

Risk Management and Risk Characteristics Analysis of Credit Asset Securitization in Commercial Banks

Haoyu Shi*

*Gies College of Business, University of Illinois Urbana-Champaign, Champaign, Illinois, 61820,
USA*

shi_haoyu@163.com

**Corresponding author*

Keywords: Commercial Banks, Credit Assets, Risk Management, Risk Characteristics

Abstract: Securitization of credit assets of commercial banks is an innovative risk management model, and its risks mainly come from credit enhancement and insufficient liquidity. China is faced with various problems in the process of developing credit asset securitization. This paper systematically combs and analyzes the research theories in this field at home and abroad, and illustrates a series of difficulties and challenges in developing this business in China with examples. Finally, the paper puts forward relevant suggestions and countermeasures against these obstacles, studies the process of credit asset securitization of commercial banks, and investigates the securitization products. The survey results show that China's securitization products have a single structure, few types, simple design, and credit assets account for the main force, especially corporate bonds. Other products such as mortgage backed securities and re securitized products are relatively scarce, and the proportion of personal loan backed securities is also low. The single product and simple process will inevitably lead to risk concentration. The basic assets of asset securitization in China are mainly enterprise loans. Therefore, we should establish and improve the information disclosure system, strengthen regulatory legislation and professional personnel training to promote the healthy and orderly growth and development of the credit asset securitization market of commercial banks.

1. Introduction

With the development of China's economy and the expansion of the asset business scale of commercial banks, the securitization of credit assets plays an increasingly important role in the financial field. However, due to China's special national conditions, market conditions and regulatory system and other factors, its further development is restricted. Therefore, how to improve the risk management system is one of the biggest challenges facing China's banking industry at present, and also the focus of future research and discussion of commercial banks [1-2]. This paper mainly analyzes and expounds the pre loan evaluation and transaction pricing of banks and puts forward relevant suggestions to better prevent the risk of asset securitization, so as to promote the healthy, orderly and rapid development of the entire credit business industry.

Many scholars have studied the credit assets of commercial banks. In foreign literature, risk

management and control, credit enhancement technology and rating models in the process of credit asset securitization have been introduced in detail, while foreign commercial banks have accumulated rich experience and practical achievements in these fields, and also pointed out that the credit rating evaluation system is an important guarantee to effectively prevent credit crisis and take various measures [3-4]. Domestic scholars started the research on credit asset securitization of commercial banks late, but its development speed is very fast, and they have made many research achievements in theory and practice. The first is about credit risk, market risk and operational financial instruments. Some scholars believe that China's banks face many problems when conducting loan business: first, there is a lack of standardized, unified and effective management system; second, the relevant laws and regulations are not sound. Third, the development of credit asset securitization is hindered by its single product, small scale and other defects [5-6]. Therefore, this paper analyzes the risk management and risk characteristics of credit asset securitization of commercial banks.

Asset securitization is the product of financial innovation, and it also marks the reform of the business model and risk management system of commercial banks. It plays an important role in China. This paper analyzes the problems and reasons in the development of asset securitization, and puts forward relevant suggestions and countermeasures according to these problems, improving the market access mechanism, improving the level of information disclosure, strengthening credit rating supervision and other methods to prevent credit risks. Through legislation to standardize the asset securitization business process and establish a strict and effective legal system and social integrity environment, we will promote the reduction of non-performing loan rate of commercial banks, and achieve a win-win situation of financial innovation and risk management.

2. Discussion on Risk Management and Risk Characteristics Analysis of Credit Asset Securitization in Commercial Banks

2.1 Credit Assets of Commercial Banks

The credit assets of commercial banks refer to the loans issued by banks, that is, the monetary capital formed by the borrower who pays the interest to the designated institutions and financial institutions according to the agreement and transfers its possession, use or income. The definition of credit assets of commercial banks refers to those held by commercial banks for financing loans, which decide whether to accept or sell to investors, and how to deal with risks, including collateral and margin [7-8]. In a broad sense, commercial banks raise funds by issuing securitization products and apply them to other funds, while in a narrow sense, they invest their held to maturity investments in the financial market for financing activities. When issuing bonds, banks in China usually need to consider the market interest rate and yield. When the market interest rate is low, more customers will be attracted to buy the company's shares or other securities products. If the price is too high, the company's profits will be reduced or even the possibility of bankruptcy will be increased, thus affecting its survival and development environment. Therefore, the credit assets of commercial banks will have increased risks. Its main purpose is to obtain cash flow and repay the principal and interest within a certain period. The risk management of credit asset securitization of commercial banks is to predict and analyze the changes in the quantity of base currency to achieve the relevant measures and methods adopted in the process of controlling credit risk, and also need to establish an effective, perfect, efficient and feasible internal rating system and corresponding systems to prevent them [9-10].

2.2 Asset Securitization Risk Management and Risk Characteristics

2.2.1 Risk Management

The risk management of asset securitization refers to that the bank transfers its risk to investors by upgrading the credit of the originator, thereby reducing the loss rate and improving the income. Asset securitization is an important means of financial innovation, but its risk management level also determines the development of the entire industry. There are many problems in the process of securitization of credit assets in China's commercial banks. The lack of relevant laws and regulations to restrict, followed by the lack of supervision and improvement of the market system, the imperfect legal system construction and other aspects will lead to an increase in the probability of operational risk and even a crisis. Due to the imperfect development of China's capital market and the lack of liquidity management experience, China's commercial banks are facing problems such as slow credit growth, rising non-performing loan ratio and declining loan quality. Therefore, asset securitization can effectively solve the problem of high leverage of banks, improve the efficiency of the financial system and enhance the overall economic environment, and promote the healthy and sustainable development of the banking industry is an inevitable choice [11-12]. Therefore, one of the fundamental ways to prevent non-performing loans is to strengthen the credit enhancement work supported by assets and strictly implement relevant regulations and requirements. Commercial banks develop credit asset securitization as a basic business to support the real economy and society and provide various financial products and other related services, At the same time, it is also necessary to take into account the future cash flow situation, future capital demand and other factors to propose corresponding loan collateral or collateral, so as to meet the needs of specific target groups when investing to obtain stable income, thus ensuring their liquidity, security and profitability.

2.2.2 Risk Characteristics

Asset securitization has the following three characteristics:

(1) Market risk. That is, the issuer obtains income by issuing new financial products, and this risk is unpredictable. At present, there are three main ways that can be transferred to investors to avoid investment losses caused by market fluctuations. First, interest rates and exchange rates. The second is to use bond securitization to hedge losses caused by changes in interest rates and exchange rates. The third is the cash flow that is used to finance on the basis of asset pool and sell its holdings or loans to other institutions.

(2) Credit risk and default risk. In the process of asset securitization, the sponsors transfer and distribute the cash flows they own or control to form a special financial instrument - debt portfolio. Because different types of assets have different characteristics, the risks taken by investors are correspondingly different. If the issuer is a bank, it will be short of funds due to lack of liquidity. On the other hand, if the issuer gains additional income by selling the cash it holds, it may incur loss of opportunity cost or deterioration of the financing environment, which will increase the transaction costs of the issuer and the difficulty of management and supervision.

(3) Investment risk. At present, the market of asset-backed securities and basic financial products in China is not mature and there is a lack of perfect institutional norms, investors have insufficient understanding of them and have blind speculation. At the same time, due to asymmetric information, investors can not accurately grasp the real situation and make wrong decisions, which leads to adverse consequences and is also one of the potential risk factors, This is the main reason why the originator may have a credit crisis and thus cause losses.

2.3 Calculation of Loan Credit Risk

Credit risk refers to the operational risk of commercial banks, including default and bankruptcy, default on debtors or third-party guarantees. When issuing credit asset-backed securities, banks conduct investigation and analysis on borrowing enterprises. Through cooperation with other institutions to collect relevant information and obtain funds, we can obtain loans. At the same time, we should also pay attention to whether there is the possibility of bankruptcy, the quality of collateral, changes in the market environment and other factors that cause credit rating assessment risk, so as to determine whether the issuance of this product can bring expected income and investment value to investors. Assuming that the maturity time of the asset-backed securities is T, if the realization income V of the underlying assets in the asset pool is insufficient to pay the principal and interest B of the bonds payable at maturity, a default will occur. That is, the default condition is $V < B$, and the default probability $P = P[V < B]$,

$$P = P\left[\frac{V_T - B_T}{\sigma} < 0\right] \quad (1)$$

σ represents V volatility, default distance $DD = V - B$, we assume that the logarithm of asset realization income follows normal distribution, then according to Merton model assumption, asset realization income follows a random process - standard geometric Brownian motion, then the formula is as follows:

$$dv = \mu V dt + \sigma V dz \quad (2)$$

By integrating it, we can get:

$$V_t = V \exp\left\{\left\{\mu - \frac{1}{2}\sigma^2\right\}t + \sigma Z_t \sqrt{t}\right\} \quad (3)$$

Where μ is the mean value of the instantaneous growth rate of asset realization income; σ : The fluctuation value of the instantaneous growth rate of the asset realization income.

3. Investigation Process of Risk Management and Risk Characteristics Analysis of Credit Asset Securitization in Commercial Banks

3.1 Securitization Process of Credit Assets of Commercial Banks

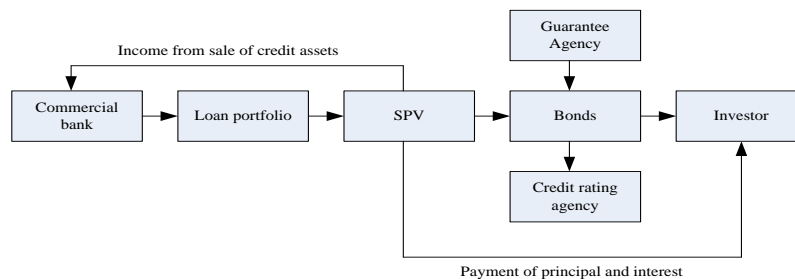


Figure 1: Securities and securities process of credit assets of commercial banks

Asset securitization transaction of commercial banks is a complex and systematic project (as shown in Figure 1), which requires the participation of multiple departments and institutions, including banks, CSRC regulatory authorities and professional guarantee companies. Risk management should be carried out throughout the process. First of all, relevant information should be strictly checked. The second is to determine whether the issuer and the target market

environment match their own development status, and then select the appropriate product design and issuance method to complete the preparation for risk assessment, and finally establish a sound and effective credit rating system and asset supported securitization trading procedures. In the process of securitization of credit assets, the sponsors convert their cash or fixed bills into investment income, but due to changes in market environment, laws and regulations and other factors and defaults, the asset value may decrease, resulting in losses. Therefore, if the investor cannot accurately judge whether the expected future cash flow is true and reliable, and cannot generate enough income to repay the principal and interest of the borrowed capital after maturity, it will cause credit risk.

3.2 Investigation on Securitization Product Structure

In the process of securitization product design, investors' risk preference should be fully considered, assets of different types and sizes should be reasonably allocated, and the risk management ability of participants should be fully investigated, mainly including the following aspects: the first point is to understand the basic information of the target customer and the investment environment. The second point is to understand relevant laws, regulations and policies. The third point is that before the issuance of asset-backed securities, the information of the target customers should be comprehensively evaluated and analyzed in detail, and the risk management ability should be improved by means of information disclosure within an appropriate range according to the actual needs. The degree of risk appetite is determined by analyzing its own potential structure, industry conditions, development prospects and other factors. For the investigation of investors, we should first understand the market demand and development trend, then analyze our own advantages, disadvantages and problems and put forward suggestions, and finally select the appropriate type of portfolio structure according to the specific situation. Before product issuance, it is necessary to clarify the information content such as the credit rating standards and requirements of the target customer group, and constantly improve the relevant laws and regulations during the securitization process to meet the investors' needs for the authenticity, accuracy and integrity of the risk and income assessment report.

4. Investigation and Analysis on Risk Management and Risk Characteristics Analysis of Credit Asset Securitization in Commercial Banks

4.1 Investigation and Analysis of Securitization Product Structure

Table 1: Structure and composition of securitization products

Base Asset Type Distribution	Share pledge repurchase	Margin debt	Housing provident fund loan	Petty loan	Trust usufruct	Accounts receivable	Finance lease	Fee income right
The proportion of situation	2.3%	1.6%	6.8%	7%	8%	14%	27%	28%

Table 1 shows the survey data of securitization product structure.

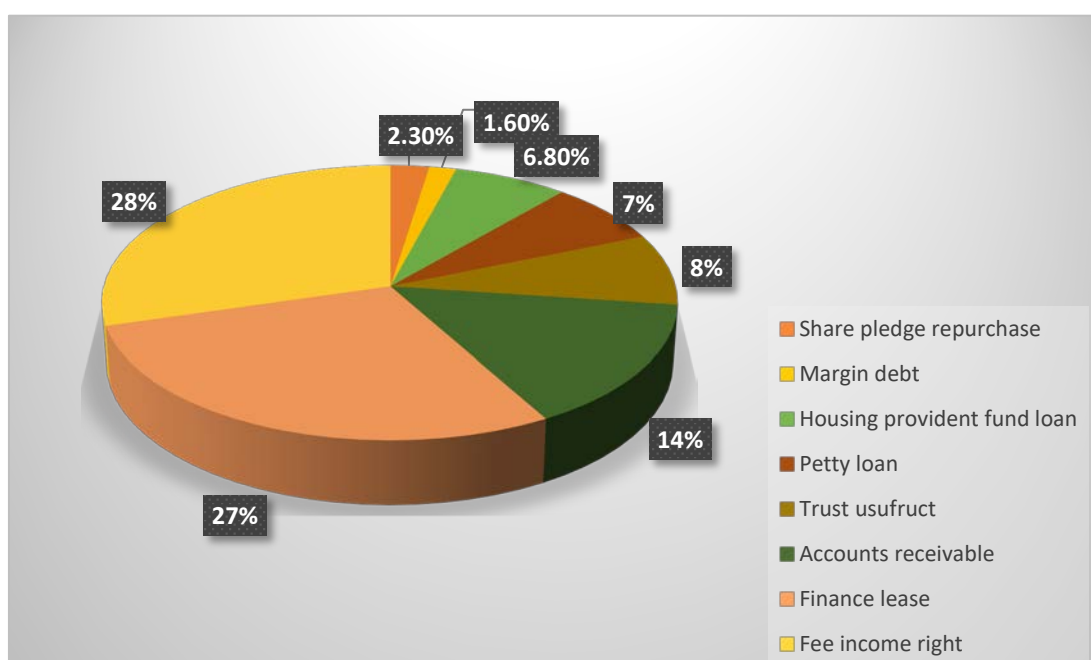


Figure 2: Composition of credit asset securitization products of commercial banks

For the issuance of asset-backed securities, full consideration should be given to the market's development prospects and possible risks in the future, and reasonable and effective structural adjustment measures should be formulated in combination with China's national conditions and industry characteristics. In the design process, we should pay attention to the following issues: First, we should analyze the investor group. Determine the target investment subject through in-depth understanding of factors such as customer groups of different levels and age groups and institutional investors' needs. Secondly, when selecting the variety and quantity of securitization products, it is necessary to fully consider the changes in market environment and its own capital status to ensure the sustainable development and stability of asset support. It can be seen from Figure 2 that China's securitization products have a single structure, few types, simple design, and credit assets, especially corporate bonds, account for the majority. Others, such as mortgage backed securities and re securitized products, are relatively scarce. The proportion of personal loan backed securities is also low. The single product and simple process will inevitably lead to risk concentration. The basic assets of asset securitization in China are mainly enterprise loans.

5. Conclusion

With the continuous development of China's economy, asset securitization of commercial banks has become an indispensable and important means in financial innovation and risk management reform. However, many factors such as imperfect domestic laws and regulations, insufficient supervision and lack of professionals restrict the development of credit backed securities business. This paper analyzes and finds out the reasons for these problems by studying various problems that the issuers of asset-backed bonds at home and abroad will encounter in the process of issuance, as well as the solutions and suggestions, so that China's commercial banks can actively and effectively develop asset securitization products to avoid risks and promote their sustainable, healthy and stable development.

References

- [1] Oleg Badunenko, Subal C. Kumbhakar, Ana Lozano-Vivas: *Achieving a sustainable cost-efficient business model in banking: The case of European commercial banks*. *Eur. J. Oper. Res.* 293(2): 773-785 (2021).
- [2] Md. Imran Hossain: *Effects of E-Banking Adoption on the Financial Performance of State-Owned Commercial Banks in Bangladesh*. *Inf. Resour. Manag. J.* 34(4): 1-20 (2021).
- [3] Javier Reig-Mullor, José M. Brotons Martínez: *The evaluation performance for commercial banks by intuitionistic fuzzy numbers: the case of Spain*. *Soft Comput.* 25(14): 9061-9075 (2021).
- [4] Hilary Obioma Ibegbulem. *The Practice of Total Quality Management and Sustainable Competitive Advantage: Perspectives from Commercial Banks in Nigeria*. *Webology* 18(2): 709-728 (2021).
- [5] Akber Aman Shah, Desheng Dash Wu, Vladimir Korotkov, Gul Jabeen: *Do Commercial Banks Benefited From the Belt and Road Initiative? A Three-Stage DEA-Tobit-NN Analysis*. *IEEE Access* 7: 37936-37949 (2019).
- [6] Hussein Moselhy Syead Ahmed, Ali Ahmed Abdelkader. *The Mediating Role of Repositioning on The relationship Between Electronic Integrating Communication Marketing (E-IMC) and Loyalty: The Case of Commercial Banks in Egypt*. *Int. J. Online Mark.* 9(1): 1-23 (2019).
- [7] Thomas Lambert: *Lobbying on Regulatory Enforcement Actions: Evidence from U.S. Commercial and Savings Banks*. *Manag. Sci.* 65(6): 2545-2572 (2019).
- [8] Jamal Ouenniche, Skarleth Carrales: *Assessing efficiency profiles of UK commercial banks: a DEA analysis with regression-based feedback*. *Ann. Oper. Res.* 266(1-2): 551-587 (2018).
- [9] Grant E. Muller: *An Optimal Investment Strategy and Multiperiod Deposit Insurance Pricing Model for Commercial Banks*. *J. Appl. Math.* 2018: 8942050:1-8942050:10 (2018).
- [10] Mira Thoumy, Joelle Moubarak. *Project Manager Assignment and Its Impact on Multiple Project Management Effectiveness: An Empirical Study of IT Projects in the Lebanese Commercial Banks*. *Int. J. Inf. Technol. Proj. Manag.* 8(4): 46-65 (2017).
- [11] Yusuf Tansel İç, Mustafa Yurdakul, Esra Pehlivan: *Development of a hybrid financial performance measurement model using AHP and DOE methods for Turkish commercial banks*. *Soft Comput.* 26(6): 2959-2979 (2022).
- [12] Aziz Kutlar, Ali Kabasakal, Mehmet Sena Ekici: *Efficiency of commercial banks in Turkey and their comparison: application of DEA with Tobit analysis*. *Int. J. Math. Oper. Res.* 10(1): 84-103 (2017).