

An Empirical Study on the Impact of Loan Securitization on Bank Profitability: Evidence from Chinese Commercial Banks

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Abstract: This paper employs a panel data model by the sample of 72 Chinese commercial banks between 2011 and 2017, to test empirically the impact of loan securitization on bank profitability. The results show that loan securitization cannot improve the profitability of commercial banks in China.

1. Introduction

As an important financial innovation tool, asset securitization first appeared in the US housing mortgage market in the late 1960s. It was launched in Chinese financial market in 2005, since then has experienced a tortuous development process. Affected by the financial crisis from 2008, the pilot had been in suspension for years. With the promotion by regulatory departments, asset securitization in China has entered an accelerated development period since restart, with the rapid expansion of issuance scale and the gradual increase of product types. By the end of 2017, RMB 170,062 million of asset-backed securities had been issued in China, including RMB 138,394 million initiated by banks. Predictably, as China is promoting financial market reforms and interest rate marketization, loan securitization of commercial banks will be further developed. In this context, to examine the effects of loan securitization on bank performance by historical data is necessary. This paper adopts a panel data model in an attempt to investigate whether loan securitization can improve the profitability of commercial banks in China or not.

2. Literature Review

Early studies of securitization effects focused on its potential economic benefits. Lockwood et al. (1996) examine changes in wealth for banks that securitize assets, and suggest that the cash inflow from the issuance of asset-backed securities can be used to retire existing debt, which in turn reduces interest expense and increases reported earnings. Thomas (1999) conducts tests of stockholder and bondholder wealth changes upon the securitization of non-government guaranteed assets and finds that securitization is significantly wealth creating for stockholders, adding 5% per transaction to the excess returns of the stock.

Another branch of research has focused on the performance of securitization originating banks. Jiangli & Pritsker (2008) use data from 2001-2007 to assess the impact of mortgage and other forms of asset securitization on the profitability of US bank holding companies. They find that securitization techniques increase bank profitability, and the results suggest that securitization techniques have played a positive role. Michalak & Uhde (2012) empirically investigate a sample of 60 stock-listed bank holdings in the EU from 1997 to 2007, and find a negative impact of securitization on bank profitability. Retaining the major part of credit default risk and following a riskier reinvestment strategy ex post may result in a decrease in bank profitability. Using predominantly pre-crisis US commercial bank data, Casu et al. (2013) employ a propensity score matching approach to analyze whether individual banks did improve their performance through securitization. The results show that, on average, securitizing banks tend to be more profitable institutions.

3. Data and Methodology

3.1 Variable Selection.

A summary of all the variables is presented in Table 1 below. The dummy variable Sec takes on the value of 1 when a bank *i* issues at least one asset-backed security in year *t* and 0 otherwise.

Table 1 Variables summary

Variable	Description	Proxy	Data Source
Dependent variables			
ROA	return on assets	profitability	CSMAR
ROE	return on equity	profitability	CSMAR
Independent variable			
Sec	1 securitization; 0 otherwise	securitization	WIND
Control variables			
NPLR	non-performing loan ratio	risk exposure	CSMAR
LDR	loan-to-deposit ratio	liquidity	CSMAR
CIR	cost-to-income ratio	operation efficiency	CSMAR
NIIR	non-interest income ratio	revenue diversification	CSMAR
LnTA	logarithm of total assets	bank size	CSMAR
EAR	equity-to-asset ratio	asset structure	CSMAR

3.2 Empirical model.

The regression analysis is based on the sample of 72 securitizing banks over the period from 2011 to 2017, which constructs a balanced panel; however, some observations in 2017 are missing because the latest annual reports of some banks have not been updated yet. Each regression uses bank fixed effects with robust standard errors clustered at the bank level. The main purpose of applying robust standard errors is to modify the heteroscedasticity and thus to provide more reliable and stable results. The regression model is specified as follows:

$$y_{it} = c + \beta_1 Sec_{it} + \sum \beta_2 Ctrl_{it} + \varepsilon_{it}$$

Where *c* is the intercept term, ε is the error term, with $i=1,...,N$, $t=1,...,T$; thus, Sec_{it} represents the securitization dummy of bank *i* in year *t*, and $Ctrl_{it}$ is the set of the control variables which contains mostly banks' individual characteristics; β is a vector of coefficients associated with the regressor vector including the explanatory variables as described in Table 1.

4. Empirical Results

According to correlation matrix, except the largest 0.4009 between Sec and LnTA, the absolute values of pairwise correlation coefficients between the remaining variables are all below 0.3, which is suggesting that multicollinearity problems are not severe or non-existent. In general, multicollinearity is a problem when the correlation is above 0.80, which is not the case here.

Table 2 Correlation Matrix

	Sec	NPLR	LDR	CIR	NIIR	LnTA	EAR
Sec	1						
NPLR	0.1937***	1					
LDR	0.2019***	0.2287***	1				
CIR	-0.1647***	0.0429	-0.1027**	1			
NIIR	0.2747***	0.0366	0.1325***	-0.0827*	1		
LnTA	0.4009***	-0.0450	0.2740***	-0.1925***	0.2752***	1	
EAR	-0.0289	0.1878***	0.2264***	-0.0442	-0.1080**	-0.2719***	1

* $p < .1$, ** $p < .05$, *** $p < .01$

Before regression analysis, stationarity test of data series is needed, determining whether there is a unit root in data series, to avoid the “pseudo regression” problem. This paper uses the method of ADF Fisher-type test to check the stationarity of variables. The results (not reported and provided on request) show that the null hypothesis of containing unit root is rejected, all variables are level stationary at 1% significant level.

According to Hausman test, $\chi^2(7)=110.10$ with $p(\chi^2)=0.00$, so fixed effects model is adopted. Main regression results are reported in Table 3, where (1) (3) (5) columns report the estimates for the dependent variable ROA while (2) (4) (6) columns for the dependent variable ROE. One possible concern is that the results might differ across banks of different size. To examine this argument, this paper splits the sample into two sub-samples: big banks (18 banks that are national banks including 5 state-owned banks plus 12 joint-stock banks plus Postal Savings Bank) and small banks (the remaining 54 banks that are regional banks instead of national).

The regression coefficients on profitability are found to be negative and mostly significant. In other words, banks have lower return on assets (or equity) after loan securitization, which is not consistent with what is expected. The reason may be that, loan securitization is to strip assets from the balance sheet while transferring their credit risk so that it can optimize the structure of assets. As the loans securitized are not within bank’s assets, securitization cannot directly bring book profits to banks. In the short term, it may to some extent cause the bank’s profitability to be reduced due to fees in the process of issuance as well as expenses of repurchase in the process of transaction which increase the cost of loan securitization for banks. Especially when the scale of loan securitization in China is very small, the scale effect cannot be achieved so that the cost cannot be reduced. In practice, due to the requirements of China Banking Regulatory Commission (CBRC), commercial banks are subject to securitizing loans with higher credit quality, while retaining the loans of lower credit quality, which also reduces the banks’ level of return. In addition, the bank also needs to repay the principal and interest of the asset-backed securities. The more loans securitized, in the short term, the lower profitability of the bank because of the pressure of repayment.

In terms of the sub-samples, for the big banks, the coefficient on ROA of securitization changes very little remaining significantly negative at 10% level; however, that on ROE is not significant. For the small banks, the coefficient on ROA is closer to that for the full sample but is not statistically significant; that on ROE remains negative and statistically significant. Further examination of the results reported in Table 3 reveals that most of the control variables included in the model are statistically significant and have the expected signs. One notable finding is the negative and significant impact of non-interest income ratio on profitability of big banks. In China, the big banks have the majority of market share and can take advantage of scale merit to earn sufficient interest margin. Therefore, the increase in non-interest income reduces profitability instead.

Table 3 Fixed effects regression results

	all banks		big banks		small banks	
	(1) ROA	(2) ROE	(3) ROA	(4) ROE	(5) ROA	(6) ROE
Sec	-0.0386*	-0.912***	-0.0461*	-0.357	-0.0370	-0.859**
NPLR	-0.0667	-0.779	-0.00239	-1.129	-0.0585	-0.631
LDR	-0.00268	-0.0723**	-0.00205	-0.00994	-0.00301	-0.0634
CIR	-0.0258***	-0.406***	-0.000526	-0.0930	-0.0326***	-0.481***
NIIR	-0.00169	-0.00360	-0.00816***	-0.168***	-0.00194	0.00516
LnTA	-0.344***	-5.854***	-0.159**	-2.108	-0.378***	-6.221***
EAR	0.0155	-1.387***	0.0171	-2.000***	0.00791	-1.372***
cons	11.32***	202.0***	5.926***	100.3**	12.23***	208.3***
N	477	476	124	123	353	353
R ²	0.5457	0.6280	0.6874	0.8040	0.5754	0.6173

* $p < .1$, ** $p < .05$, *** $p < .01$

5. Robustness Check

To further verify the aforementioned findings, robustness checks concerning estimation method and regressors lag are applied. Firstly, the model is re-estimated with pooled OLS regression. The pooled OLS regression results are reported in Table 4, where the layout is consistent with the Table 3 for ease of comparison. The results attained using pooled OLS do not differ from those obtained previously using fixed effects model. They coincide in terms of the sign of explanatory variables, and there is some gain of statistical significance. Secondly the model is re-estimated using one-period lagged regressors as alternative estimation technique, and it does not provide remarkably different results that are not reported here.

Table 4 Pooled OLS regression results

	all banks		big banks		small banks	
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ROE	ROA	ROE	ROA	ROE
Sec	-0.0889**	-1.548***	-0.131***	-1.631***	-0.0565	-1.087*
NPLR	-0.174**	-2.615**	-0.191***	-3.379***	-0.183**	-2.666**
LDR	-0.00124	-0.0407*	-0.000353	-0.00885	-0.00127	-0.0420
CIR	-0.0162***	-0.246***	-0.0148***	-0.271***	-0.0196***	-0.302***
NIIR	-0.00105	-0.0188	-0.00500**	-0.109***	-0.00155	-0.0214
LnTA	-0.0175*	-0.0794	0.0635***	1.205***	-0.114***	-1.557***
EAR	0.0726***	-0.983***	0.0942***	-1.302***	0.0487***	-1.198***
Cons	1.949***	40.46***	-0.469	7.576	4.733***	81.96***
N	477	476	124	123	353	353
R ²	0.3613	0.3922	0.6470	0.6232	0.3880	0.4315

* $p < .1$, ** $p < .05$, *** $p < .01$

6. Conclusion

Using a sample of 72 Chinese commercial banks between 2011 and 2017, this paper provides empirical evidence that loan securitization has a negative impact on bank profitability. The results are based on a variety of models, tests and checks. The use of several methods is to take account of autocorrelation and heteroskedasticity problems. The outcomes confirm that in China, even though loan securitization increases, it causes lower profitability of commercial banks.

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