



IJSRM

INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH METHODOLOGY

An Official Publication of Human Journals




Human Journals

Research Article


October 2018 Vol.:10, Issue:4

© All rights are reserved by Xuefeng Zhang

Research on the Countermeasures to Promote the Development of Housing Mortgage Securitization — Taking Zhejiang Province in China as an Example



IJSRM
INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH METHODOLOGY
An Official Publication of Human Journals



Xuefeng Zhang

*College of Business, Jiaxing University, Jiaxing,
Zhejiang Province, China*

Submission: 22 September 2018

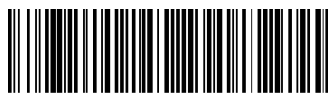
Accepted: 30 September 2018

Published: 30 October 2018

Keywords: Financial Innovation, Housing Mortgage, Securitization, Zhejiang Province

ABSTRACT

Mortgage securitization can be applied to digest stock housing, revitalize stock assets and optimize the asset-liability structure of commercial banks. The scale of China's housing mortgage loans has continued to expand in recent years, but the potential risks of securitization of housing mortgage loans have gradually begun to emerge with the adjustment of economic policies. This article will take Zhejiang Province in China as an example to analyze the present situation of personal housing mortgage securitization, and then discuss the main obstacles to the slow development of personal housing mortgage securitization. Finally, it can effectively assess the main existing problems and propose relevant policy recommendations.



HUMAN JOURNALS

www.ijsrm.humanjournals.com

JEL Classification: R23, R31

1. INTRODUCTION

The asset securitization that began in the 1970s is considered to be one of the most important financial innovation and financial instruments in the world's financial sector in the past 40 years. From the beginning of the financial crisis in 2008 to 2013, China's Residential Mortgage-Backed Securitization (RMBS) was suspended. In 2014, China restarted the RMBS business. Asset securitization began to flourish. The scale of issuance and circulation increased year by year, becoming a very important variety in the credit market.

The circulation of commercial banks' RMBS has increased year by year since 2014 and the scale has been expanding. In 2016, a total of 15 single products were issued with a total amount of 15.15 billion dollars; in 2017, a total of 19 single products were issued, and the issued amount reached 25.88 billion dollars (Figure 1), becoming the top spot in the Asset Backed Securitization (ABS) market circulation.

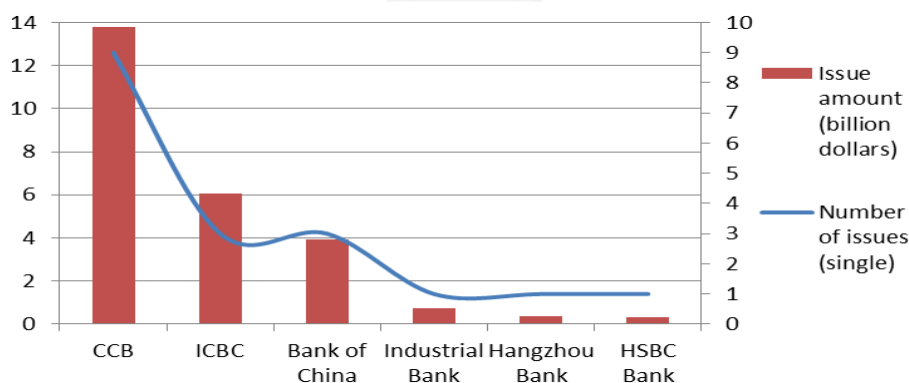


Fig. 1: Number and amount of RMBS issued by various institutions in 2017

With the development of China's social economy, the real estate market has also shown a hot development trend, making the scale of housing mortgage loans continue to expand. However, the economic growth has slowed down with the adjustment of economic policies in recent years, and the potential risks of securitization of mortgage loans have gradually begun to emerge. At present, Zhejiang Province in China has only issued 4 single housing mortgage loan-backed securities. So what is the main reason for the slow development of Zhejiang's

housing mortgage loan securitization? How to effectively assess the development risks of the mortgage-backed securitization business in combination with the actual situation in China and Zhejiang Province and do a good job of prevention? These are also the main issues to be studied in this paper.

2. LITERATURE

2.1 Basic characteristics of securitization of housing mortgage loans

Deng Haiqing^[1] pointed out three reasons that cannot be ignored in the collapse of the mortgage-backed securitization market during the subprime mortgage crisis. One is that the basic asset mortgage loan ignores the quality problem. Another one is the issuer. The quality of the assets was not confirmed before the issuance. And the third one is that the assessment agency does not fulfill its responsibilities and misleads the investors. Liu Qianqian^[2] believes that mortgage securitization has a high financial attribute and the basic loan has a large prepayment risk. The long-term risk exposure and the default loss rate are not high so that it is difficult to assess the risks. Frank and Dennis^[3], Diana and Wayne^[4] also conducted related research.

2.2 Pricing of Home Mortgage Securitization Products

Kaloty *et al*^[5] mainly studied the asset-backed securities based on the no-arbitrage principle and constructed a pricing model accordingly. In this model, the borrower of the investor and the underlying asset applies different discount rates, and because of the differences between the borrowers, the boundary conditions for their early repayment are also different. Frank J. Fabozzi^[6] introduced the operation mode, trading strategy, pricing and variety in the process of research on the theory of mortgage securitization, and selected three representative securities. Meanwhile, the relevant systems of US mortgage-backed securitization were described in detail. Joseph^[7] and Chechun^[8] have also conducted research in this area.

2.3 Risk Management of Housing Mortgage Securitization

Lambie Christian^[9] studied the role of asset securitization in the economic crisis and

concluded that risk assessment is a key part of asset securitization transactions. To effectively assess risks, we must continue to make the information on asset securitization public and transparent. Michael^[10], Pennington, and Michael^[11] argue that lending institutions' financing restrictions, investor demand and the willingness of lenders to capture market share are the main factors affecting the development of the mortgage-backed securitization market. Due to the outbreak of the US subprime mortgage crisis and the research on the credit risk of mortgage-backed securitization have been increasing in the international arena. Through the investigation and analysis of subprime mortgage securities, Petersen^[12] believes that further research on the credit risk of mortgage securitization can not only effectively avoid financial risks, but also can make the valuation of mortgage securitization more accurate.

2.4 Literature Review

According to the review of the previous literature, in terms of securitization of housing mortgage loans, many domestic researches remain at the stage of exploration mode. Regardless of the economic level or the social background, China and other countries have great differences. In the development of mortgage securitization, there are bound to be different risks. In the previous research results, few studies on housing mortgage loan securitization under the domestic economic situation have been explored and analyzed from a micro perspective. This article will analyze the status quo of individual housing mortgage loan securitization in Zhejiang Province from the perspective of micro and macro perspective, and then discuss the main obstacles to the slow development of personal housing mortgage securitization. Finally, effectively assess the current main problems in light of the actual situation and put forward relevant policy recommendations.

3. BACKGROUND AND PROBLEMS

3.1 Residents' incomes increase rapidly and investment channels are narrow

Zhejiang Province is located in the eastern coastal areas of China and has a relatively developed economy. As of the end of 2017, the balance of savings deposits of urban and rural residents in Zhejiang Province reached 618.24 billion dollars (Table 1), which increased by

almost 10% per year from 2004 to 2017. The increase in residents' savings deposits has brought a lot of funds to the banks, but it also shows that the residents' investment channels are still relatively narrow, and more financial products need to be developed for the income-increasing residents to invest.

Table 1: Balance and growth of savings deposits of residents in Zhejiang Province (2010-2017)

years	2010	2011	2012	2013	2014	2015	2016	2017
Savings balance (billion dollars)	312.31	355.61	400.10	438.23	464.64	518.46	576.93	618.24
Savings deposits (billion dollars)	42.10	43.30	44.49	38.12	26.42	53.82	58.46	41.31
Growth rate (%)	15.6	13.8	12.5	9.5	6	11.5	11.3	7.1%

3.2 Status of home mortgage loans

The amount of housing mortgage loans in Zhejiang increased from 319.35 billion dollars in 2015 to 512.84 billion dollars in 2017, and the annual growth rate was as high as 26.7% (Figure 2). The demand for mortgage funds for residents to purchase houses continued to increase. To a certain extent, this indicates that Zhejiang's housing mortgage loans have a certain depth and breadth in the primary market.

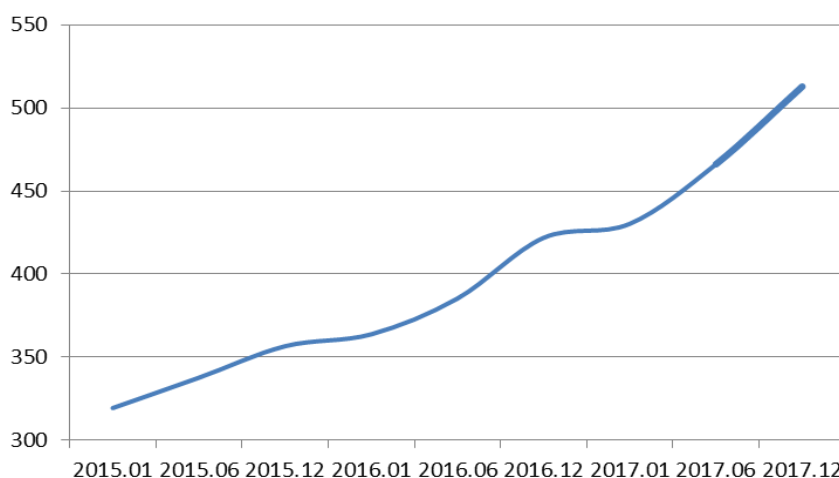


Fig. 2: Growth of housing mortgage loan balance in Zhejiang (billion dollars)

3.3 Development of RMBS in Zhejiang Province

Zhejiang is one of the first batches of pilot provinces for China's provident fund housing mortgage loan securitization. On October 22, 2015, Hangzhou Provident Fund Housing Loan Equity Assets Securities was successfully issued on the Shanghai Stock Exchange. The financing amount was 75.75 million dollars, the maximum period for issuing products was 1.5 years, and the annual comprehensive cost of securities was 4.57%. Therefore, it is assessed as AAA class securities.

The first phase of personal housing mortgage loan-backed securities issued by Hangzhou Provident Fund Management Center in 2016 was 151.47 million dollars, and a total of 7290 personal housing mortgage loans were issued. The mortgages for the pool loans were all located in Hangzhou (Capital city of Zhejiang Province). The value ratio of weighted initial loans is 44.23% which is already at a low level and has alleviated the expected loss to some extent.

Hang Ying's first personal housing mortgage loan-backed securities in 2017 was issued by Hangzhou Bank on March 20, 2017. Financial institutions and investors actively participated in a total of 1.6 times oversubscription. The final priority bookkeeping rate was maintained at 4.8%, which was lower than the benchmark lending rate by 10 basis points. The interest rate was significantly lower than the market expectation by nearly 30 basis points. The issue amount is 606.06 million dollars, which bears interest at floating rates.

4. DISCUSSION AND ANALYSIS

4.1 Development is slower

At present, there are only 4 single housing mortgage loan-backed securities in Zhejiang Province: "2015 Hangzhou Housing Provident Fund Loan Asset-backed Securities", "Hangzhou Housing Provident Fund 2016 First Phase Personal Loan Asset-backed Securities", "Huzhou Provident Fund 2016 First Phase" Personal housing loan asset-backed securities" (Table 2) and "Hang Ying 2017 first phase personal housing mortgage loan-backed

securities" (Table 3). The financing scale of these four single RMBS products is only 2820.91 million dollars, compared with the issuance amount of the national market RMBS total issued amount of 25.88 billion dollars, the issuance scale is relatively small.

Table 2: Issuance of personal loan asset-backed securities for the first phase of Hangzhou Housing Provident Fund in 2016

Securities	Amount (million dollars)	Total proportion (%)	Coupon rate	Credit rating
Priority A-1 security	909.09	60.02	Floating rate	AAA
Priority A-2 security	50.00	33.01	Floating rate	AAA
Secondary securities	10.56	6.97	-	Not rated
Issue amount	151.47	100.00	-	-

Table 3: Issuance of first period personal housing mortgage loan asset-backed securities of Hang Ying in 2017

Securities	Amount (million dollars)	Total proportion (%)	Coupon rate	Credit rating
Priority asset support securities	541.97	88.15	Benchmark rate + basic spread	AAA
Secondary sset-backed securities	72.86	11.85	No coupon rate	Not rated
Issue amount	614.83	100.00	-	-

4.2 Early payment risk

The prepayment risk is due to the instability of some or all of the cash flow caused by changes in the loan balance and expected earnings and changes in the investor's investment risk at any time prior to the loan term. If the current market interest rate is lower than the future coupon rate of the issued bonds, the issuer may also choose to repay some or all of the bonds in advance, and then issue bonds with lower interest rates to obtain a spread. The advance payment behavior increases the instability of the cash flow generated by the mortgage-backed securities asset pool which also increases the borrower's cost. However, the borrower cannot expect to invest in the loan in advance, resulting in idle funds and reducing

people's expected repayment. It also affects the pricing of securities, making it difficult to determine accurate pricing.

(1) Settle all balances at a certain time

Assuming that the borrower wants to pay off all the balances in the k-th month, he will need to repay the balance in addition to the interest that needs to be repaid in the current month:

$$P_k = A \left[1 - \frac{(1+r)^k - 1}{(1+r)^n - 1} \right] \tag{Formula (1)}$$

Bank dynamic interest loss is:

$$Q_k = A \frac{(1+r)^{n-k+1} - (n-k+1)r - 1}{(1+r)[(1+r)^n - 1]} \tag{Formula (2)}$$

It can be seen from Table 4 that the earlier the month in which the borrower repays in advance under the same bank loan, the greater the dynamic interest loss of the bank, and vice versa. When the repayment of prepayments exceeds the 120th month, the bank's dynamic interest present value loss is less than 20%.

Table 4: Loss of interest on all balances at a certain time

Monthly repayment	Lending rate	Present value of interest (thousand dollars)	loss Proportion to total interest
24	4.90%	48.67	78.00%
36	4.90%	42.62	68.30%
48	4.90%	37.07	59.40%
72	4.90%	27.38	43.87%
84	4.90%	23.19	37.16%
108	4.90%	16.04	25.70%
120	4.90%	13.03	20.88%

(2) Paying part of the balance at a certain time, but not shortening the total loan period

If the lender wants to repay part of the loan amount in advance in a certain month, and the

remaining loan repayment period and other conditions remain unchanged, then the monthly equal repayment amount is:

$$M_1 = M - A_0 \frac{r(1+r)^{n-k}}{(1+r)^{n-k} - 1}$$

Where A_0 is the prepayment amount at the k -th month, and the calculation formula is:

$$A_k = M \times \frac{(1+r)^{n-k+1} - 1}{(1+r)^{n-k+1}} \tag{Formula (4)}$$

Thus the total loss of the bank's dynamic interest is:

$$Q_k = A_0 \frac{(1+r)^{n-k+1} - (n-k+1)r - 1}{(1+r)^{n+1} - (1+r)^{k+1}} \tag{Formula (5)}$$

Table 5 is the present value of the bank's interest loss, assuming the borrower borrows 150 thousand dollars and then pays 30.3 thousand dollars at a time, appropriately reducing the current monthly repayment amount but not shortening the loan term.

Table 5: Interest loss at the time of repayment of part of the balance

Month of repayment of part of the loan	Lending rates	The present value of interest loss (thousand dollars)
24	4.90%	10.38
36	4.90%	9.42
48	4.90%	8.52
72	4.90%	6.89
84	4.90%	6.15
108	4.90%	4.81
120	4.90%	4.20

(3) Shorten the repayment period while paying part of the balance at a certain time

If the borrower repays part of the loan at a certain time and shortens the repayment period, then according to the formula for monthly repayment, the monthly repayment amount is::

Formula (6)

$$M_2 = \left[A \frac{(1+r)^{n-k} - 1}{r(1+r)^{n-k}} - A_0 \right] \frac{r(1+r)^h}{(1+r)^h - 1}$$

Where k is the month of early repayment, A_0 is the amount of repayment in advance, and h is the number of months ($k+1 \leq h \leq n-k$) that still need to be repaid. The bank's dynamic interest loss is:

Formula (7)

$$Q_k = A \frac{(1+r)^{n-k} - (n-k+1)r - 1}{r(1+r)^{n+1}} - \frac{(1+r)^{h+1} - (h+1)r - 1}{r(1+r)^{n+1} [(1+r)^h - 1]} \left[(A - A_0 r)(1+r)^{n-k} - A \right]$$

In most business situations $M_2 = M$, the monthly repayment amount remains unchanged after repaying part of the payment in advance. Then the dynamic interest loss is:

Formula (8)

$$Q_k = A \frac{(1+r)^{n-k+1} - (n-k+1)r - 1}{(1+r)[(1+r)^n - 1]} - A \frac{(1+r)^{h+1} - (h+1)r - 1}{(1+r)^{h+k-n+1} [(1+r)^n - 1]}$$

Table 6 is the present value of the bank's interest loss when the loan amount is 151.52 thousand dollars, and the one-time payment of 30.3 thousand dollars at a certain time, but the monthly repayment amount is not changed, and the repayment period is shortened.

Table 6: Interest loss under repayment of part of the balance and shortening the period

Repayment month	Lending rates	Remaining repayment months	Present value of interest loss (thousand dollars)
24	4.90%	140	23.79
36	4.90%	131	21.37
48	4.90%	121	19.34
72	4.90%	102	15.35
84	4.90%	93	13.47
108	4.90%	83	8.82
120	4.90%	73	7.56

It can be concluded from Tables 4, 5 and 6 that no matter what form of early repayment, it will cause losses to the bank's interest income.

It can be seen from Table 7 that there were prepayment and arrears recovery, as well as the amount occupied a certain proportion of the asset pool in the first year after the release of Hangzhou Ying First Home Mortgage Backed Assets-backed Securities in 2017. This

indicates that there is a certain risk of early payment in the mortgage securitization, and it should not be underestimated.

Table 7: Mortgage loan securitization asset pool cash inflows of first phase of Hang Ying in 2017

	Situation type	The reporting period (million dollars)
income	Normal recycling	23.58
	Reimbursement in advance	0.12
	Arrears	0.61
principal	Normal recycling	52.73
	Reimbursement in advance	78.81
	Arrears	1.45

4.3 Basic asset yield is too low

Judging from the current RMBS products issued in Zhejiang, the weighted average interest rate of the pooled loans is low and the repayment of securities is affected by its actual issuance rate. There is a certain amount of interest on the pooled assets that may not be able to fully pay the relevant expenses and interest expenses on the securities (Tables 8 and 9), resulting in the need to make up with the principal. The weighted average loan interest rate of Hangzhou Ying's first personal housing mortgage loan-backed securities asset pool in 2017 was 4.48%, while the bank loan interest rate for the five-year period or above in 2017 was 4.90%. This will make financial institutions such as banks less motivated to issue RMBS.

Table 8: Asset pool of Hang Ying's first phase in 2017

	Subjects	Amount (million dollars)
Income account	Handling fee	24.31
	Other income	0.03
	Total	24.34
Principal account	Principal	133.00
Tax expenditure	Total service expenditure	2.14
	Total interest on securities interest	17.46
Securities payment	Total principal of securities	127.69

Table 9: Cost of the first phase of Hang Ying in 2017

Cost	Current amount(million dollars)
Loan service fee	1.72
Issuing registration service fee	0.07
Lawyer fee	0.05
Accounting service fee	0.05
Rating fee	0.14
Pay against	0.01
Total	0.20

Source: Housing Mortgage Financial Statement for the First Phase of Hang Ying in 2017

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

As one of the pilot provinces of asset securitization in Zhejiang Province, its personal housing mortgage asset-backed securities business has developed to a certain extent in recent years. However, its number of issuance and issuance scale are not large and there are still many problems. There are three main problems: First, the development speed of RMBS is relatively slow; second, the rate of return on basic assets of mortgage-backed securities is not high, which leads to the decrease of the enthusiasm of banks and other financial institutions; Third, the existence of prepayment risk will increase the possibility of issuers facing losses and the benefits will decrease.

5.2 Policy recommendations

(1) Establish a professional SPV company

The most important part of mortgage securitization is SPV, which is the most important component of mortgage-backed securitization and has a decisive impact on its operational efficiency and future development. The development of SPV should follow the national conditions. At present, the degree of securitization in China is still not high and acceptance is low. Therefore, a semi-official SPV mortgage-backed securities company can be established

by the state. On the one hand, this can reflect the government's support for development in this area. It can enhance people's confidence in SPV and make mortgage-backed securities more easily accepted by the market; on the other hand, China does not have a comprehensive risk prevention system, the support from government can reduce the risk of SPV development.

(2) Establish and improve the prepayment penalty mechanism

Due to the premature repayment risk in the securitization of personal housing mortgages, this will result in the bank suffering the corresponding loss of interest due to the borrower's early repayment. This is a very important reason for the slow development of personal housing mortgage loan securitization in Zhejiang Province. Therefore, it is necessary to establish and improve the penalty mechanism for prepayment of China's housing mortgage loans, both to ensure the legitimate interests of banks and other financial institutions and to ensure that borrowers will not suffer loss.

(3) Create a good external environment

After securing the conditions of housing mortgage, it is necessary to create a relatively good and fair external environment to ensure its safe implementation. First, establish an authoritative and credible guarantee institution to provide guarantees for mortgage loans in the primary market. Second, strengthen financial supervision and guide more institutional investors into the mortgage-backed securities market. Third, rectify the intermediary service agencies, improve the service system, and enhance their service capabilities. Finally, tax incentives can be used to activate the market and promote its prosperity and development.

ACKNOWLEDGEMENTS

This research was supported by Zhejiang Provincial Natural Science Foundation of China under Grant No. LQ14G030019. Meanwhile, the author would like to thank the anonymous reviewers and the editors for their hard work. The author is grateful for their support.

REFERENCES

- [1] Deng Haiqing, Hu Yufeng. Analysis and Comparison of China's Asset Securitization Models. Bonds, 2013(08):13-16.
- [2] Liu Qianqian, Li Ming. The problems of the existence of personal housing mortgage loans in China and the research on the countermeasures. West China Finance, 2015 (08): 27-29.
- [3] Frank J. Fabozzi, Dennis Vink. The information content of three credit ratings: the case of European residential mortgage-backed securities. The European Journal of Finance, 2015,21(3):90-103.
- [4] Diana Hancock, Wayne Passmore. Cost of funds indexed mortgage contracts with government-backed catastrophic insurance (COFI-Cats): A realistic alternative to the 30-year fixed-rate mortgage. Journal of Economics and Business, 2016,84(4):23-42.
- [5] Kaloty, Yang, Frank J. Fabozzi. Exploring rating shopping for european triple a senior structured finance securities. Finance Research Letters, 2004,20(3):48-85.
- [6] Frank J. Fabozzi, Dennis Vink. The information content of three credit ratings: the case of European residential mortgage-backed securities. The European Journal of Finance, 2015,21(3):90-103.
- [7] Joseph C. Hu, Asset securitization: Principles and practice. John Wiley & Sons (Asia) Pte. Led, 2011,9(2):39-51.
- [8] Chechun Lin. A neural network approach for credit risk evaluation. The Quarterly Review of Economics and Finance, 2013,48(4):733-755.
- [9] Lambie Christian. How France and Germany Try to Benefit from Asset Securitization. Depaul Business & Commercial Law Journal, 2009,8(7)319-347.
- [10] Michael Pryke. Mortgage backed securitization in the United Kingdom. Housing Policy Debate, 2010,5(3):307-342.
- [11] Pennington Cross, Michael Burke. The Canadian Securitization Market 2010. Asset Securitization Report, 2014,9(12):65-73.
- [12] M.A. Petersen, M. P. Mulaudzi, J. Mukuddem-Petersen, I. M. Schoeman, B. de Waal. Stochastic control of credit default insurance for subprime residential mortgage backed securities. Optimal Control Applications and Methods, 2011,33(4):279-294.