

Interest rate risk management of commercial Banks under interest rate liberalization

Bie Yongjie

School of business, Nanjing Normal University

ABSTRACT: *With the deepening of China's financial reform, a large number of financial derivatives are born. The regulated interest rate in the past can no longer meet the development of the current financial market, so it must conform to the trend of interest rate liberalization. On October 23, 2015, the central bank announced to reduce the benchmark interest rate of deposits and loans and remove the upper limit of deposit interest rate of various financial institutions, which means that China has basically completed the interest rate liberalization reform that lasted for more than 30 years. As the interest rate is set by the state and decided by the supply and demand of the financial market, it brings some challenges to the regulation of interest rate risk and increases the interest rate risk of commercial Banks. This article combines our country commercial bank management present situation, the research background and the process of interest rate marketization, select the related data of 6 listed commercial Banks interest rate sensitive gap analysis, and in 2015-2017 Shanghai interbank interest rates to the VaR method, empirical analysis, research interest rate fluctuations and the impact of interest rate risk of commercial Banks, and puts forward reasonable improvement measures on test results.*

KEY WORDS: *interest rate liberalization; Interest rate risk; Commercial Banks; Risk management; Interest rate sensitivity gap; The VaR model*

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I. INTRODUCTION AND LITERATURE REVIEW

With the continuous development of the market economy and the emergence of various financial products, the government gradually released the control of interest rates on commercial Banks, and interest rate liberalization became the mainstream. In fact, China began to explore interest rate liberalization in 1978, but we often regard the liberalization of interbank offered rate in 1996 as the start of interest rate liberalization. In 2015, the central bank lowered the benchmark interest rate of deposits and loans of various financial institutions and lifted the limit on the upper limit of deposit interest rate of commercial Banks, which indicated the acceleration of China's financial reform and the basic completion of interest rate liberalization reform. Therefore, from the theoretical research and practical significance of these two aspects, in-depth discussion of commercial Banks interest rate risk management related issues of urgency. For a long time, the source of income of China's commercial Banks is largely dependent on the spread between deposit and loan. After the interest rate liberalization, the margin space becomes smaller and smaller. How to deal with such a change has become the main problem that commercial Banks need to solve. Due to the ever-changing economic environment at home and abroad and the endless financial innovations, China's interest rate risk management level is far less than that of developed countries, so it cannot flexibly deal with interest rate risk. Therefore, this article combined with the operations of commercial Banks, now after combing the development background and the process of interest rate liberalization, selecting 6 listed Banks as the research object, based on the overall level of the Shanghai interbank interest rates from the empirical analysis, analyzed the current problems in the process of interest rate risk prevention, and on how to further improve the level of interest rate risk management certain Suggestions is given.

The traditional interest rate risk measurement model is the interest rate sensitivity gap model. In 1983, J.P. Morgan & Co. submitted a report that, for the first time, grouped assets and liabilities by maturity, representing the interest rate-sensitive gap model that eventually emerged.

Manthos d.elis (2011) made VaR risk estimation on commercial Banks with various credit ratings, and concluded that French commercial Banks had fewer assets with interest rate sensitivity, so the interest rate risk was low, and the share of equity capital correspondingly increased, so the interest rate risk became lower. Xie Yunshan (2004) believes that with the deepening of interest rate liberalization, interest rate risk leads to credit risk, which further increases interest rate risk. Therefore, Banks should combine the two in risk management. Wei, L., & Tapsoba, S. J. A. (2014) pointed out that interest rate liberalization is a long-term task. Generally speaking, reform in developing countries is more risky. In China, interest rate risk is caused by the maturity mismatch between the assets and liabilities of commercial Banks. The magnitude of interest rate

fluctuation and the degree of maturity mismatch determine the magnitude of interest rate risk. Vanini, P., & Farinelli, S. (2008) adopted the method of stress test and proposed that commercial Banks should not only pay attention to interest rate risk management, but also reasonably set the asset-liability ratio. They could realize diversified operation of commercial Banks by strengthening the prediction of market interest rate and developing off-balance sheet business to deal with interest rate risk. Ding bo et al. (2013) believe that China's monetary policy authorities have brought opportunities for the development of financial management and inter-bank business of China's commercial Banks in a gradual manner in promoting the reform of interest rate liberalization. They have also summarized the experience of developed countries and expressed their opinions on the deficiencies in risk management. Wen xuejie (2014) pointed out that in the process of interest rate liberalization, in order to obtain development advantages, commercial Banks are facing increasingly intense competition, and the traditional deposit and loan business can no longer meet the needs of the industry, and the main profit method of deposit and loan spread will be strongly impacted. To this end, the comparison of a variety of interest rate risk, to find ways to deal with interest rate risk. Zhang ruiqi (2014) revealed through empirical analysis that under the current environment of interest rate liberalization in China, the key point of interest rate risk control is the rationality of interest rate spread, and he believed that if the risk of option is ignored too much, the real interest rate spread will be biased. Wang, B., & Sun, T. (2013) pointed out that "As interest rates are determined by market supply and demand, commercial banks, while having the pricing power of funds, are also subject to the frequent and ever-changing interest rates. They should strive to build a good macro financial environment and provide a platform for commercial banks to manage risk." Entrop, O., Memmel, C., Ruprecht, B., & Wilkens, M. (2015) use the interest rate sensitivity data of many listed banks to analyze the current situation of interest rate risk management of listed banks in the interest rate market environment by using interest rate sensitivity gap analysis method, and compared large state-owned commercial banks. The reasons for the differences are analyzed with the differences in the structure of assets and liabilities of joint-stock banks.

Currently, there are three main methods to measure interest rate risk of commercial Banks: IRSG Analysis, Duration gap Analysis and Var. After referring to the studies of many domestic scholars, this paper will conduct an empirical study on interest rate sensitivity gap and VaR model with a large amount of real-time data on the basis of previous studies, explore the impact of interest rate liberalization on interest rate risk management of commercial Banks and propose improvement measures.

II. THEORETICAL ANALYSIS OF INTEREST RATE RISK MANAGEMENT

1. Classification of interest rate risk

1.1 Fix the price risk

Repricing risk refers to the risk that the value of the interest-sensitive assets and liabilities of a commercial bank changes due to the difference in the repricing date.

1.2 Basis risk

Base risk refers to the risk arising from the inconsistency of the change degree of the benchmark interest rate of deposit and loan due to the adjustment of the benchmark interest rate.

1.3 Yield curve risk

Yield curve risk means that when the slope of yield curve changes, the yield rate of financial products with different maturity dates also changes, thus forming the risk of yield curve. Yield curves include up, flat and down.

Table 2-1 Types and characteristics of yield curves

Type	Characteristics
1.upward sloping	The longer the term, the higher the interest rate, the higher the long-term than the short-term
2.downward sloping	The longer the term, the lower the interest rate, the lower the long-term interest rate
3.flat type	The long rate is equal to the short rate

1.4 Optionality risk

Optionality risk, also known as option risk, refers to the risk of loss to the bank due to the customer exercising the option when the interest rate changes.

2. The process of interest rate liberalization in China

China's exploration of interest rate liberalization began in 1978, and it has experienced more than 30 years until 1996, when the country liberalized the interest rate of the interbank lending market, marking the real start of interest rate liberalization reform. "The basic reform ideas put forward by the people's bank of China are: First foreign currency, then local currency; First loan, then deposit; First long-term, large, after short-term, small.

- June 1, 1996, the people's bank of China liberalized the inter-bank offered rate, which was regarded as the breakthrough of interest rate liberalization.
- June 1997, interbank bond repurchase rate was liberalized.
- 1998 and 1999, the people's bank of China expanded the floating range of loan interest rates for financial institutions three times in a row.
- October 1999, the people's bank of China approved Chinese commercial Banks as legal persons to conduct trial operation of large-amount time deposit (minimum deposit amount of 30 million yuan, the term of which is more than 5 years, not including 5 years) with the interest rate determined by both parties through negotiation for Chinese insurance companies as legal persons, and made a preliminary attempt to reform the deposit interest rate.
- September 2000, the foreign currency loan interest rate and the large foreign currency deposit interest rate above 3 million us dollars (including 3 million us dollars) were liberalized.
- January 1, 2004, the people's bank of China again extended the floating range of loan interest rates for financial institutions.
- In October 2004, the loan ceiling was lifted. The fall was 0.9 times the base rate.
- August 2006, the band was extended to 0.85 times the base rate.
- June 2012, the central bank further expanded the floating range of interest rates. The upper limit of the floating range of the deposit interest rate shall be adjusted to 1.1 times of the benchmark interest rate; The lower limit of the floating range of the loan interest rate is 0.8 times of the benchmark interest rate. In July, it again set the lower end of the lending rate band at 0.7 times the base rate.
- July 2013, the reform of interest rate liberalization was further promoted, and since July 20, 2013, the control of interest rate on loans to financial institutions was fully liberalized.
- November 22, 2014, the upper limit of the floating range of deposit interest rate was adjusted from 1.1 times of the benchmark interest rate to 1.2 times.
- March 1, 2015, the upper limit of the floating range of deposit interest rate was adjusted from 1.2 times of the benchmark deposit interest rate to 1.3 times.
- October 24, 2015, the central bank decided to remove the floating ceiling of deposit interest rate from commercial Banks and rural cooperative financial institutions, and the interest rate liberalization reform was basically completed.

Source: compiled according to the website of the people's bank of China (<http://www.pbc.gov.cn>)

As can be seen from the above timeline, the reform of interest rate liberalization in China is a process from shallow to deep. In the early stage, it was smooth and slow, and kept groping. In the later stage, it gradually accelerated pace according to the needs of economic development, and basically completed the market-oriented reform of interest rate in 2015.

III. EMPIRICAL ANALYSIS ON THE COMMERCIAL BANK INTEREST RATE RISK MANAGEMENT

1. Interest rate sensitivity gap(IRSG)

The interest rate sensitive gap is simply the difference between interest rate sensitive assets and interest rate sensitive liabilities. According to different caliber, it can be divided into absolute index system and relative index system. "Commercial Banks refer to the assets and liabilities that mature in the short term as interest rate-sensitive assets and liabilities, and the difference between them is called interest rate-sensitive GAP", namely the absolute indicator system. Formula is:

$$GAP = IRSA - IRSL$$

The relative indicator system, namely the interest rate sensitivity coefficient (*ISRS*), can be used to compare and analyze the interest rate risk of many Banks. The formula is:

$$ISRS = \frac{IRSA}{IRSL}$$

Where, *IRSA* represents interest rate-sensitive asset, *IRSL* represents interest rate-sensitive liability, *GAP* represents interest rate-sensitive gap, *ISRS* represents the interest rate sensitivity coefficient.

Thus, the relationship between sensitivity gap, sensitivity coefficient and interest rate is expressed through the following table. ΔR is the change in interest rate, ΔNII is the change in net interest.

Table 3-1

GAP	ISRS	ΔR	ΔNII
Zero gap	=1	rising	Unchanged
Zero gap	=1	falling	Unchanged
Positive gap	>1	rising	increased
Positive gap	>1	falling	decreased

Negative gap	<1	rising	decreased
Negative gap	<1	falling	increased

Interest rate sensitive gap analysis is a simple and easy method, which is not only simple to calculate, but also easy to understand.

However, gap analysis also has some defects, mainly including: first, it is a static analysis process, reflecting the value of assets of commercial Banks in a period of time, ignoring the impact of time changes on the value. Second, gap analysis ignores option risk. In practice, customers are unlikely to stick to their contracts at all times and are likely to exercise their power to withdraw deposits or repay loans early.

Table 3-2 interest rate sensitivity gap of 6 commercial Banks at the end of 2012 (million yuan)

	3 months	3 months~1 year	1 ~5 years	5 years above
Agricultural bank of China	-1,563,127	1,445,530	-204,422	993,987
Industrial and commercial bank of China	-1,539,586	1,340,067	-48,908	1,174,159
China merchants bank	-332,810	365,204	15,897	111,238
Minsheng bank	486,506	-197,294	-147,883	8,437
Bank of nanjing	-86,613	85,361	41	22,961
Ningbo bank	-64,437	50,234	9,959	16,570

Source: financial reports of 6 commercial Banks in 2012

Table 3-3 interest rate sensitivity gap of six commercial Banks at the end of 2016 (million yuan)

	3 months	3 months~1 year	1 ~5 years	5 years above
Agricultural bank of China	392,162	1,797,791	595,675	1,991,228
Industrial and commercial bank of China	1,577,446	1,156,751	487,380	1,531,435
China merchants bank	487,261	565,286	292,117	719,538
Minsheng bank	926,492	395,208	168,682	82,692
Bank of nanjing	192,059	98,423	583	369,183
Ningbo bank	158,943	79,214	12,927	217,184

Source: financial reports of 6 commercial Banks in 2016

According to table 3-2 and table 3-3 data can be concluded that, in 2012, 6 listed Banks in China the gap of 3 months, in addition to the minsheng bank, the other five Banks are characterized by liabilities sensitivity gap, it can be seen that large state-owned commercial Banks of gap compared with other Banks, there is a big gap, more obvious. However, with the deepening of interest rate liberalization, in 2016, all the six Banks have a common asset sensitivity gap, indicating that the sensitive assets are more than the sensitive liabilities. When the interest rate rises, the income of commercial Banks will increase. Therefore, in today's interest rate liberalization, commercial Banks should pay attention to the interest rate change, improve their ability to predict the interest rate trend, prevent interest rate risk, and adjust the asset-liability strategy, so as to increase the income of the bank.

2. VaR model analysis

VaR refers to the maximum loss of financial assets caused by interest rate fluctuation in the normal market environment in the future. *VaR* is mathematically expressed as:

$$\Pr ob(\Delta P_t > VaR) = 1 - \alpha$$

Where, ΔP_t is the change in the value of the asset over time t, α indicating the confidence level.

If the value of financial assets obeys the normal distribution, We can use the formula $VaR = W_\mu Z_\alpha \varphi$ to estimate the value of *VaR*. Among them, W_μ is the initial value of assets, Z_α is the confidence interval under α , and φ is the conditional standard deviation.

Compared with general method, *VaR* model which is based on a large amount of historical data, with strong scientific nature. It reflects a probability value, can reflect the numerical wave in the future. At the same time, it can be used for horizontal comparison, measurement and analysis of market risks of different

departments, which is more suitable for the supervision of the regulatory departments on interest rates and diversification of interest rate risks.

Inevitably, *VaR* analysis method has many disadvantages. First, *VaR* analysis model shortcomings itself. As *VaR* analysis method includes many types and types, it may result in different results even though the same asset is used for testing. Second, the *VaR* analysis method has strict requirements on data, so it cannot accurately analyze the overlapping assets. Third, the *VaR* analysis method can only measure the risk in general market conditions, but it cannot measure the risk in special market conditions.

3. Empirical analysis of VaR based on ARCH family model

3.1 Introduction of the model

① ARCH model

q order autoregressive conditional heteroscedasticity *ARCH*(q) model, when $\varepsilon_t \sim ARCH(q)$, it can be expressed as the form of:

$$y_t = X_t' \beta + \varepsilon_t, \quad t = 1, 2, \dots, T \quad (3.1)$$

$$\varepsilon_t = \sigma_t \nu_t \quad (3.2)$$

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 = \alpha_0 + \alpha(B) \varepsilon_t^2 \quad (3.3)$$

Where $\alpha_0 > 0, \alpha_i \geq 0, i = 1, 2, \dots, q$ is a constant, and $\{\nu_t\}$ is independent and identically distributed by default when we study it, $E(\nu_t) = 0, D(\nu_t) = 1$. $\alpha(B)$ is a polynomial of lagged operator and $\alpha(B) = \alpha_1 B + \alpha_2 B^2 + \dots + \alpha_q B^q$, σ_t^2 is conditional variance. Equation (3.3) represents the variance of the error term x .

② GARCH model

The general form of the *GARCH*(p, q) model is

$$y_t = X_t' \beta + \varepsilon_t, \quad t = 1, 2, \dots, T \quad (3.4)$$

$$\varepsilon_t = \sigma_t \nu_t \quad (3.5)$$

$$\sigma_t^2 = \alpha_0 + \alpha(B) \varepsilon_t^2 + \beta(B) \sigma_t^2 = \alpha_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^p \beta_i \sigma_{t-i}^2 \quad (3.6)$$

Among them, $p \geq 0, q \leq 0, \alpha_0 > 0, \alpha_i \geq 0 (i = 1, 2, \dots, q), \beta_i \geq 0 (i = 1, 2, \dots, p)$. When $a=b$, $\varepsilon_t \sim ARCH(q)$, it can be found that *GARCH*(p, q) model and *ARCH*(q) model have many things in common, and *GARCH*(p, q) can also reflect the aggregation characteristics of interest rate fluctuations. In other words, after the big fluctuation of interest rate, there will be another big fluctuation. Similarly, after the small fluctuation, there will be another small fluctuation.

③ TARARCH model

$$r_t = \mu + \varepsilon_t \quad (3.7)$$

$$\sigma_t^2 = \alpha_0 + \alpha \varepsilon_{t-1}^2 + \gamma \varepsilon_{t-1}^2 d_{t-1} + \beta \sigma_{t-1}^2 = \alpha_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \gamma \varepsilon_{t-1}^2 d_{t-1} + \sum_{i=1}^p \beta_i \sigma_{t-i}^2 \quad (3.8)$$

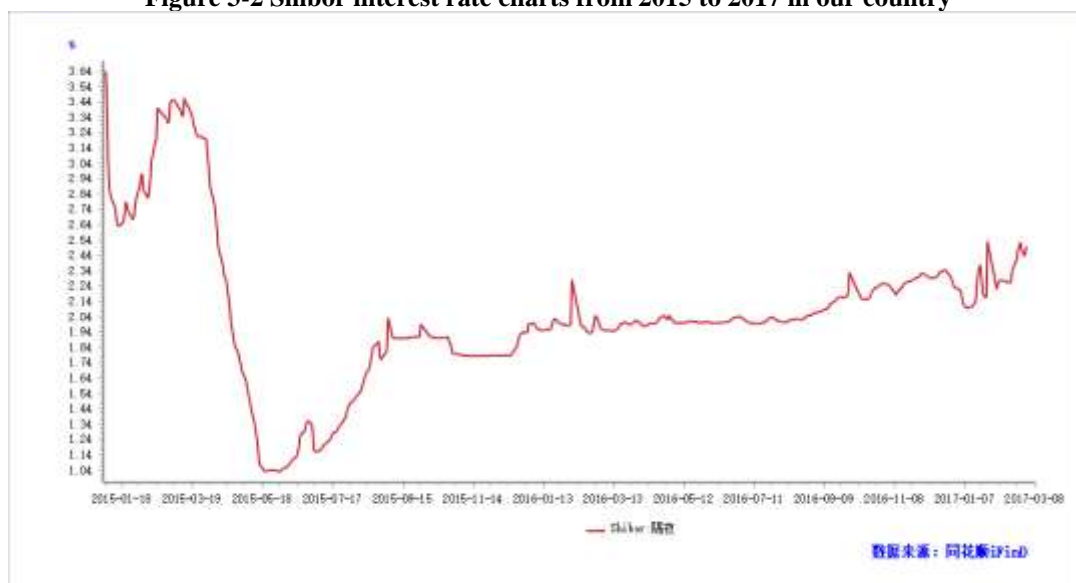
Where, (3.7) follows the generalized error distribution, Let's use μ for the constant term and ε_t for the error term. When $\varepsilon_t < 0, d_t = 1$; When $\varepsilon_t \geq 0, d_t = 0$.

3.2 Data selection

This paper selected the Shanghai interbank offered rate as the sample from January 1, 2015 to March 1, 2017, a total of 537 sample data. Shibor is the arithmetic average of bank quotes, and the calculation method and sample characteristics are suitable for research. In this paper, 95% and 99% confidence intervals are selected, and data analysis is conducted through Excel tables and Eviews software.

The following figure 3-2 shows the trend of Shibor overnight lending rate in China from 2015 to 2017. It can be found that the amplitude of fluctuation during this period is very irregular.

Figure 3-2 Shibor interest rate charts from 2015 to 2017 in our country



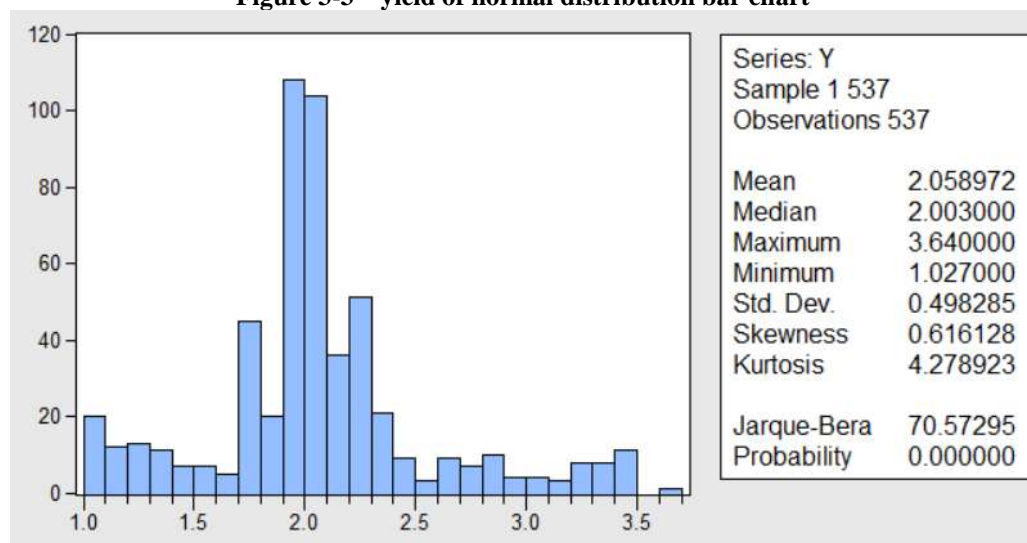
Source: flush iFinD

3.3 the sample test

①test of normality

We need to determine the distribution type of the sequence, and then determine the method to calculate VAR. The test results are shown in figure 3-3:

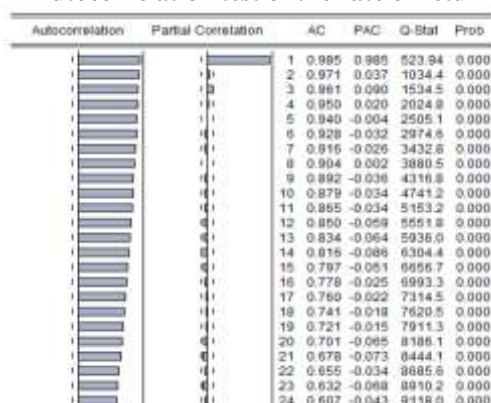
Figure 3-3 yield of normal distribution bar chart



According to the result of Eviews inspection can be found: sample average yield is 2.058972, the standard deviation is 0.498285,skewness is 0.616128, which is normally distributed.

②Autocorrelation test

Figure 3-4 Autocorrelation test of the rate of return sequence



As can be seen from the test results in figure 3-4, the rate of return of Shanghai interbank offered rate and its lagging autocorrelation function from order 1 to order 24 are both 0, which is less than 0.05, so there is an autocorrelation in the rate of return sequence.

③ Arch effect test

From the above autocorrelation test, it can be seen that the sequence itself has autocorrelation. In this case, the daily rate of return is expressed as follows:

$$r_t = \mu + \varepsilon_t$$

Where μ represents the constant term and ε_t represents the error term. We can now use the *LM* test to test whether there is a *ARCH* effect on the sequence $\{\varepsilon_t\}$.

Table 3-4 ARCH-LM test of yield residual

F statistic	2053.881	F statistic probability	0.0000
LM statistics	507.9711	Chi-square test probability	0.0000

Data sources: Eviews LM test results

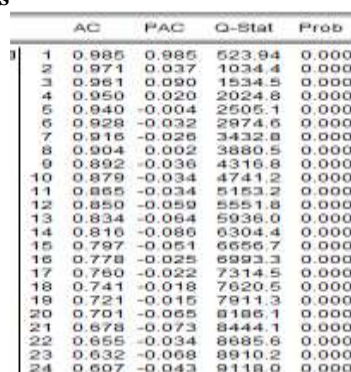


Figure 3-5 yields the square of the residual autocorrelation test figure

According to the test results in figure 3-5, LM statistic is 507.9711, with a probability of 0, which is less than the significance level $\alpha = 0.05$, and the null hypothesis is rejected. Moreover, the probability is 0 in the lag order from 1 to 24, so it can be considered that there is an autocorrelation in the square of column residuals, and that there is a high-order arch effect in $\{\varepsilon_t\}$.

④ Garch family model

a. Estimation results of *GARCH(1,1)* model

Table 3-5 GARCH(1,1) model test results

Variable	Coefficient	standard deviation	Z statistic	Prob
C	0.012431	0.005550	2.239905	0.0251
Y(-1)	0.995851	0.002647	376.1663	0.0000
Variance equation				
C	0.000188	2.25E-05	8.335639	0.0000
RESID(-1)^2	0.374600	0.084591	4.428370	0.0000

GARCH(-1)	0.623251	0.045108	13.81695	0.0000
R-squared	0.990014	Mean dependent var	2.056023	
Adjusted R-squared	0.989939	S.D.dependent var	0.494035	
S.E.of regression	0.049555	Akaike info criterion	-3.850435	
Sum of squared resid	1.303952	Schwarz criterion	-3.810471	
Loglikelihood	1036.917	Hannan-Quinn criter.	-3.834800	
F statistic	13160.84	DW statistics	1.688738	
Prob(F statistic)	0.000000			

Data sources: Eviews inspection results

Through analysis, we get: first, constant term C is 0.000188, indicating that the volatility of income level is still relatively high,so commercial Banks should always focus on interest rates.Second, α_1 represents the change coefficient of the rate of return under the action of external factors. When $\alpha_1 > 0$, the rate of return fluctuation is more sensitive to external factors.The empirical result $\alpha_1 = 0.374600$ indicates that the volatility of yield rate will be intensified due to the influence of external factors.Third, β_1 is a parameter to measure whether the volatility of the yield rate has long-term memory, while $\beta_1 = 0.623251$,so the volatility of yield has long-term memory.When $\alpha_1 + \beta_1 > 1$, the fluctuation of the sequence is continuous. If $\alpha_1 + \beta_1 = 0.997$ is less than 1, it means that the yield rate does not fluctuate significantly for a long time.

b. *TARCH*(1,1) estimation results

Table 3-6 *TARCH*(1,1) model test results

Variable	Coefficient	standard deviation	Z statistic	Prob
C	0.012380	0.006214	1.992173	0.0464
Y(-1)	0.995936	0.002978	334.4152	0.0000
Variance equation				
C	0.000183	2.52E-05	7.276004	0.0000
RESID(-1)^2	0.421735	0.099691	4.230418	0.0000
RESID(-1)^2*(RESID(-1)<0)	-0.095499	0.077602	-1.230622	0.2185
GARCH(-1)	0.630547	0.048381	13.03305	0.0000
R-squared	0.990006	Mean dependent var	2.056023	
Adjusted R-squared	0.989912	S.D.dependent var	0.494035	
S.E.of regression	0.049621	Akaike info criterion	-3.848327	
Sum of squared resid	1.304970	Schwarz criterion	-3.800371	
Loglikelihood	1037.352	Hannan-Quinn criter.	-3.829566	
F statistic	10500.56	DW statistics	1.687567	
Prob(F statistic)	0.000000			

Data sources: Eviews inspection results

According to the *TARCH*(1,1) test results, $r_t = \mu + \varepsilon_t \neq 0$ is obtained, the parameter coefficient is 0.000183, and the disturbance continuity is quite high.We determine that the volatility of the yield has a leverage effect on external shocks.

3.4 Numerical calculation

According to the formula $VaR = W_\mu Z_\alpha \phi$, can calculate the *VaR* values of dynamic valuation. But in general, when we study on the value at risk of commercial Banks,we can't get the exact value of the asset in each period, so we assume that the initial value is 1.In addition, due to the inherent characteristics of financial markets, *VaR* values are often underestimated in most cases due to the thick tail of time series.Therefore, we can select the conditional variance of the GARCH family model to replace the standard deviation for calculation. The value of *Z* is the value of the quantile of a normal distribution,and according to the table, the value of z is 1.96 at 95% confidence interval and 2.32 at 99% confidence interval.

Put the variance of GARCH and variance of *TARCH* into the formula to get the following table 3-7:

Table 3-7 The correlation estimation value of *VaR*

Model	confidence level	maximum	minimum	average
GARCH	95%	0.170002649	0.000984582	0.006180771
TARCH	95%	0.156461113	0.000980699	0.00614832
GARCH	99%	0.201227626	0.001165424	0.007316015
TARCH	99%	0.18519887	0.00116083	0.0072776

3.5 result analysis

Shibor is selected for empirical analysis, which has good representativeness and persuasiveness. Through the analysis of *VAR* by *ARCH* family model, we believe that the Shibor return rate sequence is normally distributed with conditional heteroscedasticity, and the Shibor index is highly volatile and responsive to external factors, but not for long. Therefore, it can be considered that the frequent changes of interest rates often have a greater interest rate risk, which will also increase the difficulty of management, which will be a big challenge for commercial Banks.

IV. THE MAIN PROBLEM OF INTEREST RATE RISK MANAGEMENT IN CHINA'S COMMERCIAL BANKS

1. Ignore interest rate risk management

Due to the slow twists and turns in the interest rate marketization reform, the interest rate risk of commercial banks is not fully exposed in daily operation and management. In this way, the relevant personnel will ignore the interest rate risk from the concept. Moreover, most of the senior managers focus on other risks, and let the relevant work of interest rate risk management be allowed. Basically completed, interest rate risk is gradually exposed in the current economic system. Therefore, it is extremely urgent to fundamentally change the concept of risk management.

2. Single commercial bank asset and liability structure

The asset and liability structure of China's commercial banks is relatively simple, which increases the interest rate risk faced by China's commercial banks. We know that for a long time, the main source of income of China's commercial banks relied mostly on the spread of deposits and loans. However, in today's interest rate marketization, if commercial banks are still obedient, they do not know how to adjust their business models in a timely manner and develop flexible and volatile middle. Business, proactively adjust the proportion of assets and liabilities in all business activities, interest rate risk will expose the operating crisis. Therefore, when interest rates fluctuate frequently, if commercial banks are unable to adjust the ratio of assets and liabilities in a timely and effective manner, the ability to deal with interest rate risks will inevitably be hindered.

3. Insufficient application of financial derivatives

China's financial derivatives market started late, its innovation ability is insufficient, and the variety of derivatives is relatively simple. For our banks, we usually do not make full use of the options futures tools. Take Minsheng Bank as an example. Table 3-8 shows the situation of derivative financial instruments held by Minsheng Bank in 2015-2016. As can be seen from the data in the table, interest rate swap contracts account for the smallest proportion, and various financial derivatives are not well-balanced. The side can also reflect that most small and medium-sized banks, such as Minsheng Bank, do not make good use of financial derivatives. Diversify interest rate risk. Today, the interest rate liberalization reform has just been basically completed. The specific operation of derivatives is not very mature. To fully utilize financial derivatives to hedge interest rate risks, commercial banks need to constantly explore.

Table 3-8 Status of Financial Derivatives held by Minsheng Bank

Year Categories	Asset		Liability	
	2016	2015	2016	2015
Currency swap contract	4350	3235	7045	2657
Interest rate swap contract	104	456	114	447
Foreign exchange forward contract	354	98	968	33
Currency option contract	171	112	145	64
Total	4979	3901	8272	3201

Source: According to the 2016 annual financial report of Minsheng Bank

4. Lack of a sound interest rate risk management system

In China, most commercial banks have not yet established a specific risk management department, and many of them manage the interest rate risk in other departments. Moreover, for a long time, China's commercial banks have carried out their work in accordance with the hierarchical charter. There is often no good implementation between the head office, branches, departments and outlets. For some resources and responsibilities are not used reasonably, such a structure is very likely to lead to a specific staff and actual positions do not match, the relevant personnel will grasp the loopholes, take the initiative to shirk responsibility. Therefore, we must establish and improve our risk management system.

5. Lack of professional interest rate risk management talents

Relatively speaking, the work of interest rate risk management requires a high degree of professional matching. Specifically, the staff must have a financial thinking, always pay attention to financial hotspots, and be familiar with the domestic and international market environment. When a certain indicator of the financial market changes. It is necessary to be able to respond in a timely manner and give countermeasures. In addition, it is necessary to learn effective and effective ways to resolve risks, and use various financial derivatives to reduce or avoid interest rate risks. Only in this way can we deal with the rapid and powerful impact of interest rate marketization. However, at present, the cultivation of relevant talents in China is still in its infancy, and there are very few high-level professionals. This has hindered the further implementation of many tasks to a certain extent.

V. IMPROVEMENT MEASURES FOR INTEREST RATE RISK MANAGEMENT OF CHINA'S COMMERCIAL BANKS

1. Attach importance to interest rate risk management

With the basic completion of interest rate liberalization reform, the importance of interest rate risk management has become a common consensus in the banking industry. First of all, commercial banks should enhance their awareness of risks, pay attention to them from the concept, and pay attention to market information at all times. When conditions permit, seminars on improving management systems can be held regularly to discuss possible interest rate risks. Secondly, while conducting research, we should also combine the actual operating conditions of the Bank, exert our innovative spirit, and take the best of it, and seek ways to comply with the Bank. In addition, commercial banks can also use regular in-house testing, departmental publicity, and outdoor practice to enhance employees' awareness of interest rate risk management, increase employee interaction, and increase participation awareness and initiative.

2. Strengthening self-construction and building a management system for risk internal control of commercial banks

2.1 Gradually improve the risk internal control mechanism and establish an interest rate risk management department

China's commercial banks need to build a good risk management system. First of all, the relevant departments must implement the rules and regulations of the risk management work, and the work must be carried out in accordance with the rules and regulations. Second, establish an early warning mechanism for interest rate risk, and staff should collect data in a timely manner and summarize it. Finally, test and analyze the data, summarize the cause and effect of the problem, and give the solution according to the actual situation. Most commercial banks in China have not set up interest rate risk management departments separately. Risk management related work often intersects with other departments. This can easily lead to confusion in job responsibilities and management of long positions, which in turn makes risk management too decentralized. Therefore, it is necessary to set up the interest rate risk management department according to the actual operating conditions of the Bank.

2.2 Adjust the business structure and strive to develop intermediate business

For a long time, the general deposit and loan business has dominated the business transactions of commercial banks in China, while the emerging intermediary business accounted for a relatively low proportion. With the advent of interest rate liberalization, interest rate volatility has become more and more close, and it is no longer possible to maintain the development of commercial banks by relying on spread income alone. Therefore, banks should make necessary adjustments to the existing business structure, transfer some of the investment that was mainly concentrated on interest income to the intermediary business, support the development of intermediary business, and actively promote financial management, guarantee, financing, and financial derivatives. Transforming areas such as transactions, increasing income, and satisfying customers' diversified needs.

In addition, while continuing to strengthen the promotion of traditional intermediary business, we must also actively explore emerging intermediary businesses to inject new vitality into the market, such as Internet finance, and promote the Internet + development model. This requires all commercial banks to promote the intelligent services of outlets, and promote the construction, development and use of big data platforms with intelligent equipment such as super service counters and self-service terminals. It is also possible to grasp customer needs and risk preferences through data analysis, promote personalized product development and precision marketing, and adapt to the trend of transaction networking. Making Internet finance an important springboard for commercial banks to achieve breakthrough development in the moment, reducing the impact of interest rate risk.

2.3 Emphasis on relevant personnel training and build a professional team

The interest rate risk management work requires extremely high professionalism for the staff. This requires not only a keen observation of the market environment, but also a meticulous analysis capability, always paying attention to the direction of the economic situation, and promptly responding, flexible use appropriate Risk management tools reduce risk and achieve bank business objectives. Therefore, we must pay attention to the absorption and cultivation of risk management talents. However, the cultivation of talents has a certain periodicity. The existing training mechanism is unlikely to break through in the short term. We need to establish a scientific and rational long-term training mechanism. In addition to recruiting talents with expertise in interest rate risk management during recruitment, an internal competition mechanism can be implemented to regularly perform performance appraisal on professional knowledge and operations; external experts and scholars can be used for communication and guidance; and long-term cooperation with financial institutions. Establish a talent training base; provide excellent employees with opportunities to study abroad.

3. Creating a good macro financial environment

Interest rate changes are closely related to the macro financial environment. A good macro environment is conducive to the development and improvement of interest rate risk management.

3.1 Strengthen and improve China's financial market

China's financial market started late and the foundation was thin, and its operation process was not standardized. In order to further improve China's financial market, the government should start from two aspects: the money market and the financial derivatives market. First, improve China's currency market, and constantly enrich the trading varieties, in order to achieve rational allocation of resources, reflecting the purpose of capital supply and demand; at the same time, we must improve the bond market and play its financing and regulation role. Second, strengthen innovation, vigorously develop the derivatives market, especially the options futures market, enrich the variety of derivatives, give full play to the leverage and risk transfer functions of financial derivatives, and transfer interest rate risks.

3.2 Improve financial regulations in a timely manner

A good interest rate risk management environment is the result of joint efforts of all parties, which is inseparable from the legal supervision and support provided by the legislature. If we want better economic development, we should do our utmost to maintain the vitality and stability of the financial market, establish a well-organized market order, and never let the financial market become chaotic. The advent of interest rate liberalization puts new demands on the work of the legislature, and the legal system must also keep pace with the times, so that the occurrence of financial business can be based on laws and regulations, and the use of sound laws and regulations to regulate economic behavior.

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