Research on the Impact of Commercial Banks' Risk Exposure on Stock Returns: Panel Data Evidence from China

Zhenjie Li
International Business School, Jinan University, Guangzhou, Guangdong Province, 510000, China
lizhenjie1015@gmail.com

ABSTRACT

This paper uses panel data to study the impact of NPL ratio on the performance of China commercial banks. The results show that the higher NPL ratio greatly reduces the performance of banks, mainly due to the decline of asset quality and the increase of risk. The negative impact is most obvious in state-owned banks. Conclusion It remains stable after strength test.

Keywords: Non-Performing Loan Ratio; Credit Risk; Commercial Banks; Heterogeneity Analysis

1. INTRODUCTION

1.1 Background

Commercial banks play a key role in the financial system, and their stability is crucial to economic development. Non-performing loan ratio (NPL) is an important indicator to measure credit risk and asset quality. Increasing NPL ratio will reduce profitability, reduce asset efficiency and increase financial risks. At the same time, differences in ownership, capital strength and risk management will have different effects on different banks.

On this basis, this paper uses the data of 14 banks (2014-2023) and stock returns (2015-2024), and applies regression analysis, robustness test and heterogeneity analysis.

1.2 Literature Review

1.2.1 NPL and Bank/Market Performance

Existing studies have widely examined the impact of the NPL ratio on bank performance and stock markets. From the operational perspective, a higher NPL ratio is usually linked to lower profitability and efficiency, as it reflects poorer asset quality and higher credit risk (Zhang Li, 2026 [1]; Ge Shihui, 2023[7]). Meanwhile, digital transformation and improved risk management can help reduce NPL risk (Ge You, 2025[2]).

From the capital market perspective, the NPL ratio influences stock performance through investor expectations and confidence. Rising NPL ratios tend to weaken confidence and depress stock prices (Liu Tao et al., 2013[10]). In addition, legal environments affect risk perception and valuation (Zhang Jianhua & Wang Peng, 2012[11]). Foreign studies further include credit quality in asset pricing, showing that lower quality leads to higher risk premiums and lower valuations (Mirza et al., 2020 [12]; Arhinful et al., 2025 [13]).

According to signaling theory, changes in the NPL ratio provide information about risk and future profitability, often causing negative market reactions.

1.2.2 External and Heterogeneity Factors

Most of our research focuses on the impact of NPL ratio on bank financial indicators. Some articles also indirectly show how it affects stock returns. Liu Tao et al. (2013), when analyzing state-owned banks and China Construction Bank, said that when the pricing mechanism of risky loans is not perfect, it will increase the NPL ratio. This makes the market worried about the future profits of banks, and leads to the stock price falling [10]. Zhang Jianhua and Wang Peng (2012) said that a good legal environment can reduce the risk of banks, improve the quality of loans and have a good impact on the market value of banks. [11].

Foreign researchers have conducted more direct and systematic tests in this respect. Mirza et al. (2020) used banking data from 14 European countries to evaluate the traditional asset pricing model and put forward bank-specific risk factors. The study found that the credit quality premium-measured by the ratio of NPL to total loans-showed systematic characteristics. Investors demand a higher risk premium for bank stocks with lower credit quality, and this premium is more obvious in small banks. This study provides a theoretical basis for bringing NPL ratio directly into the bank stock pricing framework. Arhinful et al. (2025) found that NPL ratio significantly reduces the valuation indicators such as price-to-earnings ratio (P/E) and price reconciliation ratio (P/B), which indicates that higher credit risk will weaken market valuation. At the same time, their research results emphasize that institutional reputation plays an important role in how investors interpret such risk signals. [13]

1.2.3 Market Reaction to NPL Ratio

According to signal theory, NPL ratio provides us with important information about the risk level and future profit of banks. As mentioned above, investors regard it as a key signal to judge banks. When the NPL ratio rises, it is usually a bad signal. This shows that the quality of assets declines and the potential losses increase. This weakens investors' confidence, increases their perceived risk and leads to higher premium risk; Eventually, the stock price and the rate of return fell (Arhinful et al., 2025) [13]. In addition, the market reaction may depend more or less on the quality of corporate governance, information transparency and investor protection.

1.2.4 Bank Size and Heterogeneity Effects

The scale and ownership structure of banks affect the perception and price of risks. Large banks often take advantage of the expectation of "too big to fail", which may weaken the negative reaction of the market. He Guosheng and Li Xiaobin (2024) found that the relationship between ESG performance and NPL ratio of state-owned banks is greater, which shows that they are more sensitive to the institutional rules of risk management.

1.2.5 Interaction between External Risks and Bank Risks

Bank credit risk is not only affected by internal factors, but also by macroeconomic policies and market environment. Guo Zining and Li Xing (2025) [3] pointed out that the decline in interest rates has increased the difficulty of managing NPL risks, which requires stronger identification and foresight. Liu Jiawei (2025) [4] emphasized the importance of systematic risk management to stabilize market expectations. He Guosheng and Li Xiaobin(2024)[5] show that better ESG performance reduces NPL ratio and enhances confidence. Deng Jing et al. (2023) and Zhang Ying et al. (2023) found that environmental regulations and green credit significantly affect the quality of loans and can be transferred to the stock market [6] [8].

1.2.6 Literature Summary

In a word, the existing research focuses on how NPL ratio affects the performance of banks and stock markets, and tries to understand the reasons from several aspects. Foreign research goes further: they include credit quality in asset evaluation, explain and transmit through investor confidence, use event research and other methods, and show the influence of bank size through the "too big to fail" framework. However, there are few direct studies on returned inventory, especially those that use lag (lag structure) and solve endogenous problems. The analysis of the differences between bank types is not deep enough. Our article fills these shortcomings: we use lag variables, fixed effects, instrumental variables and make regression for different types of banks.

2. THEORETICAL ANALYSIS AND RESEARCH HYPOTHESES

The relationship between bank credit risk and stock market performance is very important in the financial field. NPL ratio is a key indicator of credit risk, which tells us whether the bank's asset quality is poor. It can also affect stock returns through investor expectations, market confidence and premium risk. Based on signal theory, risk compensation theory and "too big to fail" hypothesis, this paper puts forward its research hypothesis.

According to signal theory, public indicators such as NPL ratio provide investors with important information. An increase in NPL ratio is usually regarded as a bad signal. This means that the ability to recover loans is weak and there may be more losses. This may increase concerns about future cash flows, strengthen risk aversion, and prompt investors to demand higher premium risks, which may reduce stock prices and stock returns (Mirza et al., 2020; Arhinful et al., 2025) [12] [13].

According to the risk compensation theory, the inventory return should show the specific risks of banks. Higher NPL ratio means more credit risk, which increases the risk of investors. Even in theory, more risks should give more returns. In

reality, we often see the stock price drop first, not the higher returns. Therefore, it is expected that there will be a negative correlation between NPL ratio and inventory return rate.

In addition, the impact of credit risk may have a lag effect. On the one hand, financial information is provided from time to time, which delays investors' understanding of NPL information. On the other hand, NPLs are created and discovered after loans, and they need time to affect profits and market confidence. Therefore, this paper uses NPL ratio with three delay periods to understand the dynamic transmission process. Based on this analysis, hypothesis 1 is put forward.

H1: The NPL ratio has a significant negative impact on bank stock returns, and this impact exhibits a lag effect.

In addition to the main variables, three other factors-commission coverage (PCR), bank size and loan principal ratio (LPR)-may also affect the return of stocks. PCR is the ratio between loan loss reserve and NPL amount. This shows whether the bank can bear the credit risk. Higher PCR may mean that they are better prepared for losses, which makes investors more confident. But sometimes, high PCR may also be a signal that there are more risks, because a large supply is often accompanied by a large number of NPL or high-risk assets (Liu Tao et al., 2013) [10], which may reduce the stock return. This is called the "risk exposure signal hypothesis".

Large banks usually have stronger capital, better risk control and a more stable customer base, which supports greater stability and better returns. However, they are usually in the mature stage, and their growth is limited, resulting in a low valuation premium. In addition, the expectation of "too big to fail" can reduce perceived risk by reducing the required risk premium and stock return.

As a key macro-variable, the loan interest rate (LPR) affects the return of bank stocks through two channels: the increase of interest rate increases the financing cost and inhibits the credit demand, thus reducing the net interest rate. It also increases the repayment pressure of borrowers, increases the NPL ratio in the future, and has negative expectations for asset quality. Therefore, the increase of LPR is expected to inhibit the return of bank stocks. To sum up, hypothesis 2 is put forward.

H2: The Provision Coverage Ratio, Bank Size, and Loan Prime Rate all exert a negative influence on bank stock returns, albeit through distinct mechanisms—PCR via signaling risk exposure, Bank Size via constrained growth expectations, and LPR via compressing profit margins and elevating credit risk expectations.

In addition, banks with different ownership structures may have great differences in risk perception, market reaction and investor expectations. State-owned banks usually benefit from the implicit guarantee of the government, which reduces their financing cost and risk premium. However, this may also make investors more sensitive to changes in their risk profile, because the increase in NPL ratio may indicate greater systemic risks and trigger stronger negative reactions.

Non-state-owned banks rely more on market financing, and are more susceptible to macroeconomic conditions and interest rate fluctuations. Without implicit guarantees, investors rely more on financial indicators and external factors to assess their risks. Therefore, macroeconomic variables such as LPR may have a more obvious impact on its stock returns. On this basis, hypothesis 3 is put forward.

H3: The negative effect of the NPL ratio on stock returns is stronger for state-owned banks, while macro factors such as LPR have a greater impact on non-state-owned banks.

3. RESEARCH DESIGN

3.1 Variable Definitions

Dependent Variable: Annual Bank Return (Yield)

This paper selects the annual bank return as the dependent variable, calculated using logarithmic returns.

3.1.1 Core Explanatory Variable: Non-Performing Loan Ratio (Nplra)

This paper uses a three-period lag (L3_Nplra) to mitigate endogeneity issues.

3.1.2 Control Variables

Regarding internal bank factors, Return on Assets (ROA), Loan-to-Deposit Ratio (LDR), Provision Coverage Ratio (Pvcra), and Bank Size (lnSize) are selected as control variables. Regarding external macro factors, the one-year Loan Prime Rate (Lpr) is selected as a control variable. The variable descriptions are shown in Table 1.

Table 1. Variable Definitions

Variable Type	Variable Name	Variable Symbol	Variable Design
Explanatory Variable	Non-Performing Loan Ratio	Nplra	Non-Performing Loans / Total Loans
Dependent Variable	Annual Return	Yield	$\ln P_t/P_{t\text{-}1}$
Control Variable	Loan-to-Deposit Ratio	LDR	Total Loans / Total Deposits
	Return on Assets	ROA	Net Profit / Total Assets
	Provision Coverage Ratio	Pvcra	Loan Loss Provisions / Non-Performing Loan Balance
	Bank Size	lnSize	Natural Logarithm of Total Assets
	Loan Prime Rate	Lpr	One-Year LPR published by the People's Bank of China

3.2 Sample Selection and Data Processing

3.2.1 Sample Selection

This study selects 14 listed commercial banks in China, including 5 state-owned banks, 6 joint-stock banks, and 3 city commercial banks. The sample covers financial data from 2014 to 2023 and stock return data from 2015 to 2024. Financial data are mainly obtained from bank annual reports, stock price data from the East Money database, and macroeconomic data from the National Bureau of Statistics.

3.2.2 Data Processing

Before empirical analysis, the raw data underwent systematic organization and processing: (1) Matching and integrating data from different sources. Considering that financial data is annual frequency while stock returns are calculated annually, this paper constructs panel data structured by "Bank-Year" and achieves variable alignment through lag processing, i.e., matching previous period financial indicators with subsequent period stock returns. (2) Uniformly constructing variables. Stock return is calculated using logarithmic returns. Indicators like NPL ratio, LDR, and PCR are calculated according to their defined formulas. Bank size is the natural logarithm of total assets. (3) Cleaning the sample data. Observations with missing values for key variables were removed to ensure the validity of regression results. After processing, the baseline regression sample consists of 111 observations. (4) Conducting preliminary tests on variable distributions. According to descriptive statistics, the value ranges of all variables are reasonable, and no significant outliers were identified; therefore, no further winsorization was performed. Correlation analysis results indicate no serious multicollinearity issues among variables.

3.3 Research Methodology

This study employs panel data regression to examine the relationship between bank credit risk and stock returns. First, descriptive statistics and correlation analysis are conducted to understand the basic characteristics of the data. Then, an OLS model is used as the baseline to test the effect of the NPL ratio. Robustness is further checked by replacing variables and applying instrumental variable methods. Finally, heterogeneity analysis is performed through grouped regressions.

In addition, to control for unobservable bank-specific factors such as risk preference and business strategy, an individual fixed effects model is introduced. The Hausman test is used to choose between fixed and random effects models.

3.4 Baseline Regression Model

To test the research hypotheses, this paper establishes the baseline regression model as shown in Equation (1):

$$Yield_{it}=\alpha+\beta_1 Nplra_{it\text{-}3}+\beta_2 Controls_{it\text{-}1}+\mu_i+\varepsilon_{it} \quad (1)$$

In this model, the dependent variable represents the annual stock return of bank i in year t. The core explanatory variable is the NPL ratio with a three-period lag. Control variables include bank-level and macroeconomic factors. Individual fixed effects are included to capture unobserved heterogeneity, and the error term represents random disturbances.

4. EMPIRICAL ANALYSIS

4.1 Descriptive Statistics and Correlation Analysis

The results of descriptive statistics and correlation analysis are shown in Table 2 and Table 3. As shown in Table 2, the average Yield of stocks is 0.098, and the standard deviation is 0.285, ranging from -0.499 to 1.329. This shows that the inventory returns between banks vary greatly.

The average NPL ratio is 0.014, and the standard deviation is relatively small, which indicates that the credit risk level is generally stable, although there are some differences among banks. In contrast, LDR and PCR show greater standard changes, reflecting the changes in loan structure and risk management ability.

Table 3 shows the related results. NPL ratio is negatively correlated with stock returns (-0.116), which provides preliminary support for this hypothesis. In addition, NPL ratio is significantly negatively correlated with PCR (-0.637) and positively correlated with LDR (0.492), suggesting that credit expansion may be accompanied by higher risks. Overall, the correlation coefficient is moderate, indicating that there is no serious multilinear problem.

Table 2. Descriptive Statistics Results

Variable	N	Mean	Std. Dev.	Min	Max
Yield	139	0.098	0.285	-0.499	1.329
L3_Nplra	111	0.014	0.003	0.0077	0.0239
L_LDR	139	0.830	0.132	0.474	1.112
L_Pvcra	139	2.385	1.040	1.324	5.255
L_ROA	139	0.009	0.002	0.004	0.014
L_lnSize	139	29.602	1.036	27.041	31.431
L_Lpr	139	0.039	0.004	0.031	0.043

Table 3. Pearson Correlation Analysis

Variable	Yield	L3_Nplra	L_LDR	L_Pvcra	L_ROA	L_lnSize	L_Lpr
Yield	1						
L3_Nplra	-0.116	1					
L_LDR	-0.096	0.492***	1				
L_Pvcra	0.080	-0.637***	-0.479***	1			
L_ROA	-0.007	-0.276**	-0.468***	0.297***	1		
L_lnSize	-0.007	0.516***	0.197*	-0.485***	0.095	1	
L_Lpr	-0.159	0.018	-0.405***	-0.147	0.411***	-0.243**	1

4.2 Baseline Results

The basic results of regression are shown in Table 4. For the main explanatory variable, the NPL ratio coefficient with three delays is -31.733 and is significant at the 1% level. This shows that the increase of NPL ratio leads to a sharp decline in the return on bank stocks, which supports hypothesis 1.

This result shows that higher credit risk weakens stock performance by affecting investors' expectations and market confidence. From the economic point of view, the increase of NPL ratio indicates that the asset quality is poor, and the uncertainty of future profitability increases, which intensifies investors' aversion to risk and brings downward pressure on the stock price. The use of storage variables also reflects the delayed transmission of credit risk to the stock market.

As for the control variables, the effect is different. The PCR coefficient is -0.276, which is significant at the level of 1%, indicating that higher supply may reflect greater risk exposure, thus reducing the inventory return. The coefficient of bank size is -1.270, which is also equivalent to the level of 1%, which indicates that the return rate of large banks is often low, which may be due to the limited growth potential.

For macro factors, the LPR coefficient is -76.219, which is significant at the level of 1%. This means that when interest rates rise, they reduce the inventory of returns by increasing financing costs and reducing credit demand. Therefore, assumption 2 is supported.

The r of the model is 0.319, which indicates that about 31.9% of the stock changes are explained by the model. Overall, the results confirm the negative impact of credit risk on stock performance.

Table 4. Baseline Regression Results

Variable	(1) Stock Return (Yield)
L3_Nplra	-31.733*** (9.056)
L_LDR	0.490 (0.490)
L_Pvcra	-0.276*** (0.066)
L_ROA	-15.396 (32.716)
L_lnSize	-1.270*** (0.227)
L_Lpr	-76.219*** (8.242)
Constant	41.577*** (6.758)
R^2	0.319
N	111
Individual Fixed Effects	YES

4.3 Robustness Tests

To mitigate and overcome endogeneity issues, the following steps were taken:

4.3.1 Variable Substitution

To test the robustness of the model, the main explanatory variables are replaced by the offset ratio of NPL in two periods, while the control variables are offset by one period. The results of regression are shown in Table 5. The coefficient of this variable is 17.716, but it failed the significance test. The migration of the two periods has no significant impact, which indicates that the estimated impact is a sensitive migration specification. In addition, the signals and significance levels of other control variables are generally consistent, indicating that the model has good overall robustness.

Table 5. Endogeneity Test (Variable Substitution)

Variable	(1) Stock Return (Yield)
L2_Nplra	17.716 (10.070)
L_LDR	-0.256 (0.386)
L_Pvcra	-0.110* (0.061)
L_ROA	-19.972 (22.433)
L_lnSize	-0.637*** (0.134)
L_Lpr	-53.818*** (5.826)
Constant	21.498*** (3.980)

Table 5. (continued) Endogeneity Test (Variable Substitution)

Variable	(1) Stock Return (Yield)
R^2	0.170
N	125

4.3.2 Endogeneity Test (Instrumental Variable Approach)

In view of the possible reverse causality between NPL ratio and stock returns, we use variable instrument method. We choose the NPL ratio and the deviation of two periods as the instrument. It is related to the current NPL ratio, but it will not directly affect the current inventory return.

The results in Table 6 show that the first step regression is significant at the level of 1%, which indicates that there is no problem of weak instruments. In the second step, the coefficient changes in amplitude and significance, which indicates that there may be endogeneity in the basic model. However, the overall economic explanation remains unchanged, which supports the robustness of the research results.

Table 6. Instrumental Variable Regression Results (2SLS)

Variable	First Stage (Nplra)	Second Stage (Yield)
L2_Nplra	0.5348*** (0.0639)	—
LDR	-0.0009 (0.0015)	-0.7260** (0.3022)
Pvcra	-0.0014*** (0.0002)	-0.0033 (0.0574)
ROA	0.1310 (0.1128)	26.6158 (21.9031)
lnSize	-0.0006 (0.0002)	-0.0633 (0.0478)
Lpr	0.1171 (0.0575)	-38.2773*** (13.3072)
Constant	0.0066 (0.0090)	3.3095* (1.7627)
R^2	0.8384	0.0586
N	125	125

Note: The first stage reports the regression of the instrumental variable on the endogenous variable. The second stage reports the Two-Stage Least Squares (2SLS) regression results.

4.3.3 Fixed Effects Test

To account for unobservable bank-specific factors, the Hausman test is conducted to compare fixed and random effects models. The results show a Chi-square value of 42.60 with a p-value of 0.0000, leading to the rejection of the null hypothesis. Therefore, the fixed effects model is adopted.

After controlling for individual effects, the coefficient of the core variable remains stable, further supporting the robustness of the results.

Table 7. Hausman Test Results

Statistic	Value
Chi-square	42.60
p-value	0.0000
Conclusion	Reject H0, Adopt Fixed Effects Model

Note: The null hypothesis (H0) is that the random effects model is more efficient. If the p-value is less than 0.05, H0 is rejected, and the fixed effects model is chosen.

4.4 Heterogeneity Analysis

The sample is divided into state-owned and non-state-owned banks based on ownership structure, and the results are reported in Table 8.

First, for the NPL ratio, the coefficient for state-owned banks (-62.292) is much larger in absolute value than that for non-state-owned banks (-20.534), indicating that state-owned banks are more sensitive to credit risk changes.

Secondly, the commission coverage rate shows a significant negative impact in both groups, and it has a greater impact on state-owned banks, which shows that it is more sensitive to risk signals.

Third, the scale of banks has the opposite effect, which is positive for state-owned banks, but negative for non-state-owned banks, which means that large state-owned banks benefit from economies of scale, while non-state-owned banks may face restrictions when expanding.

Finally, LPR has a greater impact on non-state-owned banks, indicating that they are more affected by market conditions. Therefore, assumption 3 is supported.

Table 8. Heterogeneity Analysis

Variable	State-Owned Banks	Non-State-Owned Banks
L3_Nplra	-62.292 (29.746)	-20.534 (14.329)
L_LDR	-4.082* (1.783)	0.493 (0.556)
L_Pvcra	-0.683*** (0.117)	-0.251** (0.084)
L_ROA	280.206* (116.416)	-1.837 (40.901)
L_lnSize	2.746** (0.693)	-1.377*** (0.202)
L_Lpr	2.947 (29.872)	-77.245*** (8.638)
Constant	-81.335** (21.787)	43.649*** (6.138)
R^2	0.510	0.334
N	40	71

5. MAIN CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Main Conclusions

Based on the panel data of China Commercial Bank, this paper studies how NPL ratio affects bank performance. The results show that higher NPL ratio is related to lower stock return, which indicates that the increase of credit risk weakens market performance. This effect mainly plays a role by reducing asset quality and increasing the uncertainty of future profitability.

With the accumulation of NPL, banks have to give up more supply, which puts pressure on marginal profits and reduces operational efficiency. At the same time, the differences between different types of banks are also obvious. The influence of NPL ratio varies with ownership structure, which indicates that risk sensitivity and market perception are inconsistent.

In addition, after applying various robustness checks and solving potential endogeneity, the main conclusions remain stable. This enhances the reliability of empirical results and supports the overall research conclusion.

5.2 Policy Recommendations

In view of the above results, we can consider some impacts on policies. First of all, commercial banks should pay more attention to the management of non-performing loans. Therefore, it is necessary to improve the pre-loan credit evaluation and strengthen the post-loan monitoring to monitor the formation of new NPL.

At the same time, it is still crucial to improve the ability of risk management. Banks need to improve their internal systems, adopt more effective risk assessment tools, and improve their ability to identify and deal with potential risks at an early stage.

Because different types of banks face different risk conditions, it is necessary to adjust the regulatory policies accordingly, paying special attention to non-state-owned banks and small banks.

Finally, optimizing the capital structure can further improve the toughness. By strengthening sufficient capital and maintaining adequate buffers, banks will be able to better cope with external shocks and ensure long-term stable development.

REFERENCES

[1] Zhang Li. Research on Optimization of Financial Risk Management in State-Owned Listed Banks—Focusing on Capital Adequacy Ratio and Non-Performing Loan Control [J]. Economist, 2026, (01): 133-134+139.
[2] Ge You. The Impact of Digital Transformation of Commercial Banks on Non-Performing Loan Ratio [J]. Technology and Market, 2025, 32(11): 165-171.
[3] Guo Zining, Li Xingzhou. Risk Management and Countermeasures for Non-Performing Loans in Commercial Banks under the Trend of Declining Interest Rates [J]. Finance and Accounting, 2025, (07): 79-80.
[4] Liu Jiawei. An Engineering Path for Risk Management in Commercial Banks [J]. China Finance, 2025, (03): 55-56.
[5] He Guosheng, Li Xiaobin. ESG Performance and Non-Performing Loan Ratio of Commercial Banks—An Empirical Study Based on China [J]. Finance Forum, 2024, 29(02): 26-36. DOI: 10.16529/j.cnki.11-4613/f.2024.02.003.
[6] Deng Jing, Zhou Pengcheng, Song Xiaoxiao, Gu Xuesong. The Impact of Green Credit on Loan Risk of Commercial Banks—From the Perspective of Regional Environmental Regulation Differences [J]. Finance Forum, 2023, 28(12): 16-27.
[7] Ge Shihui. Research on the Impact of Capital Adequacy Ratio, Return on Assets, and Non-Performing Loan Ratio on the Efficiency of Commercial Banks [J]. Green Finance and Accounting, 2023, (08): 10-14. DOI: 10.14153/j.cnki.lsck.2023.08.009.
[8] Zhang Ying, Liu Xiaoya, Shi Zhiqi, Zhang Mengjie. Bank Operation and Social Responsibility: Research on the Impact of Green Credit on Asset Quality of Commercial Banks [J]. Journal of Southeast University (Philosophy and Social Science Edition), 2023, 25(03): 51-64+147. DOI: 10.13916/j.cnki.issn1671-511x.2023.03.013.
[9] Gu Haifeng, Gao Shuiwen. Does Monetary Policy Uncertainty Affect Bank Loan Quality? — Evidence from 123 Commercial Banks in China [J]. Finance and Trade Research, 2022, 33(07): 54-68. DOI: 10.19337/j.cnki.34-1093/f.2022.07.005.
[10] Liu Tao, Zhang Tongjian, Zhang Tianlong. An Empirical Analysis of the Micro-Mechanism of Risk Loan Pricing in China Construction Bank [J]. Financial Theory and Practice, 2013, (05): 48-53.
[11] Zhang Jianhua, Wang Peng. Bank Risk, Loan Scale, and Legal Protection Level [J]. Economic Research Journal, 2012, 47(05): 18-30+70.
[12] Mirza, N., Hasnaoui, A., & Rahat, B. (2020). Credit Quality and Stock Returns of Commercial Banks. Economics Bulletin, 40(1), 1-17.
[13] Arhinful, D. K., Adjei, S., & Ofori, S. (2025). Non-Performing Loans and Their Impact on Investor Confidence: A Signaling Theory Perspective—Evidence from U.S. Banks. Journal of Risk and Financial Management, 18(7), 383. DOI: 10.3390/jrfm18070383.