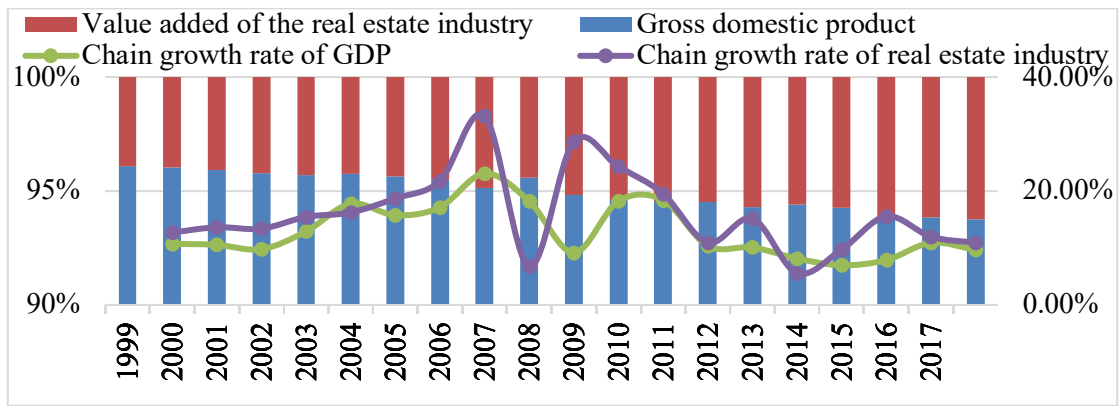
Annexes
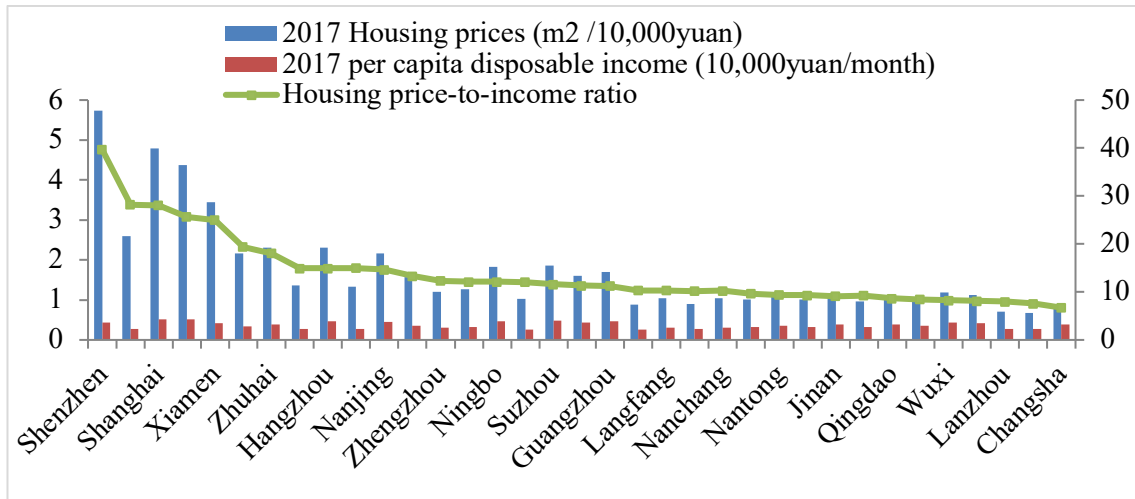
Annexes 1.1 Housing price-to-income ratio of 35 large and medium-sized cities（2017）

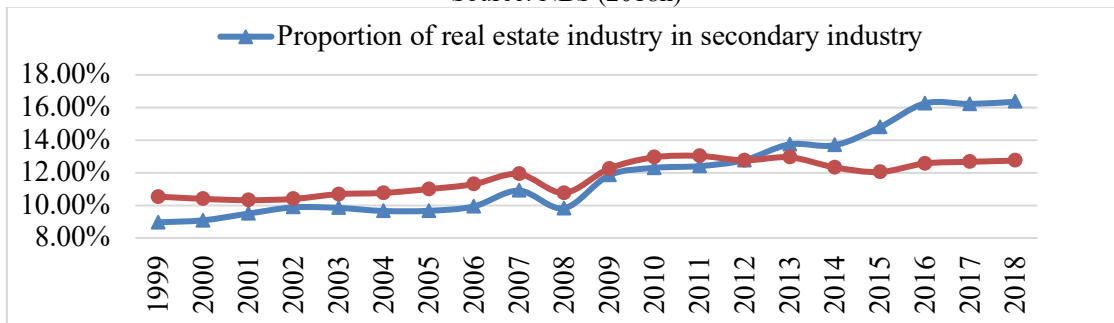Source: National Bureau of Statistics [NBS] (2017)
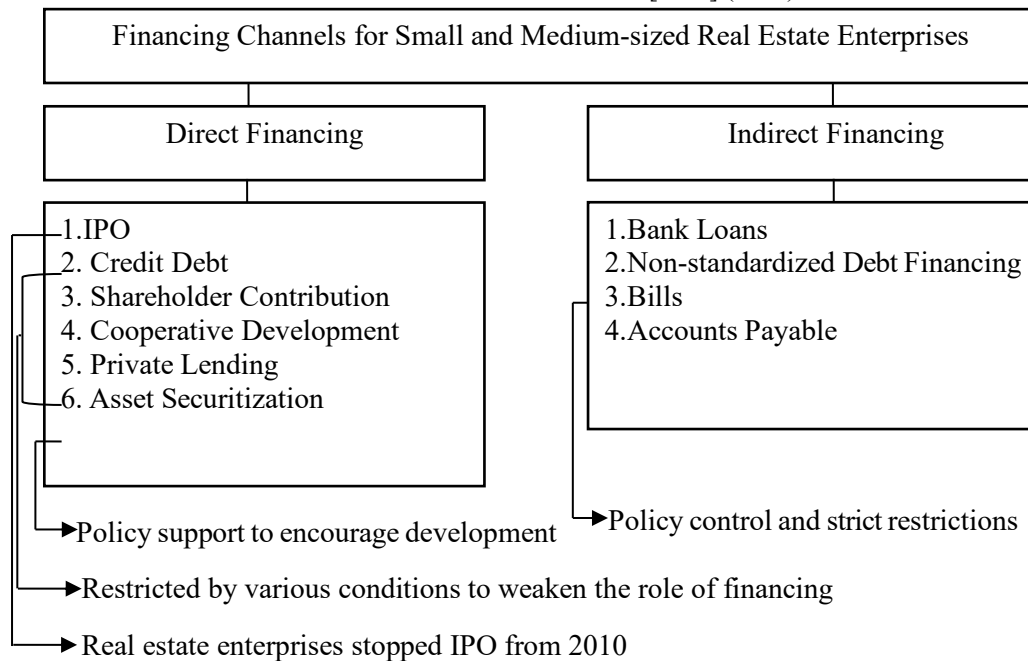
Annexes 1.2 Diagram of Financing Channels for Small and Medium-sized Real Estate Enterprises in China
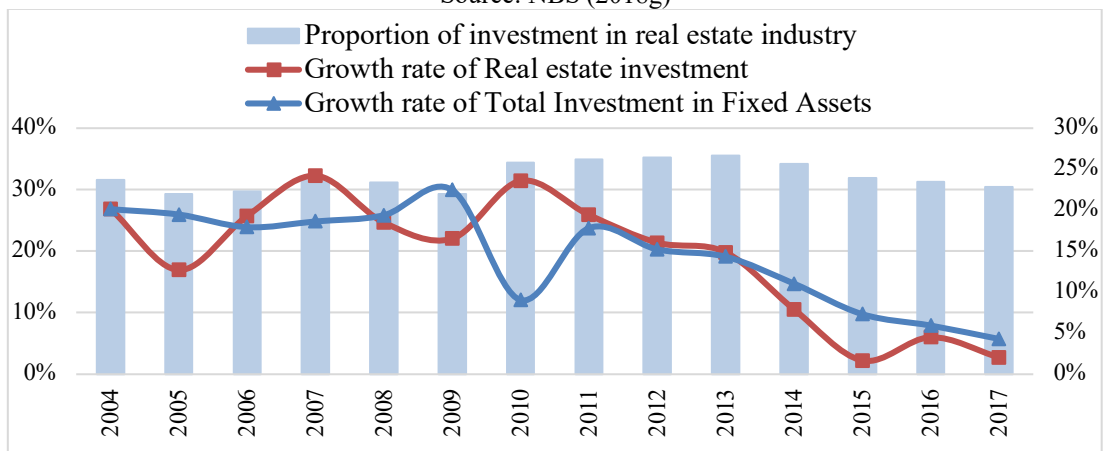
Source: Author finishing

Annexes 4.1 Chart of comparison between real estate added value and GDP
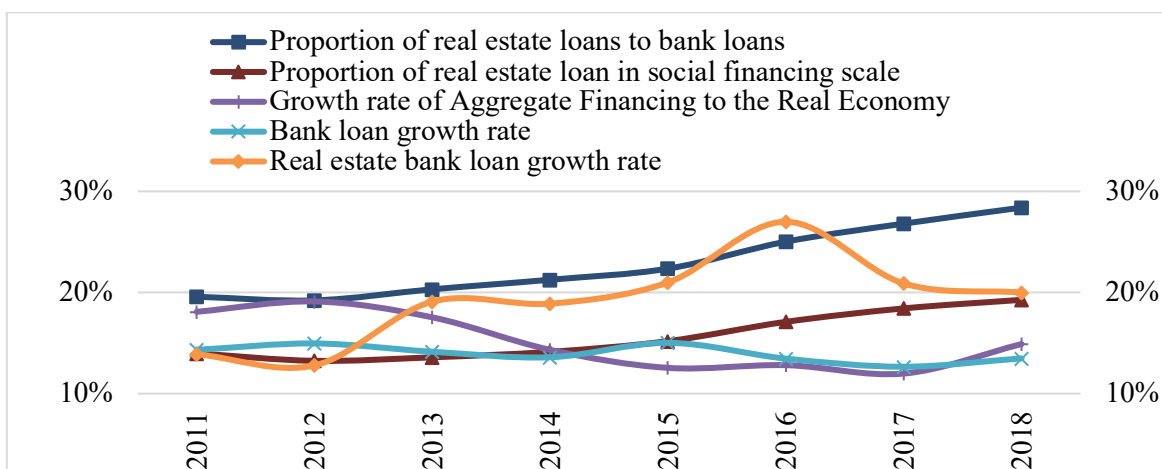
Source: NBS (2018h)

Annexes 4.2 Proportion of real estate added value in secondary and tertiary industries
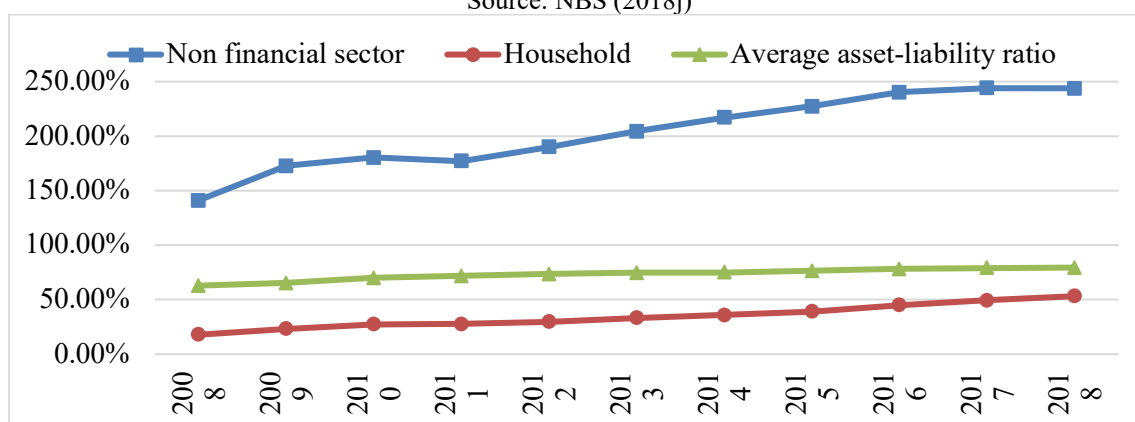
Source: NBS (2018g)

Annexes 4.3 Chart of growth rate trend of real estate investment and social fixed assets investment
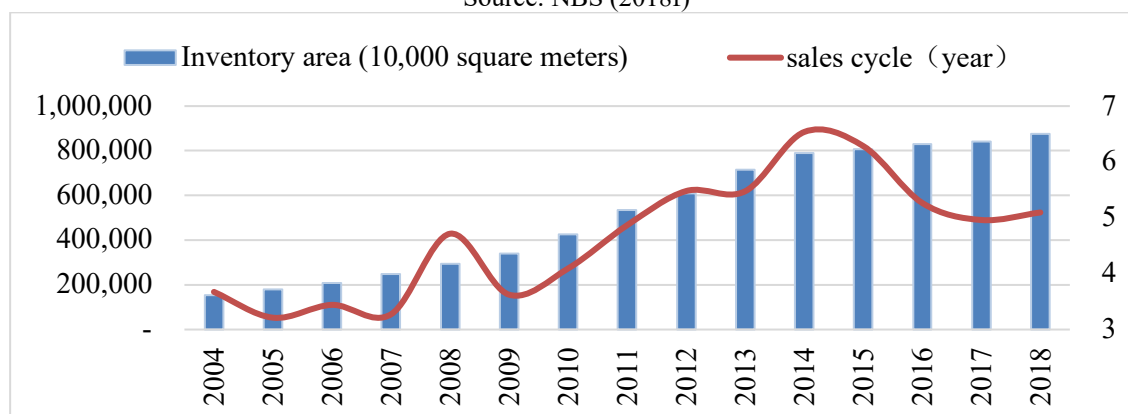
Source: NBS (2017)

Annexes 4.4 Chart of proportion and growth rate trend of real estate loans

Source: NBS (2018j)

Annexes 4.5 Leverage ratio trend chart

Source: NBS (2018f)

Annexes 4.6 Real estate inventory area and sales cycle

Source: NBS (2018e)

Annexes 4.7 Rapidly develop direct financing meeting and policy document table

No.	Date	Responsible Department/Meeting	Policy Document/Meeting Content
1	April 20, 2014	State Department	Several Opinions of the General Office of the State Council on Financial Services for the Development of "Agriculture, Rural areas and Farmers"

| 2	April 24, 2014	People's Bank of China, China Banking and Insurance Regulatory Commission	Notice on Regulating Interbank Business of Financial Institutions
3	May 8, 2014	State Department	Several Opinions of the State Council on Further Encouraging and Guiding the Healthy Development of the Capital Market
4	August 14, 2014	State Department	Guiding Opinions on Multiple Measures and Efforts to Alleviate the High Cost of Enterprises' Financing
5	December 23, 2015	State Department	Implementation Opinions on Further Significantly Increasing the Proportion of Direct Financing and Optimizing the Financial Structure
6	February 14, 2016	People's Bank of China	Measures for the Administration of Over-the-Counter Businesses in the National Interbank Bond Market
7	July 18, 2016	State Department	Opinions of the Central Committee of the Communist Party of China and the State Council on Deepening the Reform of the Investment and Financing System
8	August 8, 2016	State Department	The 13th Five-Year Plan for National Science and Technology Innovation
9	August 8, 2016	State Department	Work Plan for Reducing the Cost of Real Economy Enterprises
10	July 14, 2017	National Financial Work Conference	Raise the development direct financing to an unprecedented height and propose to put the development direct financing in an important position.
11	November 27, 2017	State Department	Guiding Opinions on Deepening "Internet + Advanced Manufacturing" to Develop Industrial Internet
12	October 18, 2017	The 19th National Congress of the Communist Party of China	Deepen the reform of the financial system, enhance the ability of financial services to serve the real economy, increase the proportion of direct financing
13	September 26, 2018	State Department	Notice on Supporting Direct Financing of High-quality Enterprises to Further Enhance the Ability of Enterprise Bonds to Serve the Real Economy
14	December 5, 2018	National Development and Reform Commission	Several Opinions on Strengthening Financial Services for Private Enterprises
15	February 14, 2019	State Department	Guiding Opinions on Promoting the Healthy Development of SMEs
16	April 7, 2019	State Department	Notice on Supporting Direct Financing of High-quality Enterprises to Further Enhance the Ability of Enterprise Bonds to Serve the Real Economy
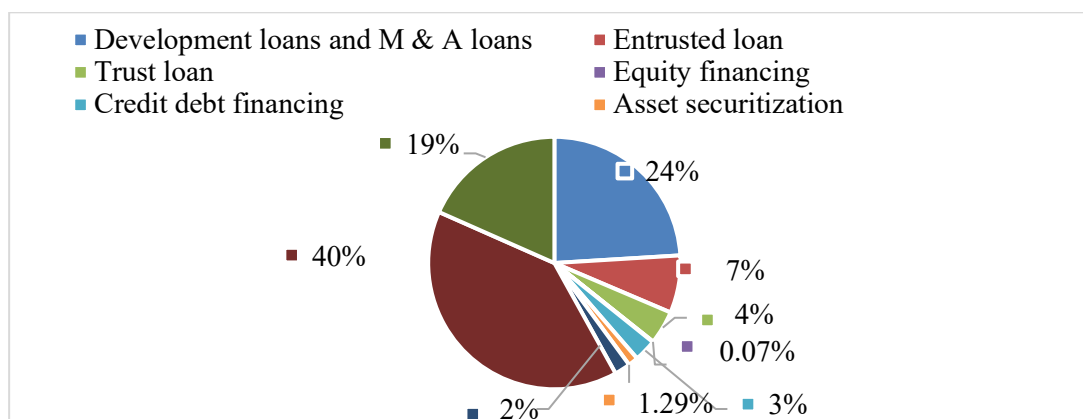
Annexes 4.8 Balance of interest-bearing debts served as the main financing channels of real estate enterprises in 2018

Source: NBS (2018i)
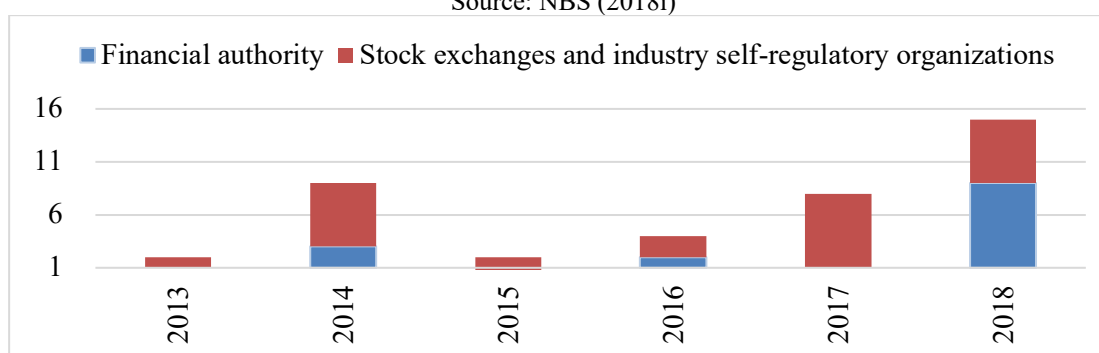
Annexes 4.9 Chart of asset securitization policies issued from 2013 to 2018

Source: Author finishing
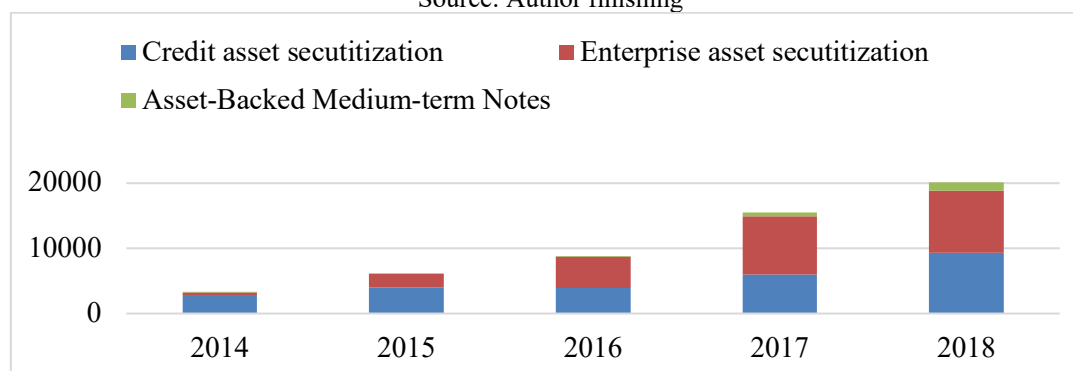
Annexes 4.10 Issuance scale of asset securitization products in each market from 2013 to 2018
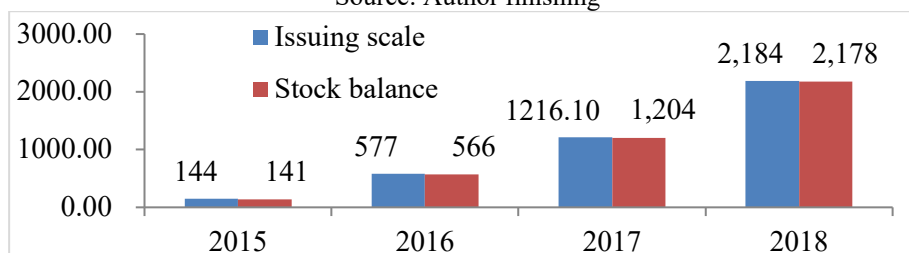
Source: CSRC (2018, December 31)

Annexes 4.11 China asset securitization issuance and stock statistics (Unit: Order/billion)

Product Type	Issued Number	Issued Amount	Stock Number	Stock Amount
All	**1028**	**14,197.51**	**4327**	**54,944.51**
Credit Asset Securitization	**94**	**4,270.56**	**542**	**16,115.06**
Business Loan	3	101.99	28	251.05
Personal Auto Loan	23	1,215.31	81	1,962.45
Home Mortgage Loan	34	2,642.92	254	12,711.36
Non-performing Assets Restructuring	24	90.28	134	259.23

|				
Personal Consumption Loan	8	171.08	18	425.36
Other	2	48.98	27	505.61
Enterprise Asset Securitization	**698**	**7,360.39**	**2939**	**29,403.62**
Small Loan	10	31	45	116.36
Small and Micro Loan	63	592.9	101	747.9
Financial Leasing	85	918.95	484	3,142.09
Accounts Receivable	29	373.21	205	2,506.94
Trust Beneficiary Rights	12	174.77	50	783.04
CMBS/CMBN	37	570.43	182	3,667.19
Personal Consumption Finance	71	656.68	401	4,512.72
Supply Chain	267	1,624.91	696	4,044.74
Remaining mortgage	34	322.34	160	1,612.57
Right to Benefit from Infrastructure Charge	22	383.19	182	1,483.99
Affordable Housing	22	201.8	75	618.63
Other	46	1510.2	358	6167.46
Asset Backed Notes	**236**	**2,566.57**	**846**	**9,425.84**
Small and Micro Loan	44	608.4	94	1,198.40
Financial Leasing	36	396.33	170	1,479.33
Bill Asset	11	109.03	27	322.12
Supply Chain	70	374.56	174	1,007.75
Other	75	1078.24	169	1952.48

Source: Author finishing

Annexes 4.12 Issuance scale of China's real estate asset securitization over the years (CNY 100 million)

Source: CSRC (2018, December 31)
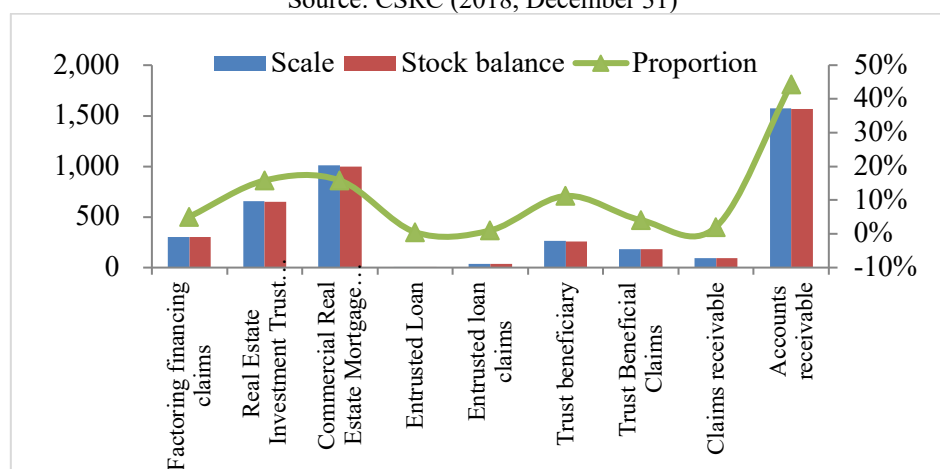
Annexes 4.13 Issuance scale and proportion of asset securitization products of real estate enterprises

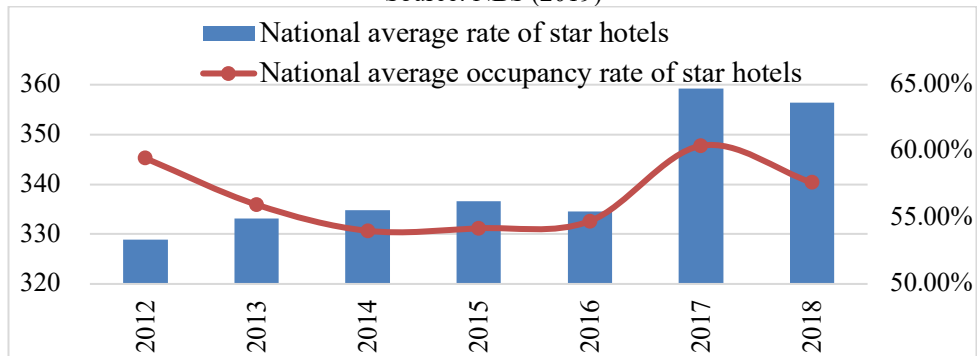Source: China Securities Regulatory Commission [CSRC] (2018)
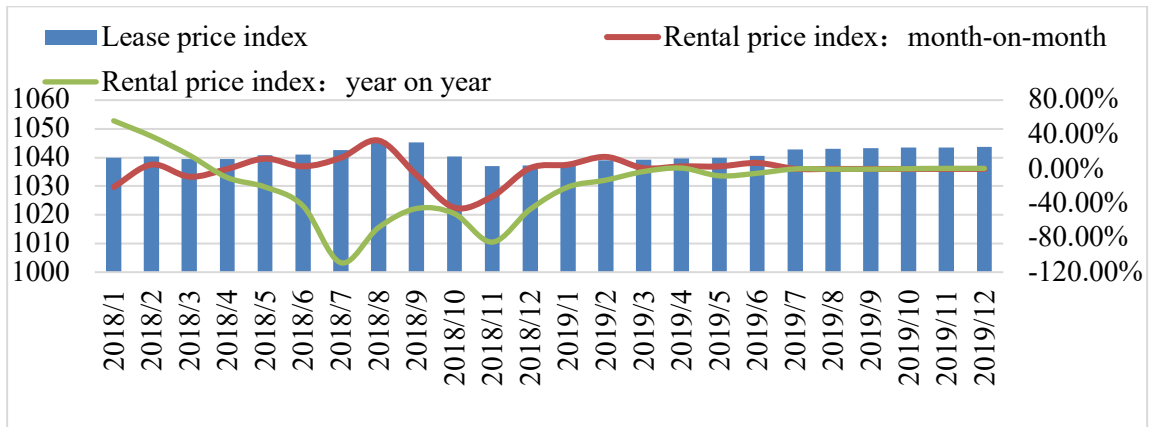
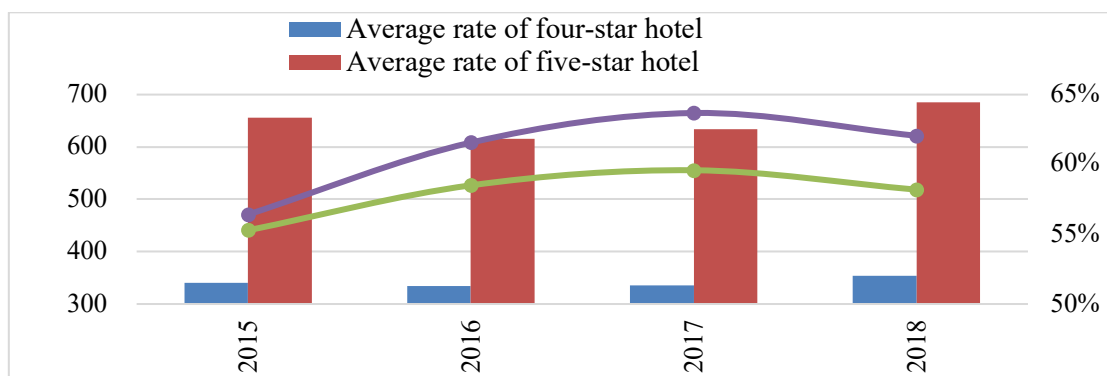Annexes 4.14 Trend of China's urban rental price index

Source: NBS (2018c)
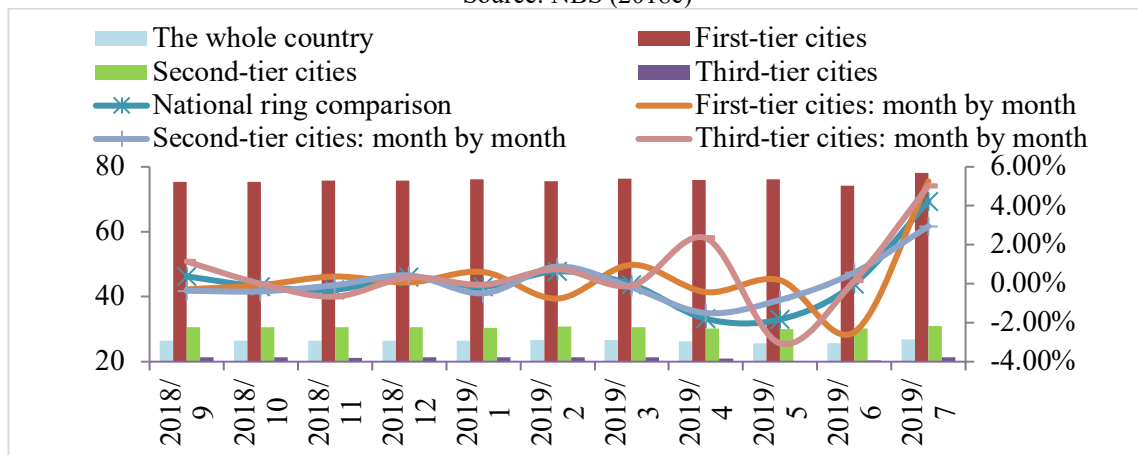
Annexes 4.15 Trend chart of urban graded rental price index
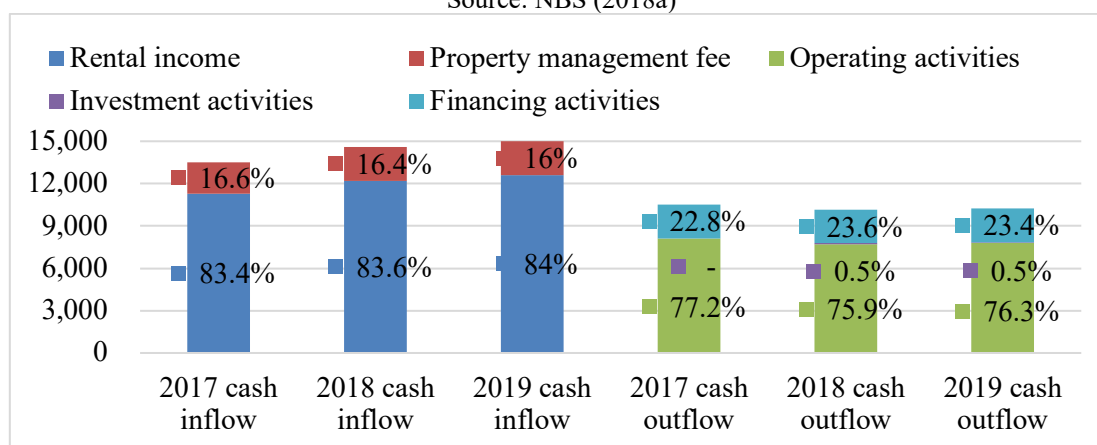
Source: NBS (2019)

Annexes 4.16 Trend of average room rate and occupancy rate of star-related hotels in China

Source: NBS (2018d)

Annexes 4.17 Trend of average room rate and occupancy rate of four-star and five-star hotels in China

Source: NBS (2018a)

Annexes 5.1 2017 - 2019 Cash flow structure chart of shopping mall

Annexes 5.2 2017 - 2019 Comparison table of cash flow indicators of shopping malls

Indicator	2017	2018	2019
Year-on-year growth rate of cash inflows		7.9%	2.8%
Year-on-year growth rate of cash outflow		3.4%	-0.7%
Cash inflow / Cash outflow ratio	128.4%	143.4%	146.4%
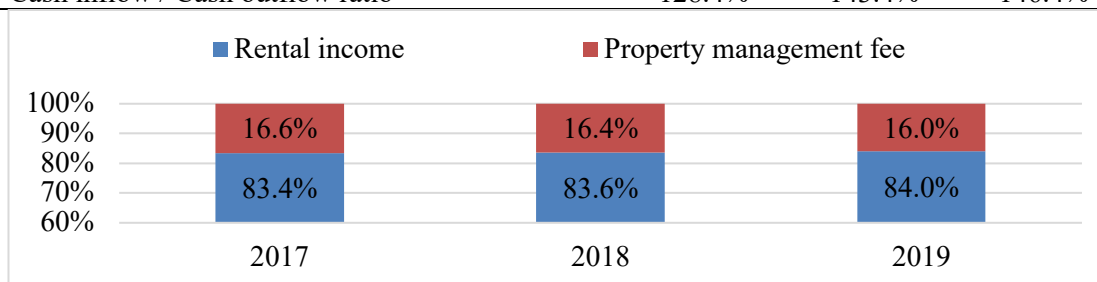
Annexes 5.3 2017 - 2019 The structure chart of cash inflow from operating activities in the Shopping

mall

Annexes 5.4 2019 Comparison of accounts receivable and cash flow in shopping mall

Subject	accounts receivable	Q1 Cash inflow	Q2 Cash inflow	Q3 Cash inflow	Q4 Cash inflow	Cumulative collection rate
accounts receivable		2,904	2,923	3,076	3,051	
Q1 Cash inflow	2,904	2,752	711	0	0	119%
Q2 Cash inflow	2,923	157	1,959	161	1	99%
Q3 Cash inflow	3,076	45	661	2,386	273	102%

Q4 Cash inflow	3,051	31	153	484	2,604	104%
quarterly collection rate		95%	91%	83%	94%	

Annexes 5.5 2018 Distribution of lease term of shopping mall (Unit: households, square meters)

| contract period	households	Proportion	Area	Proportion
>1	7	8%	4,297	19%
1≥2	18	21%	544	2%
2≥3	59	69%	14,881	65%
3≥5	2	2%	3,030	13%
Total	86	100%	22,751	100%

Annexes 5.6 Distribution table of lease type term of shopping mall (Unit: square meter, thousand yuan)

Types	Index	≥1 年	1≥2 年	2≥3 年	4≥5 年	≤5
Long rent	Area				11,077	8,991
	Rent				350.79	490.74
Renew the lease	Area	140	101	191	106	
	Rent	13.35	8.13	17.32	5.17	
New rent	Area	39	672	1,026	83	
	Rent	2.78	60.76	67.55	3.49	

Annexes 5.7 2017 - 2019 The structure chart of cash outflow from operating activities of shopping mall

Subject	2017	2018	2019
Cash paid for commodities or labor	29%	29%	27%
Cash paid to and for employees	7%	7%	8%
Taxes and fees paid	24%	26%	37%
Other cash paid related to operating activities	44%	36%	29%
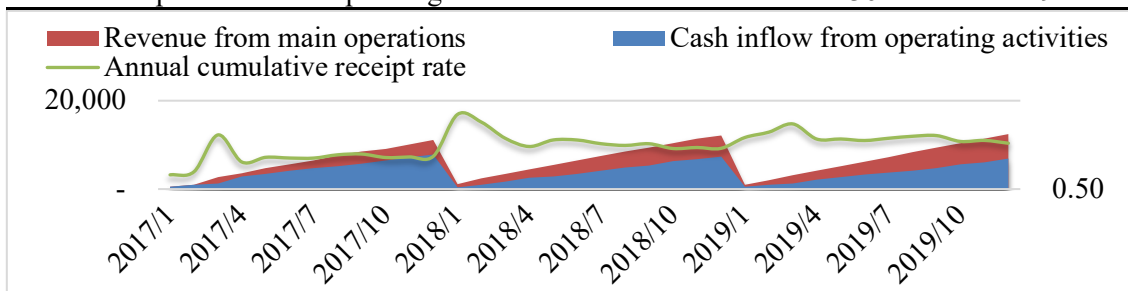
Annexes 5.8 2017 - 2019 The trend of cash flow from operating activities in shopping mall
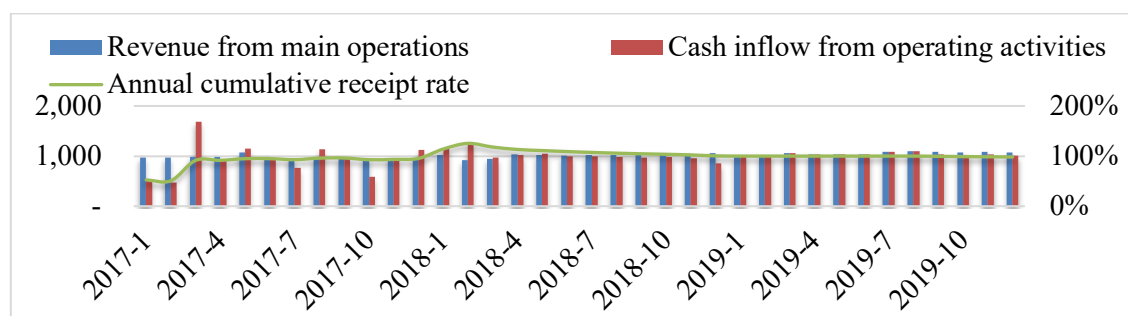
Annexes 5.9 2017 - 2019 Comparison of the trend of revenue and cash inflow from operating

activities in the Shopping mall（Unit: ten thousand yuan,%）
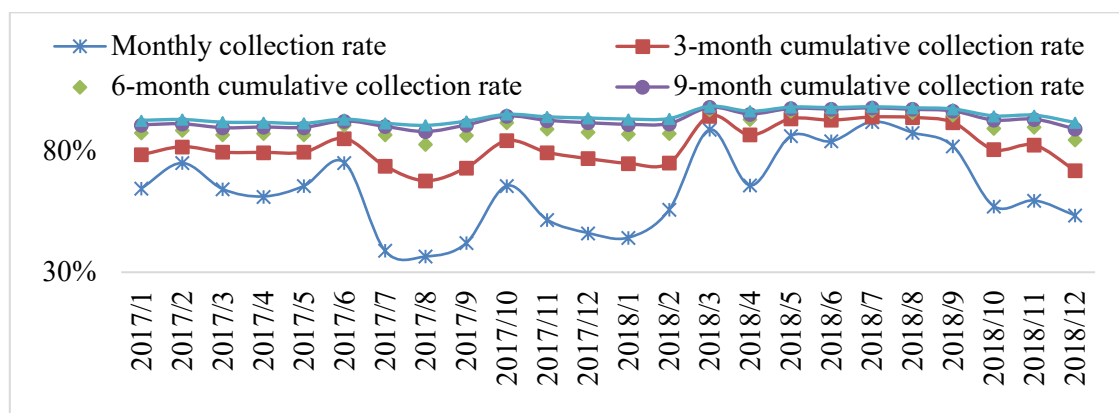
Annexes 5.10 Trends of rental collection rates in different periods of shopping mall

Annexes 5.11 Comparison of main business income and cash flow in 2019

|	2019/1	2019/2	2019/3	2019/4	2019/5	2019/6	2019/7	2019/8	2019/9	2019/10	2019/11	2019/12	合计	receivable recovery rate
operating revenue	951	957	996	970	980	972	1,018	1,033	1,025	1,011	1,028	1,012	11,954	
operating cash inflow	951	957	995	970	980	972	1,018	1,032	981	958	973	948	11,736	
2019/1	877	312	7	7	0	0	0	0	0	0	0	0	1,204	127%
2019/2	66	528	241	3	0	0	0	0	0	0	0	0	838	107%
2019/3	5	65	569	139	0	0	0	0	0	0	0	0	778	97%
2019/4	0	25	56	408	152	1	0	0	0	0	0	0	642	89%
2019/5	3	2	15	263	432	149	0	0	0	0	0	0	863	89%
2019/6	0	0	57	87	97	371	160	1	0	0	0	0	773	87%
2019/7	0	0	45	1	215	129	364	219	0	0	0	0	973	89%
2019/8	0	0	0	2	38	274	441	664	148	0	0	0	1,569	97%
2019/9	0	0	0	0	0	1	6	94	449	272	0	0	823	95%
2019/10	0	25	0	44	45	44	0	10	378	628	287	0	1,462	100%
2019/11	0	0	5	15	0	1	45	45	3	56	597	472	1,239	102%
2019/12	0	1	0	2	0	1	2	0	1	1	88	475	572	98%
receivable recovery rate	92%	88%	82%	57%	60%	54%	51%	86%	58%	89%	86%	94%		
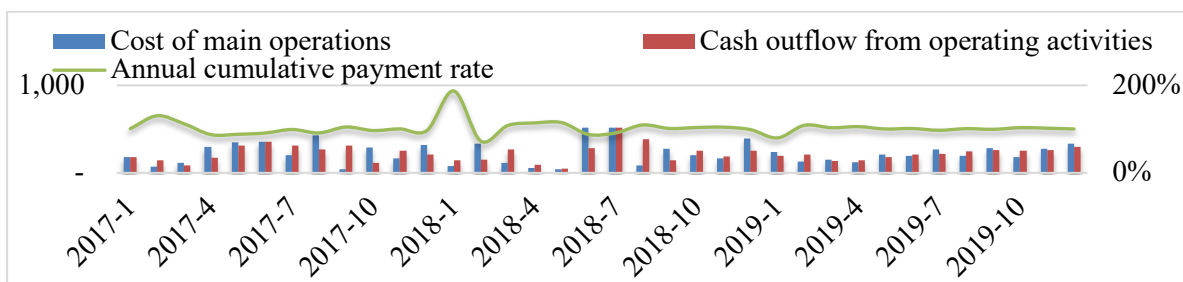
Annexes 5.12 2017 - 2019 Comparison of the trend of cost of sales and cash outflows from operating activities in the shopping mall（Unit: ten thousand yuan,%）

Annexes 5.13 2017 - 2019 Cash flow structure chart of hotel

Subject	Cash inflow			Cash outflow		
	2017	2018	2019	2017	2018	2019
Rooms Revenue	9,420.31	12,827.11	13,044.70			
F&B Revenue	5,697.12	5,855.39	6,226.93			
Operating activities				13,858.29	16,778.27	17,045.92
Investment activities				.	90.00	89.00
Financing activities				2,400.00	2,400.00	2,400.00

Annexes 5.14 2017 - 2019 Comparison table of cash flow indicators of hotel

Indicator	2017	2018	2019
Year-on-year growth rate of cash inflow		23.6%	3.2%
Year-on-year growth rate of cash outflow		18.5%	1.4%

Cash inflow / Cash outflow ratio		93.0%	97.0%	98.7%

Annexes 5.15 2017 to 2019 Operating cash flow structure chart of the hotel

Indicator	2017	2018	2019
cash inflow	15,117.43	18,682.50	19,271.63
cash outflow	13,858.29	16,778.27	17,045.92
net cash flow	1,259.14	1,904.24	2,225.71

Annexes 5.16 Structural statement of cash inflows from hotel operating activities from 2017 to 2019

Income type	2017	2018	2019
Guest Room	62.3%	68.7%	67.7%
Catering	37.7%	31.3%	32.3%

Annexes 5.17 Comparative Table of income composition of hotel tourists from 2018 to 2019

Tourist source	2018	2019	Proportion of increase or decrease
Business	58.30%	55.70%	2.6%
Meeting	16.40%	17.60%	+1.2%
Travel	8.10%	6.20%	-1.9%
Other	17.20%	20.50%	+3.3%

Annexes 5.18 2017-2019 structural statement of cash outflow from hotel operating activities

Subject	2017	2018	2019
Cash paid for commodities or labor	20%	29%	30%
Cash paid to and for employees	23%	20%	20%
Taxes and fees paid	13%	14%	15%
Other cash paid related to operating activities	44%	37%	36%
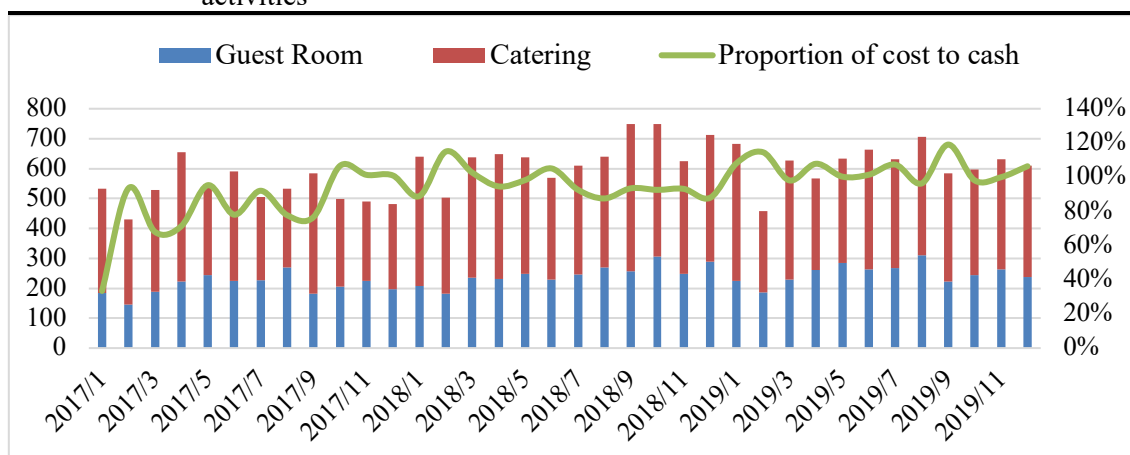
Annexes 5.19 2017 - 2019 Proportion of hotel cost paid in cash
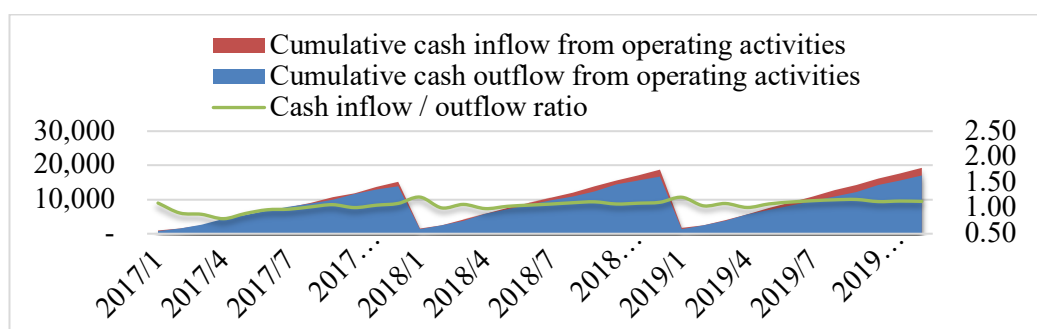
Annexes 5.20 2017 - 2019 The Trend of cash flow from operating activities of hotel

151
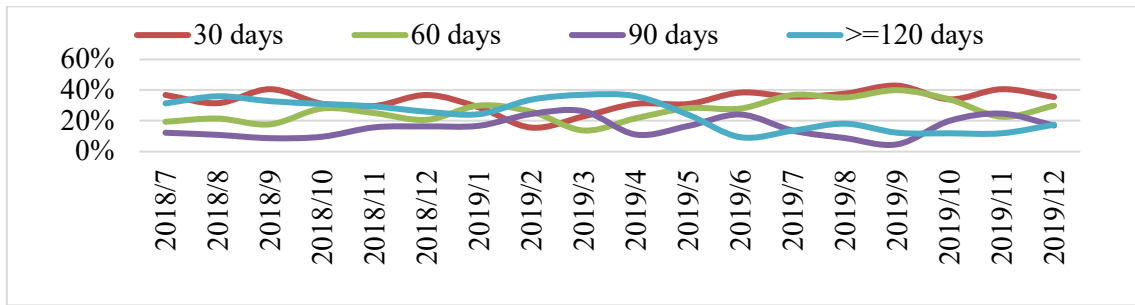
Annexes 5.21 2017 - 2019 proportion of hotel cash payment in different periods
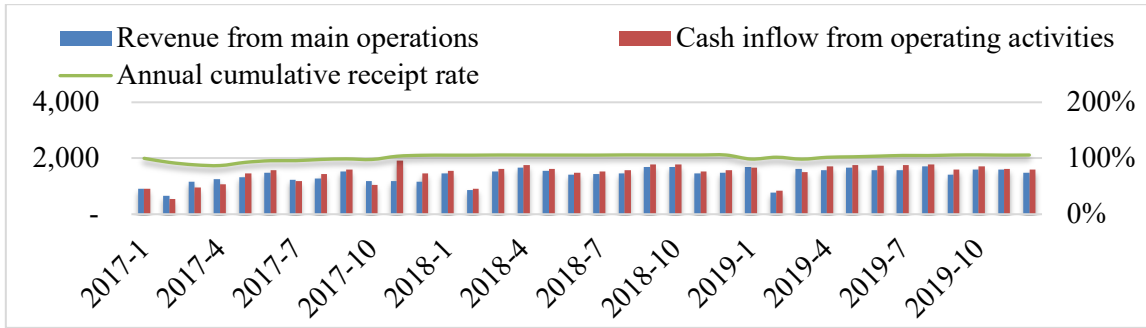
Annexes 5.22 2017 - 2019 Comparison of the trend of revenue and cash Inflow from operating

activities of hotel (Unit: ten thousand yuan, %)
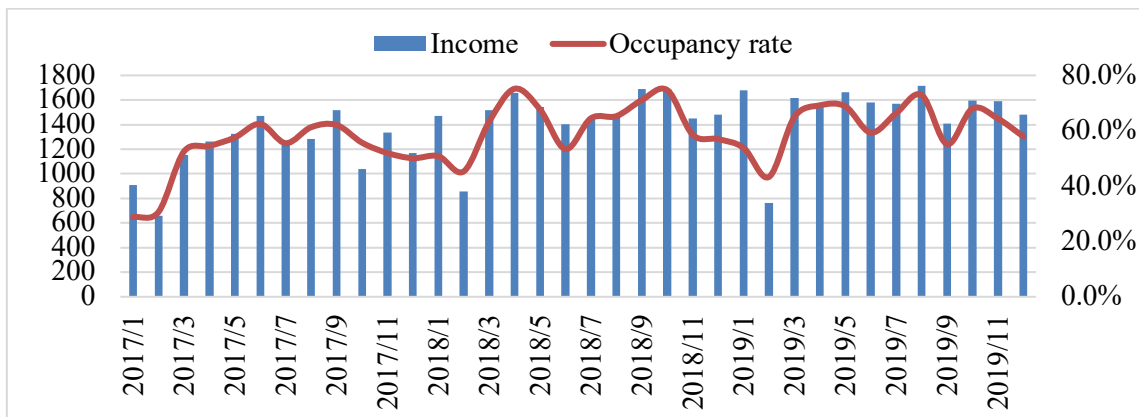
Annexes 5.23 2017 - 2019 Hotel occupancy rate and revenue trend chart

Annexes 5.24 Trend comparison between ADR and RevPAR in 2017 - 2019 Hotels

Annexes 5.25 2017 - 2019 Comparison of the trend of cost of sales and cash outflows from operating activities of hotel (unit: ten thousand yuan, %)

Annexes 5.26 2017 - 2019 Cash flow structure chart of residential assets

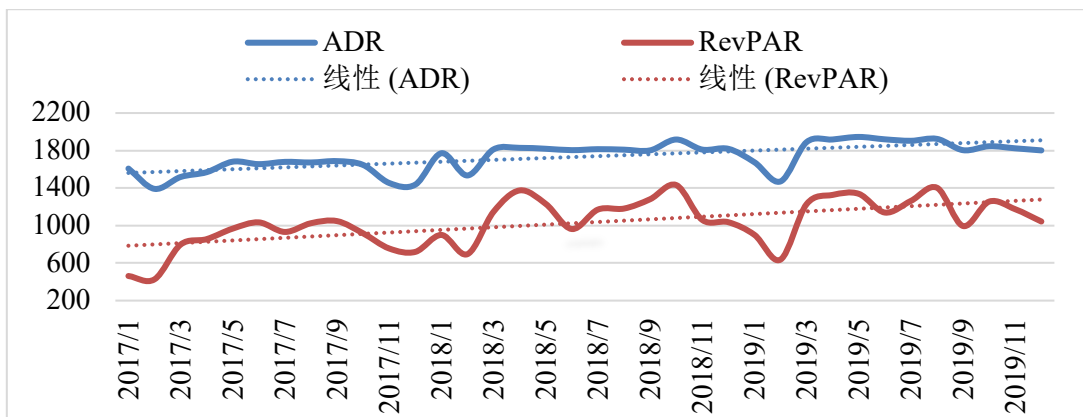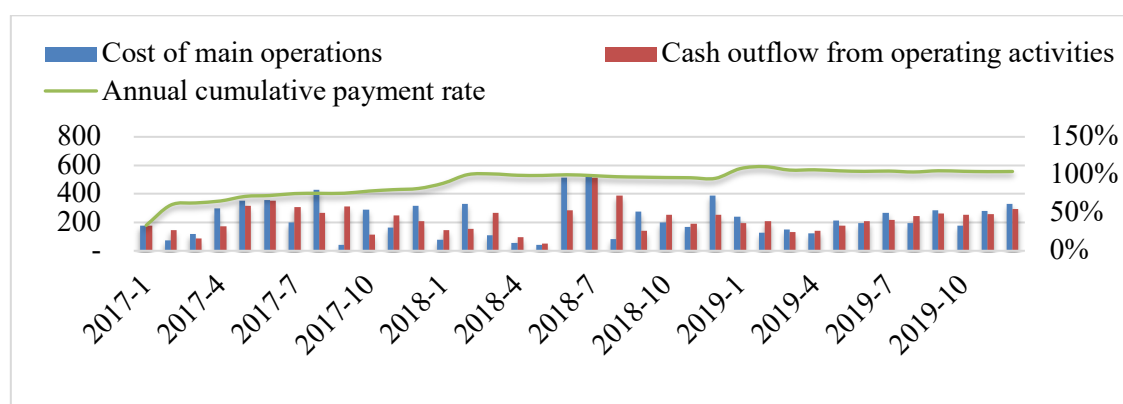| Indicator	Cash inflow			Cash out flow		
	2017	2018	2019	2017	2018	2019
Residential sales	12,000	15,960	19,920			
Interest income	4,800	4,800	4,800			
Operating activities				8,342.27	9,074.12	7,971.44
Investment activities						39.00
Financing activities				10,976.00	24,947.00	23,918.00

Annexes 5.27 2017 - 2019 Comparison table of cash flow indicators of residential

Indicator	2017	2018	2019
Year-on-year growth rate of cash inflows		23.6%	19.1%
Year-on-year growth rate of cash outflow		76.1%	-6.2%
Cash inflow / Cash outflow ratio	87.0%	61.0%	77.4%

Annexes 5.28 2017 - 2019 Comparative table of rent share and increase rate of various types of Customers in shopping mall

Customer type	2017		2018		2019	
	Proportion	Growth rate	Proportion	Growth rate	Proportion	Growth rate
Long-term lease	84.5%	1.6%	83.6%	0.0%	82.6%	6.4%
Lease renewal	3.9%	7.5%	4.1%	5.5%	4.3%	12.9%
Newly signed lease	11.5%	6.1%	12.2%	7.3%	13.1%	15.0%
Accumulative total	100.0%	2.3%	100.0%	1.1%	100.0%	7.7%

Annexes 5.29 Rent interval table of the best location on the first floor of the main business district in beijing in the first quarter of 2019

Business circle	RMB / SM / Month	Euro per /SF /Month	Dollars //SF /Month	Future trend
San Litun	1,500-2,800	18.3-34.1	20.8-38.8	↑
Zhong Guancun	1,300-1,800	15.8-21.9	18-24.9	—
Xi Dan	1,000-2,500	12.2-30.4	13.8-34.6	—
Central Business District.	800-3,500	9.7-42.6	11.1-48.4	↑
Wang Fujing	800-3,200	9.7-38.9	11.1-44.3	—

Source: Cushman & Wakefield (2019)
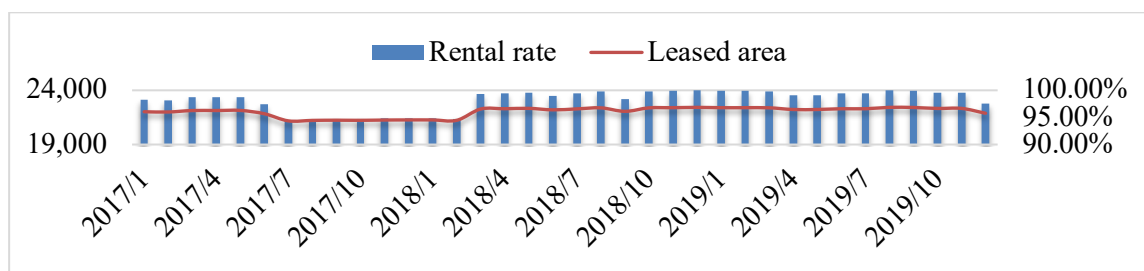
Annexes 5.30 2017 - 2019 Trend chart of leased area and rental rate
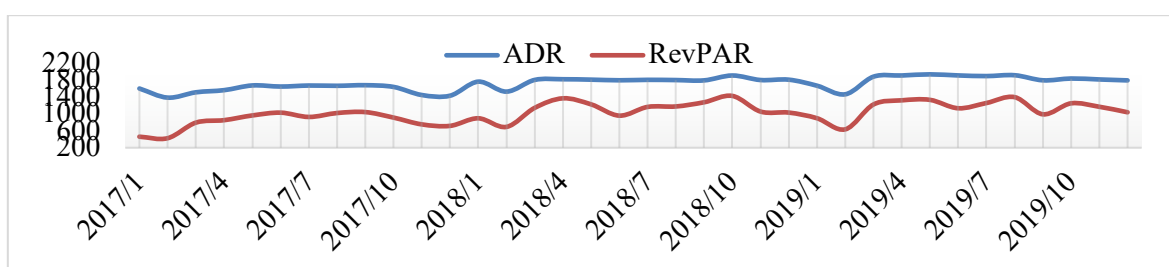
Annexes 5.31 2017 - 2019 Trend comparison of ADR and RevPAR in hotels
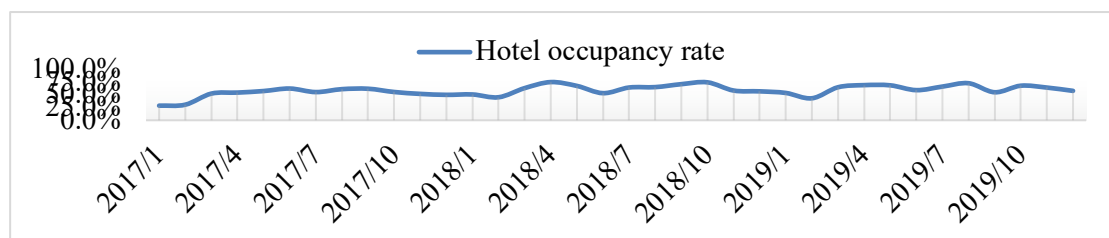
Annexes 5.32 2017 – 2019 Hotel occupancy rate

Annexes 5.33 2020 - 2024 Forecast adjustment ratio of key influencing factors

Serial number	Economic indicators	Unit	2019 Prediction basis	Forecast growth rate				
				2020	2021	2022	2023	2024
1	Rental income and Property management fee	Yuan/square meter	532	7.5%	7.5%	7.5%	3%	3%
2	Rental rate	%	97.6%	0.23%	0.23%	0.23%	0.15%	0.15%

Annexes 5.34 2020 Forecast of revenue

Serial number	Economic indicators	Unit	2020Forecast amount
1	**The Shopping mall**	Ten thousand yuan	**15,040**
1.1	Rental income	Ten thousand yuan	12,484
1.2	Property management fee	Ten thousand yuan	2,557

Annexes 5.35 2020 Hold a fixed proportion of subject forecast value with the revenue（Unit：Ten thousand yuan）

Serial number	Accounting subjects	Calculation basis	2020 predicted value
1	Cost of Sales	Revenue	4,892
2	Selling & Distribution expense	Revenue	840
3	G&A expense	Revenue	1,718

4	Building Taxes	Revenue	1,263
5	Account receivable	Revenue	622
6	Accounts payable	Cost of sales	41
7	VAT- output tax	Revenue	2,080
8	VAT- input tax	Cost of sales	109
9	urban maintenance and construction tax	VAT (Output tax- Input tax)	138
10	Educational Surtax	VAT (Output tax- Input tax)	59
11	Local educational Surtax	VAT (Output tax- Input tax)	39
12	Flood prevention charges	VAT (Output tax- Input tax)	20

Annexes 5.36 Forecast statement of cash flow statement of shopping mall in 2020 (unit: ten thousand yuan)

Accounting subject	Forecast amount
Cash inflow from operating activities	
Net profit	4,665
+ Accumulated Depreciation	+2,149
- Account receivable	34
+ Accounts payable	-79
+ Taxes payable	+15
Total cash inflow from operating activities	+6,716
Cash Flow from Investing Activities	+0
Cash Flow from Financing Activities	+0
Net Increase (Decrease) in Cash and Cash Equivalents	**6,716**

Annexes 5.37 Forecast adjustment ratio of subjects related to revenue

Serial number	Economic indicators	Unit	2019 Prediction basis	Forecast growth rate				
				2020	2021	2022	2023	2024
1	ADR and F&B revenue	Yuan	1,842	3.5%	3.5%	3.5%	2%	2%
2	Hotel occupancy rate	%	62%	2.5%	2.5%	2.5%	1%	1%

Annexes 5.38 2020 Forecast of revenue

Serial number	Economic indicators	Unit	2020Forecast amount
1	**The Hotel**	Ten thousand yuan	**19,624**
1.1	Rooms Revenue	Ten thousand yuan	13,283
1.2	F&B Revenue	Ten thousand yuan	6,341

Annexes 5.39 2020 Hold a fixed proportion of subject forecast value with the revenue（Unit：Ten thousand yuan）

Serial number	Accounting subjects	Calculation basis	2020Forecast amount
1	Cost of Sales	Revenue	11,589
2	Selling & Distribution expense	Revenue	1,801
3	G&A expense	Revenue	5,748
4	Building Taxes	Revenue	1,648
5	Account receivable	Revenue	196
6	Accounts payable	Cost of sales	749

7	VAT- output tax	Revenue	1,177
8	VAT- input tax	Cost of sales	442
9	urban maintenance and construction tax	VAT (Output tax-Input tax)	51
10	Educational Surtax	VAT (Output tax-Input tax)	22
11	Local educational Surtax	VAT (Output tax-Input tax)	15
12	Flood prevention charges	VAT (Output tax-Input tax)	7

Annexes 5.40 Forecast statement of cash flow statement of hotel in 2020 (Unit: Ten thousand yuan)

Accounting subject	Forecast amount
cash inflow from operating activities	
Net profit	-1,277
+ Accumulated Depreciation	+3,787
- Account receivable	7
+ Accounts payable	-429
+ Taxes payable	+9
Total cash inflow from operating activities	+2,083
Cash Flow from Investing Activities	+0
Cash Flow from Financing Activities	+0
Net Increase (Decrease) in Cash and Cash Equivalents	**2,083**
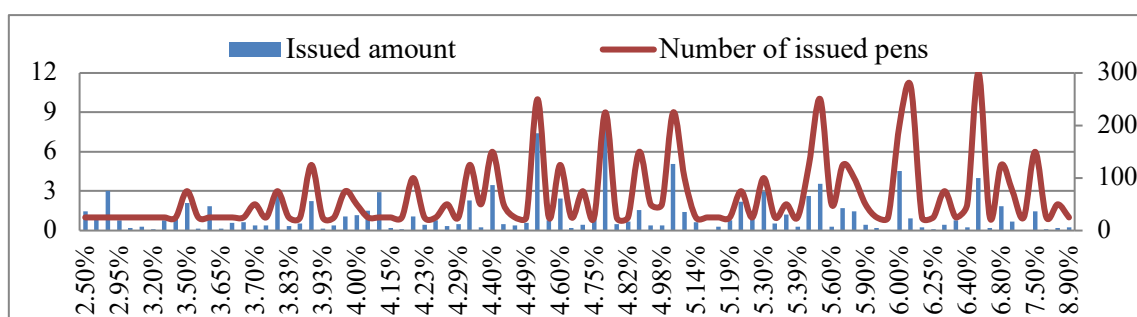
Annexes 5.41 2019 - 2020 Sample analysis chart of real estate asset-backed securities

Annexes 5.42 2019 - 2020 Comparative table of financing costs of products with the same credit grade of different company attributes

Company attribute	2020 Interest rate	2019 Interest rate	平均利率 Average interest rate
Mean value AAA	4.20%	4.97%	4.59%
Private enterprise AAA	5.14%	5.32%	5.22%
State-owned company AAA	3.80%	4.86%	4.63%
Listed companies AAA	4.04%	4.94%	4.44%
Multinational company AAA Multinational company AAA	5.70%		5.70%
Mean value AA+	4.92%	5.88%	5.41%
Private enterprise AA+	5.86%	6.07%	6.02%
State-owned company AA+	4.52%	5.42%	4.80%
Listed companies AA+	4.74%	5.69%	5.10%
Multinational company AA+	6.50%		6.50%
Mean value AA	5.59%	7.03%	5.97%
Private enterprise AA	4.90%	6.30%	5.44%
State-owned company AA	5.34%	6.00%	5.37%

Listed companies AA	6.40%	7.50%	6.86%

Annexes 5.43 2019 - 2020 Comparative table of financing costs of products with different credit grades in companies with different attributes

Company attribute	2020 Interest rate	2019 Interest rate
Private enterprises AAA	5.14%	5.32%
Private enterprises AA+	5.86%	6.07%
Private enterprises AA	4.90%	6.30%
State-owned enterprise AAA	3.80%	4.86%
State-owned enterprise AA+	4.52%	5.42%
State-owned enterprise AA	5.34%	6.00%
Listed companies AAA	4.04%	4.94%
Listed companies AA+	4.74%	5.69%
Listed companies AA	6.40%	7.50%
Mean value AAA	4.20%	4.97%
Mean value AA+	4.92%	5.88%
Mean value AA	5.59%	7.03%

Annexes 5.44 2019 - 2020 Comparative table of financing costs of products with different credit grades in private enterprises

Category	2020	2019
AAA Senior A Tranche	5.10%	5.32%
AAA Senior B Tranche	6.50%	
AA+ Senior A Tranche	5.81%	6.17%
AA+ Senior B Tranche	5.96%	5.99%
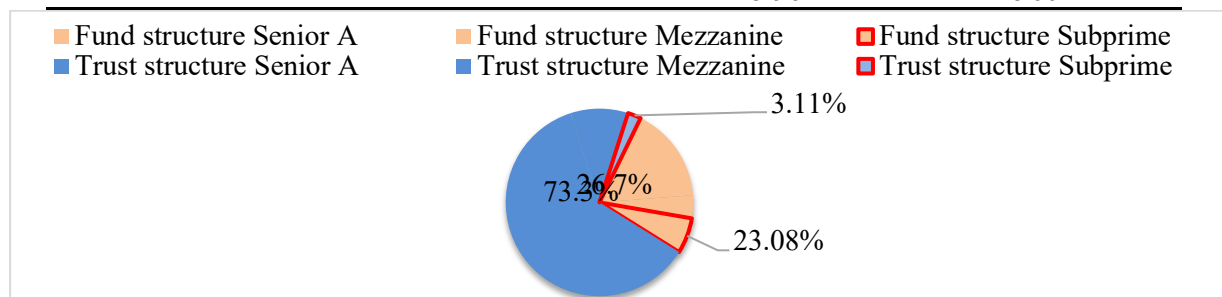
Annexes 5.45 2019 - 2020 Proportion chart of subprime debentures under different trading structures

Annexes 5.46 The proportion of subprime debentures under different transaction structures and principal repayment methods

Transaction structure	Principal repayment	Senior/Subprime	Senior/Mezzanine/Subprime
Trust structure	Pass-through	3.12%	3.89%
	pay-through	3.36%	2.42%
Fund structure	Pass-through	29.24%	24.90%
	pay-through	18.54%	19.39%

Annexes 5.47 2019 - 2020 proportion table of subprime bonds of enterprises with different attributes

Enterprise attribute	Mean value	Senior/Subprime	Senior/ Mezzanine/Subprime
Private enterprise	6.3%	6.2%	6.3%
State-owned enterprise	5.6%	9.7%	2.8%
Listed enterprises	9.8%	7.6%	13.2%

Annexes 5.48 The proportion of subprime debentures of private enterprises in 2019 - 2020

Transaction structure	Mean value	Senior/Subprime	Senior/ Mezzanine/Subprime

Trust structure	4.9%	5.6%	4.4%
Fund structure	11.1%	13.2%	10.8%

Annexes 5.49 The main differences of bankruptcy remote under two structures

Category	Trust structure	Fund structure
Transaction structure	Specific asset management plan + Trust	Specific asset management plan + Fund
Asset disposal mode	Mortgage	Sell

Annexes 5.50 2019 - 2020 comparative table of issuance scale and quantity of different transaction structure, different tranche design

Enterprise attribute	Transaction structure / quantity	Mean value	Senior/ Subprime	Senior/ Mezzanine/ Subprime
private enterprise	Trust structure	77.53%	92.06%	70.46%
	Fund structure	22.47%	7.94%	29.54%
state-owned enterprise	Trust structure	85.96%	70.61%	96.46%
	Fund structure	14.04%	29.39%	3.54%
Listed enterprises	Trust structure	68.73%	78.86%	52.70%
	Fund structure	31.27%	21.14%	47.30%
private enterprise	Trust structure-Issued quantity		12	41
	Fund structure-Issued quantity		4	9
state-owned enterprise	Trust structure-Issued quantity		23	47
	Fund structure-Issued quantity		8	3
Listed enterprises	Trust structure-Issued quantity		83	45
	Fund structure-Issued quantity		33	60

Annexes 5.51 Credit rating comparison table of enterprises with different attributes

Credit rating	private enterprise		state-owned enterprise		Listed enterprises	
	Senior/Sub ordinated	Senior/ Mezzanine/Su bordinated	Senior/Sub ordinated	Senior/ Mezzanine/Su bordinated	Senior/Sub ordinated	Senior/ Mezzanine/Su bordinated
AAA	65.55%	56.89%	82.40%	71.84%	82.83%	71.01%
AA+	28.20%	34.64%	7.87%	20.42%	9.43%	13.03%
AA	0.00%	2.16%	0.00%	5.13%	0.00%	1.95%
A	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%
NR	6.24%	6.30%	9.73%	2.61%	7.73%	13.20%

Annexes 5.52 Credit rating comparison tables of different transaction structures

Credit rating	Trust structure			Fund structure		
	Mean value	Senior/ Subprime	Senior/ Mezzanine/ Subprime	Mean value	Senior/ Subprime	Senior/ Mezzanine/ Subprime
AAA	77.06%	82%	70%	68.05%	75%	64%
AA+	18.26%	14%	24%	7.78%	0%	13%
AA	1.59%	0%	4%	0.32%	0%	1%
A	0.00%	0%	0%	0.77%	0%	1%
NR	3.09%	3%	3%	23.08%	25%	21%

Annexes 5.53 Credit rating comparison table of different transaction structures of private enterprises

Credit	Trust structure	Fund structure

rating	Mean value	Senior/ Subprime	Senior/ Mezzanine/ Subprime	Mean value	Senior/ Subprime	Senior/ Mezzanine/ Subprime
AAA	53.67%	64%	47%	80.62%	87%	80%
AA+	39.56%	31%	45%	8.30%	0%	9%
AA	1.88%	0%	3%			
NR	4.89%	6%	4%	11.08%	13%	11%

Annexes 5.54 2019-2020 Tranche proportion table of two tranche design schemes for enterprises with different attributes

Credit rating	Senior/Mezzanine /Subprime			Senior/Subprime		
	Private enterprises	State-owned enterprise	Listed companies	Private enterprises	State-owned enterprise	Listed companies
Senior A	65.55%	56.89%	82.40%	71.84%	82.83%	71.01%
Mezzanine tranche	28.20%	34.64%	7.87%	20.42%	9.43%	13.03%
Subprime tranche	0.00%	2.16%	0.00%	5.13%	0.00%	1.95%

Annexes 5.55 2019 - 2020 Tranche proportion table of private enterprises

Credit rating	Trust structure				Fund structure			
	2020 Senior /Subprime	2020 Senior/ Mezzanine/Subprime	2019 Senior/ Subprime	2019Senior/ Mezzanine/Subprime	2020 Senior /Subprime	2020 Senior/Mezzanine/ Subprime	2019 Senior/Subprime	2019 Senior/ Mezzanine/Subprime
Senior	92.00%	67.44%	96.40%	50.79%	79.75%	85.71%	88.95%	66.67%
Mezzanine	0.00%	27.77%	0.00%	45.01%	0.00%	1.88%	0.00%	24.24%
Subprime	8.00%	4.79%	3.60%	4.21%	20.25%	7.98%	11.05%	9.09%

Annexes 5.56 "Red Line" control rules

Number	Index	Formula
1	Debt to asset ratio （Excluding Deposit received）	$\dfrac{Total\ liabilities - Deposit\ received}{Total\ assets - Deposit\ received} < 70\%$
2	Net assets debts ratio	$\dfrac{Interest\ bearing\ liabilities - Money\ Funds}{Owners'\ Equity} < 100\%$
3	Cash-to-Short term debt ratio	$\dfrac{Money\ Funds}{Short - term\ debt} \geq 1$

Annexes 5.57 "Four-level" control rules

Number	Interval	Substandard quantity	Control rules
1	Red	3	Interest-bearing liabilities must not increase
2	orange	2	The annual growth rate of interest-bearing liabilities shall not exceed 5%

| 3 | Yellow | 1 | The annual growth rate of interest-bearing liabilities shall not exceed 10% |
| 4 | Green | 0 | The annual growth rate of interest-bearing liabilities shall not exceed 15% |

Annexes 5.58 Distribution of factors affecting the sales of asset securitization products

Index	Program 1	Program 2	Program 3	Program 4	Program 5
Environment	×	√	√	√	√
Policy	√	×	√	√	√
Credit system	√	√	×	√	√
Asset securitization design	√	√	√	×	√
Sale of asset securitization products	×	×	×	×	√

Annexes 5.59 Statistical table of rating agencies' violation and illegal rating punishment documents

Rating agency	Date	Penalty file name	Regulatory body
Dong Fang Jincheng	2020-2-26	Decision [2020] No. 44 on Ordering Corrective Measures against Dong Fang Jincheng International Credit Rating Co., Ltd.	CSRC
Dong Fang Jincheng	2020-12-18	Information on self-discipline punishment of Dealers Association. (decision of the 16th meeting on self-discipline in 2020)	NAFMII
Dong Fang Jincheng	2020-12-11	Executives of Orient Jincheng were investigated and led to a series of corruption cases in the field of credit rating - "Money Rating"	Central Commission for discipline Inspection / National Supervisory Commission
Dong Fang Jincheng	2019-9-12	Information on self-discipline punishment of Dealers Association (deliberated decision of the 10th meeting of self-discipline punishment meeting in 2019)	NAFMII
Dong Fang Jincheng	2020-12-14	Decision on ordering and correcting administrative Decision [2020] No. 188 on Ordering Administrative Regulations to Correct Orient Jincheng International Credit Rating Co., Ltd.	CSRC
Dong Fang Jincheng	2018-12-19	Decision on Ordering Corrective Measures against Dong Fang Jincheng International Credit Rating Co., Ltd. (Beijing [2018] No. 94)	CSRC
Dong Fang Jincheng	2017-9-5	Decision on the issuance of warning letters to Dong Fang Jincheng International Credit Rating Co., Ltd. (Beijing [2017] No. 113)	CSRC
China Chengxin	2018-12-28	Decision on issuing a warning letter to China Chengxin Rating Co., Ltd. (Hu Zheng Jian Jue [2018] No. 150)	CSRC
China Chengxin	2018-1-2	Decision on issuing a warning letter to China Chengxin Rating Co., Ltd. (Hu Zheng	CSRC

		Jian Jue [2018] No. 1)	
China Chengxin	2018-4-13	Decision on issuing a warning letter to China Chengxin Evaluation Co., Ltd. (Shandong [2018] No. 22)	CSRC
China Chengxin	2019-10-17	Decision on issuing a warning letter to China Chengxin Evaluation Co., Ltd. (Jiangsu [2019] No. 83)	CSRC
China Chengxin	2020-12-19	NAFMII self-discipline information (Deliberation and decision of the 18th self-discipline meeting in 2020)	NAFMII
Da Gong International	2021-7-9	Decision on Ordering Corrective Regulatory Measures against Da Gong International Credit Rating Co., Ltd. (Beijing [2021] No. 97)	CSRC
Da Gong International	2021-2-7	Decision [2021] No. 7 on the Measures of Issuing Warning Letters to Da Gong International Credit Rating Co., Ltd.	CSRC
Da Gong International	2020-12-15	Decision [2020] No. 195 on the issuance of warning letters to Da Gong International Credit Rating Co., Ltd.	CSRC
Da Gong International	2018-8-17	NAFMII self-discipline information (Deliberation and decision of the 8th and 9th self-discipline meeting in 2018)	NAFMII
Da Gong International	2018-8-17	Decision on Ordering Corrective Regulatory Measures against Da Gong International Credit Rating Co., Ltd. (Beijing [2018] No. 71)	CSRC
Da Gong International	2017-9-8	Decision on Ordering Corrective Regulatory Measures against Da Gong International Credit Rating Co., Ltd. (Beijing [2017] No. 115)	CSRC
United Credit	2018-2-5	Decision on the issuance of warning letters to Da Gong International Credit Rating Co., Ltd. (Tianjin [2018] No. 1)	CSRC
United Credit	2019-5-16	Decision on issuing a warning letter to United Credit Ratings Co., Ltd. (Heilongjiang Regulatory Measures [2019] No. 15)	CSRC
United Credit	2019-12-25	Decision on Taking Corrective Measures against United Credit Investment Consulting Co., Ltd. (Jin Zheng Jian Measures [2019] No. 37)	CSRC
United Credit	2017-8-7	NAFMII self-discipline information (Deliberation and decision of the 4th self-discipline meeting in 2017)	NAFMII
Shanghai New Century	2018-1-2	Decision on issuing a warning letter to United Credit Ratings Co., Ltd. (Hu Zheng Jian Jue [2018] No. 2)	CSRC
Shanghai New Century	2018-12-29	Decision on issuing a warning letter to United Credit Ratings Co., Ltd. (Hu Zheng Jian Jue [2018] No. 156)	CSRC