ISSN 2616-5902 Vol. 6, Issue 2: 192-200, DOI: 10.25236/AJBM.2024.060228

Research on the Impact of LPR Reform on Shanghai Bank's Asset Business

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Abstract: *In August 2019, in order to break the barrier of the "dual interest rate system" for the transmission of market interest rates to the real economy, the People's Bank of China launched the Loan Prime Rate 2.0 version, known as the LPR reform, to promote the marketization of interest rates, smooth the transmission of interest rates, and transmit the loose effects of monetary policy smoothly to the loan side. This has completely changed the determination method of commercial bank loan interest rates, bringing new opportunities and challenges to the operation and management of China's commercial banks. As a listed joint-stock commercial bank that takes the lead in achieving cross-regional development in the urban commercial banking system, it is particularly important to study the impact of LPR on Shanghai Bank, and it can also provide opinions for commercial banks to deal with the hidden risks under the LPR reform. Through theoretical and empirical research analysis, it is found that although the loan scale of Shanghai Bank is expanding year by year, the negative impact of subsequent LPR reform may become increasingly significant. The net interest margin of Shanghai Bank may show a trend of first decreasing and then increasing, and the bank's profitability will experience a decline stage, which is not conducive to the sustainable development of Shanghai Bank. In order to enable Shanghai Bank to calmly respond to risks and seek new development opportunities in the LPR reform, this article proposes the following suggestions: internally, it is recommended that Shanghai Bank accelerate its business transformation, optimize its debt structure, improve its pricing mechanism, and transform its internal management model; externally, it is recommended that Shanghai Bank optimize customer management and strengthen risk prevention.*

Keywords: *LPR Reform, Interest Rate Liberalization, Shanghai Bank, Asset Business*

1. Definition of Basic Concepts

1.1 LPR

LPR (Loan Prime Rate) is a benchmark loan interest rate implemented by the People's Bank of China (PBoC) since October 25, 2013. This centralized quotation issuance mechanism involves 18 representative banks reporting their respective interest rates for the most creditworthy customers, plus an integer multiple of 0.05%. The PBoC then authorizes the National Interbank Funding Center to publish the calculated benchmark loan interest rate. The LPR is released every month on the 20th (postponed if it falls on a holiday) at 9:30 AM, and the public can access it through the websites of the PBoC and national banks. The current LPR is divided into two types: one-year and over five-year terms.

Based on the LPR, commercial banks determine their loan interest rates using the formula "LPR + n basis points" or "LPR - n basis points." The interest rates for one-year or five-year loans are directly determined by the corresponding LPR value. There are two methods for pricing loan interest rates in commercial banks: fixed interest rates and floating interest rates. Fixed interest rates remain unchanged during the contract period and are determined by adding or subtracting basis points from the LPR at a specific time or during a specified period stipulated in the contract. Once the interest rate is set, it cannot be changed before the loan matures. Floating interest rates, on the other hand, are adjusted by adding or subtracting basis points within the agreed contract period based on changes in the LPR, which serves as the benchmark loan interest rate.

1.2 LPR Reform

LPR reform refers to the Loan Prime Rate, with the English name remaining unchanged. In August 2019, the PBoC issued a notice requiring the reform and improvement of the formation mechanism for

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the loan market quotation interest rate, introducing six aspects of reform to the LPR (shown in Figure 1).

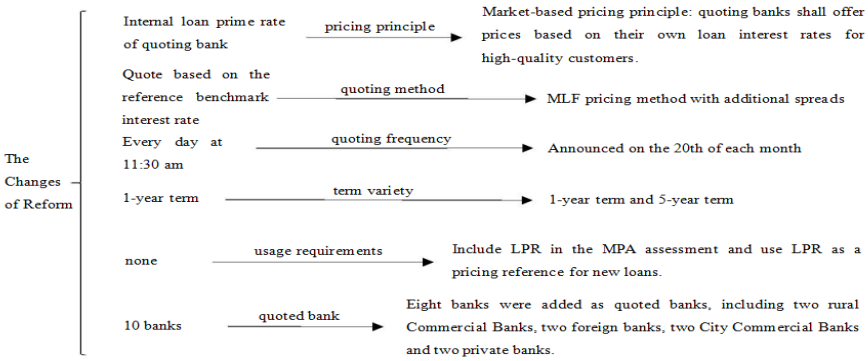

Figure 1: Comparison before and after the reform of LPR

1.3 Asset Business of Commercial Banks

Asset business refers to a bank's credit business, where it utilizes its own funds for operations. In the West, based on the method of fund utilization, a bank's asset business is divided into investments and loans. When categorized by the collateral method of assets, it can be further divided into bill business (discounting and pledging) and securities business (pledging with marketable securities). In China, the asset business of commercial banks is primarily loans, which account for the largest proportion. Credit business is based on credit, with loans being issued at specific interest rates and maturities.

2. Mechanism Analysis of the Impact of LPR Reform on the Asset Business of Shanghai Bank

The new loan pricing mechanism, LPR (Loan Prime Rate), has directly transformed the pricing method of bank loan interest rates from the benchmark lending rate to LPR, which has a significant and direct impact on the bank's loan business.

2.1 LPR Reform can Expand the Scale of Bank Loans

In the short term, after the interest rate is unified, in order to reduce the financing costs of small and medium-sized enterprises, the central bank may continue to guide the benchmark lending rate downward. At this time, Shanghai Bank will refer to the LPR to lower its loan interest rates. Lower loan interest rates will stimulate people's credit demand, thereby expanding the scale of bank loans.

When combined with the financial statements of Shanghai Bank over the past decade, it is evident that the loan scale has indeed been growing year by year.

2.2 LPR Reform can Reduce the Profitability of Banks

In the medium term, the downward adjustment of the benchmark interest rate has led to a price war among banks. To compete for customer resources, city commercial banks like Shanghai Bank need to offer lower loan interest rates and higher deposit interest rates compared to large state-owned banks, sacrificing larger profit margins. The banking industry tends to favor medium- and long-term credit business, thereby extending the maturity structure of the entire credit business, which increases the risk of mismatch in the bank's maturities. Banks tend to lend to customers who are insensitive to interest rates while tightening their lending to customers who are sensitive to interest rates. Banks will seek higher risk premiums and less risk bargaining power, thus increasing their risk appetite.

If the deposit side remains unchanged or even rises, and the loan side declines, this may lead to a decrease in the bank's credit interest rates and an intensification of the narrowing of the deposit-loan interest margin [1]. Moreover, a decline in bank profits may also lead to a decline in creditworthiness. When the deposit interest rate is marketized, the debt cost of the entire bank will rise, and some banks may have to raise loan interest rates, which will be a relatively difficult period for banks.

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Secondly, the continuous downward trend of LPR will also increase interest rate risk. Market interest rates fluctuate constantly, and the increasing interest rate risk will be an inevitable path in the process of interest rate liberalization. Interest rate pricing becomes more difficult to predict, leading to banks facing more and greater risks, which will increase the difficulty of bank management and lead to increased management costs. When the loan ratio continues to rise, if the source of funds is not sufficient, there will be excessive reliance on short-term savings. When the market currency tightens and short-term interest rates rise, banks will do everything possible to absorb more deposits, which will lead to significant cost expenditures.

Observing the changes in the growth rate of Shanghai Bank's loan scale over the past decade, it can be seen that at the two time points of 2013 (when LPR was implemented) and 2019 (when LPR reform was carried out), the growth rate of the loan scale has decreased. This confirms the mentioned earlier that after the decision-making power over interest rates is delegated to the market, competition in the banking industry has intensified.

Based on the above theoretical mechanism, the implementation of interest rate liberalization has led to a decrease in the benchmark loan interest rate, which in turn has affected the loan pricing of the entire banking system. Since the deposit side has not changed, banks will encounter greater risks than before. This article predicts that the LPR reform will have a negative impact on the asset business of Shanghai Bank.

3. Quantitative Analysis of the Impact of LPR Reform on the Asset Business of Shanghai Bank

3.1 Data Sources and Variable Selection

3.1.1 Data Sources

For empirical analysis of relevant data from 2011 to 2020, we selected data on railway freight volume and medium- and long-term loans published in the Chinese Statistical Application Support System, closing prices of the Shanghai Composite Index from the CSMAR Database, GDP and CPI of the real estate industry from the National Bureau of Statistics' National Statistical Yearbook, industrial electricity consumption from the official website of the National Energy Administration, as well as loan-related data regularly disclosed in the annual reports of the People's Bank of China and the official website of Shanghai Bank.

3.1.2 Variable Selection

(1) Selection of Explained Variables

The explained variable chosen is the natural logarithm of the bank's loan and advance scale.

(2) Selection of Explanatory Variables

Drawing upon the selection criteria of scholars Zhang Yuan and Xue Qingmei (2016) [2], this paper chooses the synthetic interest rate liberalization index (IRM) as the explanatory variable to represent the level of interest rate liberalization and quantifies the LPR reform in a numerical form.

Measurement Construction of the Interest Rate Liberalization Index:

① Actual Interest Rate Level Index

This paper selects the one-year fixed deposit interest rate (representative of the nominal interest rate) minus the inflation rate as the benchmark method. To scientifically and reasonably quantify and compare China's actual interest rate level, a fuzzy comprehensive evaluation method is adopted to establish a membership function, which is then evaluated. The calculation results can be used to assess the actual interest rate level, with values ranging from 0 to 1, and the specific indicator function is given as follows:

$$\mathrm{AR_t} = \mathrm{NIR_t} - \mathrm{IR_t} \tag{1}$$

$$IRM_{1t} = \frac{AR - AR_{min}}{AR_{max} - AR_{min}} \tag{2}$$

$\mathrm{AR_t}$ represents the actual interest rate in the t_{th} year, $\mathrm{NIR_t}$ is the nominal interest rate in the t_{th} year represented by the one-year fixed deposit interest rate, and $\mathrm{IR_t}$ is the inflation rate in the t_{th} year represented by the consumer price index. IRM_{1t} represents the actual interest rate level in the t_{th}

ISSN 2616-5902 Vol. 6, Issue 2: 192-200, DOI: 10.25236/AJBM.2024.060228

year, AR_{max} represents the maximum actual interest rate level during the period from 1 to t, AR_{min} represents the minimum actual interest rate level during the period from 1 to t, and $AR_{max} - AR_{min}$ represents the range of actual interest rates. The higher the actual interest rate level, the higher the degree of interest rate liberalization in that year.

② Measurement of Interest Rate Fluctuation Range Index

The bond market, money market, and deposit and loan market are the three major battlefields of China's interest rate liberalization, playing a pivotal role in both macro and microeconomics. Among them, the bond market includes three sub-markets, the money market includes four sub-markets, and the deposit and loan section of financial institutions includes four sub-markets. Therefore, drawing upon scientific methods and weight assignments from previous studies, this paper uses the upper and lower limits of interest rate fluctuations in these markets as an important reference for constructing the interest rate fluctuation range index.

A natural index function is established to fit the interest rate fluctuation range indicators of each sub-market, and the calculation model is as follows:

$$M_{it} = \frac{1}{2}\left(e^{-\frac{1}{up_{it}-lim_{it}}} + e^{-\frac{1}{down_{it}-lim_{it}}}\right) \tag{3}$$

$$IRM_{2t} = \sum_{i=1}^{11} M_{it} w_{it} \tag{4}$$

In this context, M_i represents the i_{th} sub-market, M_{it} represents the interest rate fluctuation range index of the i_{th} sub-market M_i in the t_{th} year, $up_{it} - lim_{it}$ represents the upper limit of interest rate fluctuations in the i_{th} sub-market M_i in the t_{th} year, $down_{it} - lim_{it}$ represents the lower limit of interest rate fluctuations in the i_{th} sub-market M_i in the t_{th} year, IRM_{2t} represents the interest rate fluctuation range index in the t_{th} year, and w_i represents the weight of the i_{th} sub-market M_i in the entire deposit and loan system of financial institutions.

Table 1: The weights of various submarkets in the financial market

	bond market			money market				deposits and loans of financial institutions				Total
category	long-term government bonds	financial bonds	corporate bonds	short-term government bonds	bond repurchase	bill discounting	interbank lending	RMB deposits	RMB loans	foreign currency deposits	foreign currency loans	
Submarket(M_i)	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}	
initial value assignment	1	1	1	1	1	1	1	3	3	1	1	15
Weight(w_i)	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{15}$	$\frac{1}{15}$	1

After determining the weights of each sub-market, as shown in Table 1, the interest rate fluctuation range index is calculated.

③ Synthesis of the Interest Rate Liberalization Index

The determination of the interest rate liberalization index depends on both the actual interest rate and the interest rate fluctuation range. These two indicators reflect different aspects of the degree of interest rate liberalization. To maximize the information contained in the indicators, we select a simple averaging method to combine them, resulting in a comprehensive interest rate liberalization index with an annual value ranging from 0 to 1.

By simply averaging the two indicators mentioned above, we obtain the interest rate liberalization index (IRM_t). The specific formula for its calculation is as follows:

$$IRM_t = \frac{1}{2}\sum_{n=1}^{2} IRM_{nt} \tag{5}$$

In this formula, IRM_t represents the comprehensive interest rate liberalization index in the t_{th} year, and IRM_{nt} represents the n_{th} sub-indicator used in synthesizing the interest rate liberalization index. The simple averaging method has a wide range of applications, indicating that the two indicators play an equal role in the interest rate liberalization index. During the reform process, it is important to ensure coordination between the two indicators, as their fine combination is superior to relying on a single indicator alone.

(3) Selection of Control Variables

The three major businesses of commercial banks are influenced by various factors at the macroeconomic, industry, and internal levels. Based on this, the model selects the "Li Keqiang Index"

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(LKQ) to study its impact on the macroeconomic level. In our model, IEC represents industrial electricity consumption, BL represents medium and long-term loan balances, and VRF represents railway freight volume.After obtaining these data, the Li Keqiang Index is calculated using the formula (LKQ = 40%×ΔIEC + 35%×ΔBL + 25% ×ΔVRF).

The deposit and loan business of banks is greatly influenced by monetary policy, which has an impact on money liquidity and thus causes fluctuations in bank deposits. Therefore, the growth rate of broad money supply (ΔM2) is selected as an indicator to measure the elasticity of monetary policy.

At the industry level, the real estate market, stock market, and Internet financial market all have a significant impact on the deposit sources of commercial banks. Therefore, the model selects industry control variables from these three levels.

Regarding real estate prices, scholars (Duan Zhongdong, Zeng Linghua, Huang Zexian, 2007) [3] mainly use the average housing price in the real estate industry as a metric. However, considering the high correlation between it and the explanatory variables, in order to avoid multicollinearity in the empirical analysis of the model, the actual annual GDP growth rate of the real estate industry (RE) is selected as an alternative.

Regarding stock market prices, referring to the selection criteria of (Gui Hefa, Zou Pengfei, Yan Wu, 2008) [4], the annual average of the Shanghai Composite Index (SC index) is selected as the variable for stock prices. To facilitate empirical analysis, a logarithmic transformation is performed.

Regarding the various business models of Internet finance, such as third-party payment and online lending, there is currently no unified statistical system to measure them. Scholars (Zhan Minghua, Zhang Chengrui, Shen Juan, 2018) [5] typically use the growth rate of the total scale of third-party payment (IF) as a variable to measure the development level of Internet finance.

At the level of the bank itself, the non-performing loan ratio (NPL) can affect the bank's ability to attract deposits. Secondly, the capital adequacy ratio (CAR) can indicate the strength of a bank's ability to resist risks. Moreover, selecting the result of the logarithmic transformation of deposit size (LND) can effectively control its scale, as bank deposits are its main financing channel.

This article involves a total of eight control variables, as shown in Table 2.

Table 2: Control variables of the model

Symbol representation	Variable meaning
LKQ	"Keqiang Index", an indicator reflecting the volume of economic growth
ΔM2	Broad Money Supply Growth Rate
RE	Year-on-Year Growth Rate of Real GDP in the Real Estate Industry
SC index	Natural logarithm of the annual average closing price of the Shanghai Stock Exchange Composite Index
IF	Growth rate of the total scale of third-party payment
LND	Logarithmic processing of bank deposit scale
CAR	Capital Adequacy Ratio (CAR)
NPL	Non-performing Loan Ratio of Banks

3.2 Descriptive Statistics and Correlation Analysis of Variables

3.2.1 Descriptive Statistics of Variables

The descriptive statistics of variables is shown in Table 3.

Table 3: Descriptive statistics results of variables

	Number of cases	Minimum value	Maximum value	Average value	Standard deviation
LOAN	10	19.5995	20.7647	20.147740	0.3856150
IRM	10	0.3707	0.9360	0.738520	0.1670379
IF	10	0.0793	2.2656	0.836430	0.6294498
RE	10	0.0583	0.1909	0.123910	0.0420582
LKQ	10	0.0227	0.0960	0.063200	0.0184880
SC index	10	7.6924	8.2219	7.932990	0.1798147
ΔM2	10	0.0810	0.1380	0.112800	0.0236446
NPL	10	0.0082	0.0122	0.010650	0.0014819
LND	10	19.9613	20.9977	20.509930	0.3358688
CAR	10	0.1143	0.1433	0.128960	0.0083929
Effective number of cases (in columns)	10				

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3.2.2 Correlation Analysis of Variables

Before conducting regression analysis, it is necessary to first perform a correlation analysis on the data to understand the strength of the relationship between the variables.In this paper, a correlation analysis is conducted on eight variables, including the year-on-year growth rate of real GDP in the real estate industry (RE), the growth rate of broad money supply (ΔM2), the growth rate of bank loans (LOAN), the non-performing loan ratio (NPL), the "Li Keqiang Index" (LKQ), the interest rate marketization index (IRM), the growth rate of the total scale of third-party payment (IF), the scale of bank deposits (LND), the capital adequacy ratio (CAR), and the natural logarithm of the annual average closing price of the Shanghai Composite Index (SC index). The results obtained are shown in Table 4 and Table 5.

Table 4: Correlation analysis of variables

	RE	ΔM2	LOAN	NPL	LKQ
RE	1				
ΔM2	0.221	1			
LOAN	-0.577	-0.817**	1		
NPL	-0.194	-0.664*	0.729*	1	
LKQ	0.139	-0.604	0.330	0.077	1
IRM	-0.307	0.086	-0.056	-0.166	-0.403
IF	0.661*	0.302	-0.565	-0.081	-0.071
SC index	0.015	-0.462	0.506	0.901**	-0.125
LND	-0.550	-0.816**	0.982**	0.790**	0.243
CAR	-0.312	-0.728*	0.567	0.479	0.219

Table 5: Correlation analysis of variables (continued)

	RE	ΔM2	LOAN	NPL	LKQ
RE					
ΔM2					
LOAN					
NPL					
LKQ					
IRM	1				
IF	0.052	1			
SC index	-0.151	-0.079	1		
LND	0.049	-0.441	0.564	1	
CAR	0.251	-0.172	0.382	0.619	1

Note: * and ** indicate significant correlations at the 0.05 level (two-tailed) and 0.01 level (two-tailed), respectively.

Based on the correlation coefficients among the variables in the table, the correlation between the independent variables and other variables is not very significant, and the correlation coefficients are at a relatively low level. Additionally, the correlation coefficients among most of the control variables are also at a low level. Therefore, the likelihood of the existence of multicollinearity is relatively small.

3.2.3 Model Application

The research topic of this paper is the impact of LPR reform on the asset business of Shanghai Banking Corporation. The research approach is as follows: Firstly, based on the methods used in previous literature, we calculate the synthetic interest rate marketization index, which serves as a specific quantitative indicator for LPR reform. Then, we use the model to study the specific impact of interest rate marketization level on the loan scale of Shanghai Banking Corporation.

Based on the above research approach and brief analysis, this paper performs regression on the model, which is set as follows:

$$y = \beta x + \mu \tag{6}$$

Combining the research topic of this paper and the corresponding control variables, the final established research model is as follows:

$$LOAN_i = \beta_1 IRM_i + \beta_2 LKQ_i + \beta_3 \Delta M2_i + \beta_4 RE_i + \beta_5 IF_i + \beta_6 SCindex_i + \beta_7 LND_i + \mu_i \tag{7}$$

In this model, LOAN represents the growth rate of loans at Shanghai Banking Corporation, IRM represents the interest rate marketization index, LKQ represents the "Li Keqiang Index", ΔM2 represents the growth rate of broad money supply, RE represents the year-on-year growth rate of real estate industry's GDP, IF represents the growth rate of the total scale of third-party payment, SC index represents the annual average closing price of the Shanghai Composite Index, and LND represents the scale of bank deposits.

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3.2.4 Empirical Analysis

Table 6: Regression results of Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRM	-0.129647	0.005398	-24.01826	0.0017
ΔM2	1.410510	0.082697	17.05642	0.0034
IF	-0.098536	0.001535	-64.18516	0.0002
RE	0.061316	0.032708	1.874667	0.2017
LKQ	2.346064	0.078381	29.93169	0.0011
LND	1.105367	0.005740	192.5640	0.0000
SC index	-0.007975	0.007041	-1.132654	0.3749
C	-2.596811	0.119936	-21.65172	0.0021
R-squared	0.999994	Mean dependent var		20.14774
Adjusted R-squared	0.999974	S.D. dependent var		0.385615
S.E. of regression	0.001979	Akaike info criterion		-9.621515
Sum squared resid	7.84E-06	Schwarz criterion		-9.379447
Log likelihood	56.10758	Hannan-Quinn criter.		-9.887063
F-statistic	48797.35	Durbin-Watson stat		2.368846
Prob(F-statistic)	0.000020			

In the regression results, as shown in Table 6, the signs and values of the regression coefficients are consistent with the conclusions derived in the previous sections and align with the research hypotheses. The R-squared value is 0.99999, indicating a high degree of model fit.

3.2.5 Robustness Test

By replacing two of the control variables, the following regression results were obtained:

$$LOAN_i = \beta_1 IRM_i + \beta_2 LKQ_i + \beta_3 NPL_i + \beta_4 RE_i + \beta_5 CAR_i + \beta_6 SCindex_i + \beta_7 LND_i + \mu_i \quad (8)$$

Table 7: Regression results of Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRM	-0.261872	0.044549	-5.878306	0.0277
NPL	-107.7093	14.41058	-7.474323	0.0174
CAR	-2.542391	0.921728	-2.758286	0.1101
RE	-1.265532	0.216753	-5.838576	0.0281
LKQ	2.532476	0.482058	5.253469	0.0344
LND	1.238028	0.045458	27.23439	0.0013
SC index	0.627040	0.098341	6.376200	0.0237
C	-8.553305	1.121186	-7.628802	0.0168
R-squared	0.999609	Mean dependent var		20.14774
Adjusted R-squared	0.998240	S.D. dependent var		0.385615
S.E. of regression	0.016178	Akaike info criterion		-5.419779
Sum squared resid	0.000523	Schwarz criterion		-5.177711
Log likelihood	35.09890	Hannan-Quinn criter.		-5.685327
F-statistic	730.1938	Durbin-Watson stat		1.863272
Prob(F-statistic)	0.001368			

The regression results, as shown in Table 7, indicate that in the robustness test, the P-value of IRM is always less than 0.05, and the coefficient of -0.2619 is negative, indicating that the interest rate marketization reform has a significant negative effect on the loan scale of Shanghai Banking Corporation, which is consistent with the previous conclusion. This suggests that the empirical analysis conclusion that the LPR reform has a negative effect on the asset business of Shanghai Banking Corporation is robust.

3.2.6 Analysis of Empirical Results

The regression results indicate that when controlling for the influence of broad money supply growth rate (ΔM2), total scale of third-party payment (IF), year-on-year growth rate of real estate industry's GDP (RE), "Li Keqiang Index" (LKQ), bank deposit scale (LND), and the annual average closing price of the Shanghai Composite Index (SC index), the P-value of the interest rate marketization index (IRM) is less than 0.05, indicating significant regression. The coefficient of -0.1296 represents a negative impact of the interest rate marketization index on the loan scale of Shanghai Banking Corporation. The advancement of interest rate marketization has stimulated competition among various players in the banking industry, affecting the expansion of bank loan scales.

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4. Research Conclusions and Policy Suggestions

4.1 Research Conclusions

Based on the qualitative and quantitative analysis in this paper, it is likely that the loan scale of Shanghai Banking Corporation will expand year by year, but this trend may be temporary. The subsequent impact of LPR reform may become increasingly significant. The net interest margin of Shanghai Banking Corporation may show a trend of first decreasing and then increasing, and the profitability of the bank may experience a decline stage. While acknowledging the positive impact of LPR reform on the real economy and residential housing loans, it is necessary to propose corresponding viewpoints on how to maintain or improve the profitability of Shanghai Banking Corporation in the post-epidemic era. Additionally, suggestions should be made for the advancement of LPR reform and the future development of Shanghai Banking Corporation, aiming to maximize the promotion of interest rate liberalization, enhance bank profitability, and promote the high-quality development of Shanghai Banking Corporation's asset business and even the entire financial system.

4.2 Policy Suggestions

4.2.1 Accelerate Business Transformation

Under the reform of interest rate liberalization, the interest margin between deposits and loans has been significantly reduced, and profit levels have shown a clear downward trend[6]. If small and medium-sized commercial banks want to compete with large commercial banks, they must develop various business activities based on less capital occupation. Small and medium-sized commercial banks should focus on developing small and micro-enterprise business and retail business, fully utilize their regional advantages, strengthen cooperation with different types of customers, and thus increase their influence in their respective regions. By continuously innovating financial businesses and products [7], gradually adjusting business structures, increasing the share of intermediate businesses, reducing reliance on deposit and loan businesses, and reducing expected losses, banks can transform from traditional profit models to new financial service models.

4.2.2 Optimize Liability Structure

Declining loan interest rates will force banks to take corresponding measures to reduce their own liability costs. This can be achieved by adjusting the liability structure to achieve a balance between liquidity and capital costs. Therefore, banks should pay attention to their asset allocation to absorb more deposits, strengthen overall planning for new credit, and adopt deposit-loan linkage methods to maximize the leverage effect of credit resources. As a profit-making organization, commercial banks should pay more attention to their financial situation and continuously adjust their asset and liability structures to achieve sustainable and stable operations. Currently, deposits still account for the largest proportion of funding sources. It is necessary to maintain deposit absorption capacity, but it cannot be limited to deposits alone. Instead, various types of deposit accounts should be enriched to expand funding sources, such as time deposits, transaction account deposits, etc. In terms of loans, measures such as expanding credit scale and increasing interest income can be taken to maintain net interest margins. The key point is that banks should fully leverage their own advantages, such as having a large number of business outlets and a good customer base, to achieve differentiated competition with large banks.

4.2.3 Perfect the Pricing Mechanism

With the deepening of interest rate marketization reform, Bank of Shanghai has gained greater independence in pricing [8]. Therefore, it is necessary to establish an effective product pricing system to provide a clear price benchmark for the development of Bank of Shanghai. On this basis, it is also necessary to fully consider many factors such as depositors and regional economic development, allowing the bank to provide more and more appropriate pricing space for many branches, and formulate more reasonable pricing standards according to the actual situation of the local market [9]. In addition, according to the hierarchy and demand of customers, corresponding reasonable pricing should be formulated.

4.2.4 Improve Internal Management

With the further deepening of interest rate marketization, the proportion of operating costs will increase, indicating the "dilemma" currently faced by Shanghai Bank's management model. The

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traditional method of increasing revenue solely through expansion of loan scale can no longer meet the requirements of interest rate marketization, and only by changing operational efficiency and management models can better results be achieved. In its operation, Shanghai Bank can learn from some advanced management concepts at home and abroad to continuously improve its internal governance structure and operating mechanism.

Against the backdrop of deepening interest rate marketization, Shanghai Bank must continuously strengthen supervision and management of bank funds, optimize internal governance and equity structure, establish internal sense of responsibility, actively absorb private and foreign capital, broaden financing channels, and compensate for the inherent shortcomings of small capital scale.

4.2.5 Strengthen Risk Prevention

After the LPR reform, the fluctuation range of loan interest rates has increased [10], and pricing is linked to the LPR. Asset returns have new uncertainties, and there are also significant risks of narrowing net interest margins. The development of Shanghai Bank is closely related to its own interest rate risks. Therefore, Shanghai Bank should establish and improve internal risk management systems, combining its current interest rate situation to promote the establishment and improvement of internal risk management systems. Second, it is necessary to always pay close attention to the overall development of the macro economy, have a comprehensive understanding of the current economic and social development, and at the same time have a deeper understanding and understanding of interest rates, so as to better prevent the bank's interest rate risks. Finally, it is necessary to strengthen the ability to analyze interest rate risks, study how to use hedging tools to reduce interest rate risks, and use LPR derivatives for risk management. Currently, the scale of China's LPR derivatives market is still small, with few types and incomplete term structures. Therefore, it is necessary to strengthen the cultivation of the derivatives market in order to better prevent and control interest rate risks.

4.2.6 Optimize Customer Management

Currently, a considerable number of depositors are attracted by sufficiently low loan interest rates. However, long-term narrowing of net interest margins will make it difficult for Shanghai Bank to bear the burden, and raising loan interest rates is only a matter of time. Based on this, it is recommended that the bank do a good job in customer maintenance. Separate the market risk and credit risk factors of different customers to complete the separation of credit interest rate risk and credit interest rate spread. Based on the specific requirements and preferences of different customers, different customers are graded and segmented, and a relatively complete management system is established to formulate corresponding pricing strategies, thereby avoiding defaults by high-risk customers and achieving effective transmission of the LPR.

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