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Active Allocation of Commercial Bank Credit Asset Structure Under the Impact of the Epidemic

Shuoqi Yang[1,2], Nazrul Hisyam Ab Razak[1], Fakarudin Kamarudin[1]

[1]School of Business and Economics, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

[2]Corresponding Author Email: yshq121806@gmail.com

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Abstract

The outbreak of the COVID-19 epidemic presents significant challenges not only to natural ecosystems, public health, and economic development but also exerts pressure on the financial sector through its repercussions on the real economy, thereby introducing negative risk factors within the financial domain. Given that China's financial system is predominantly characterized by commercial banks and relies heavily on indirect financing, the epidemic is expected to pose a series of challenges to this system, particularly concerning the risk profile of the banking sector and the allocation of its credit assets. In light of this context, the present study seeks to investigate the impact of the epidemic on the structural allocation of banks' credit assets, specifically examining whether commercial banks will proactively adjust their credit asset allocation in response to the objective risks posed by the epidemic. The findings indicate that the epidemic has adversely affected the credit scale structure of banks, leading to a reduction in credit allocation to collateralized loans and sectors particularly vulnerable to the effects of the epidemic. Secondly, the epidemic serves as a mechanism that influences the proactive allocation of credit assets by local commercial banks through an increase in their loan loss provisions. Moreover, the epidemic exerts a more significant impact on the structural allocation of credit assets in smaller, less well-capitalized, and less liquid local commercial banks compared to their larger, better-capitalized, and more liquid counterparts. Lastly, the effect of the epidemic on the proactive allocation behavior of credit assets by banks is more pronounced in the less economically developed central and western regions of China than in the more economically advanced eastern regions.

Keywords: Epidemic, Commercial Banks, Credit Asset Structure

Introduction

The 2020 New Crown epidemic became a watershed moment in global economic development, leading to a near-total regression of the global economy. Owing to its high transmission, countries adopted embargo measures, such as shutting down transportation, stopping work and production and physical quarantine, to prevent and control the spread of the epidemic. However, while these measures controlled the epidemic, they also brought the real economy to a standstill and corporate revenues plummeted.

China's financial system is dominated by indirect finance, with banks supporting the real economy through credit. The outbreak of the epidemic through losses in the real economy may pose a risk to banks. Commercial banks may reduce credit investment to avoid this uncertainty. Although this behavior may reduce the risk of banks, it may also exacerbate the plight of the real economy and form a negative feedback effect of credit asset allocation. It has been shown that commercial banks engage in uncertainty avoidance by reducing credit allocation (Bordo et al., 2016; Valencia, 2017). Therefore, whether commercial banks will proactively adjust their credit asset structure to cope with the epidemic risk in the context of the epidemic has become a question that deserves further exploration.

Theory suggests that epidemics can lead to a decline in the value of household and corporate collateral, increasing the risk of default and, in turn, bank risk. Whereas uncertainty and risk are important factors in the provision of capital by financial intermediaries (Pástor & Veronesi, 2013), an increase in bank risk may lead to banks' lending shyness, which in turn reduces credit allocation. In particular, epidemics may affect the solvency of households and firms through collateral depreciation, which in turn affects banks' risk-taking. (Research Bureau of the People's Bank of China, 2020) The report points out that the depreciation of collateral has become the core issue of the epidemic's credit risk to banks (Research Bureau of the People's Bank of China Subject Group, 2020). In order to avoid the risk, commercial banks may reduce the placement of mortgage-type loans. In addition, industries directly affected by the epidemic, such as agriculture, forestry, animal husbandry and fishery, transportation, accommodation and catering, have seen their corporate assets damaged and operating profits fall, which in turn affects their willingness to repay and increases the level of bank risk. In order to avoid damage to their assets, commercial banks may take the initiative to adjust their credit asset allocation to these industries. The economic difficulties of these industries make banks more cautious in their credit decisions, thus reducing their credit support to these high-risk industries. In this regard, the paper poses the research question: How will the active allocation of commercial banks' credit asset structure be affected by the epidemic?

Based on this, in the reality of China's economic operation, in the face of the rising risk of the epidemic, on the basis of the risk posed by the epidemic to the banking sector, does the epidemic in China further affect the structural allocation of credit assets by local commercial banks, i. e. , after realizing the objective risk posed by the epidemic, do commercial banks take the initiative to adjust the structural allocation of their credit assets in order to avoid the damage to their risky assets? Further, through what channels does the epidemic affect the structural allocation of banks' credit assets? How does the relationship between the two differ in terms of bank characteristic heterogeneity and regional heterogeneity?

Due to the complexity of the mechanism of interconnection and interaction between epidemics and the financial system, existing studies are less concerned with the impact of epidemics on the behavior of banks' asset structure allocation. There are fewer foreign case studies and a lack of in-depth analysis of bank credit asset allocation in the context of the epidemic. Although domestic research is more complete in the optimization of commercial banks' credit asset structure, and clarifies the influence of monetary policy, industrial structure, business performance and other factors, it is still insufficient to explore the unexpected event of the epidemic.

Therefore, the impact of epidemics on banks' credit asset allocation is not only related to the risk of epidemics, but also closely related to bank characteristics and the level of regional economic development. Studying the impact of epidemics on banks' credit asset allocation can help provide insights into how banks cope with uncertainty, how they adjust their credit asset allocation, and, in particular, how they manage risk in the context of epidemics. At the same time, this research is of great significance to policymakers, and can provide a theoretical basis for improving the quality and efficiency of financial services to the real economy and improving financial risk management. Overall, exploring the above issues not only helps to deeply understand the microeconomic consequences of the epidemic on the structural allocation of bank credit assets, but also provides empirical support and theoretical guidance for the formulation of economic policies to improve the quality and efficiency of financial services to the real economy. Exploring the impact of the epidemic on the structural allocation of bank credit assets is not only conducive to a deeper understanding of the microeconomic consequences of the epidemic on the banking sector, but also helps to provide empirical evidence for the active allocation of bank credit assets under the impact of the epidemic, and at the same time is of practical significance for improving the quality and efficiency of financial services to the real economy.

Literature Review

Domestic and foreign researchers believe that the factors affecting the structural allocation of credit assets of commercial banks are manifold. This study begins with a literature review of the factors affecting the credit asset structure allocation of commercial banks.

China's credit structure problem is essentially a credit rationing problem, the market cannot be cleared through interest rates, there is always an excess demand for credit, and information asymmetry is the root cause. Stiglitz and Weiss (1981) first established a theoretical model to prove that information asymmetry leads to credit rationing, assuming that the borrowers are heterogeneous and the firms' risk aversion is diminishing, and found that increasing the guarantees will instead increase credit rationing due to adverse selection. Whette (1983) further demonstrates that raising guarantees also leads to adverse selection when borrowers are risk neutral. To address the information asymmetry problem, guarantee and co-collateralization mechanisms were developed. Bester (1985) suggests that collateral and interest rates can be used as a screening mechanism to help banks distinguish between high-risk and low-risk loan programs.

Financial ownership discrimination occurs in the presence of information asymmetry, and there is ownership discrimination in the credit structure of commercial banks, as evidenced by many studies that state-owned enterprises (SOEs) are prioritized for loans despite their inefficiency and lack of innovation, whereas the private sector, facing financing constraints, is efficient and grows fast. Ownership discrimination leads to the “leakage effect”, i. e., financial resources flow from the state sector to the discriminated private sector. Lu and Yao (2004) proves this phenomenon through provincial data, pointing out that the reasons for bank credit discrimination include political factors, the high risk of non-state enterprises, and the influence of financial regulatory policies. Financial ownership discrimination not only leads to difficulties in financing the private sector, but also is unfavorable to the development of the state-owned sector, increasing non-performing loans and financial risks. The private economy's predicament stems from the state-owned financial system's support for state-

owned enterprises and the difficulty for private enterprises to obtain financial support (Singh & Chen, 2020). Li (2022) believes that banks lend more to state-owned enterprises, and private enterprises are subject to credit discrimination and increased financing costs. Financial ownership discrimination even affects economic growth, Liu (2011) argued that inefficiency of state-owned economy drags down economic growth.

On the other hand, scholars argue that the credit structure of commercial banks shows obvious regional imbalances, with huge gaps in credit support between rural and urban areas, and between central and western and southeastern coastal regions. Glick and Hutchison (2009) found for the first time that credit funds flowed from rural and backward areas to urban and developed areas, leading to credit hollowing out. It is pointed out that there is a "threshold value" between credit and investment in different regions, indicating that the relationship between credit and investment varies from region to region (Liu et al., 2021). Girotti and Salvadè (2022) found that bank loan acquisition opportunities are greater in regions with good rule of law environments and less government intervention. The regional imbalance in credit stems from the imbalance in local government intervention, the level of rule of law, and the level of economic development. Zhang et al. (2020) found significant differences in the size and structure of bank credit across China's regions by examining panel data from 30 Chinese provinces from 2009-2018, which had different impacts on the growth of the real economy. Mao and Ma (2021) further demonstrates the relationship between regional economic growth and bank credit in China, although the article finds that bank credit contributes most to economic growth in the central part of the country, followed by the eastern part and finally the western part.

The credit structure of commercial banks is also influenced and even constrained by other factors. Progress in the rule of law provides important institutional guarantees for financial development, Wijatmoko et al. (2023) further argues that for countries with economies in transition, the efficiency of the actual implementation of the rule of law is more important than the letter of the law in promoting financial development. In addition, Cheng and Wang (2022) argued that the frequent listing and financing behavior of Chinese commercial banks has enriched the capital and reduced the operational risk, but it also brought about the excessive expansion of credit, which adversely affected the monetary policy transmission mechanism, and then weakened the effect of monetary policy. Nguyen and Dinh (2022) argued that in the short term, tight monetary policy leads to a rise in the number of deposits, an expansion in the size of loans, and an increase in the risk of commercial banks; in the long term, the effect of tight monetary policy leads to a decline in the size of loans, the size of deposits is relatively stable, and the risk of commercial banks is reduced.

Previous research on banks' asset structure allocation mainly focuses on the impact of banks' external environment and internal factors on credit asset structure, but the impact of epidemics on banks' asset structure allocation is less explored. Foreign studies have constructed models to analyze bank management and explore the influencing factors of credit asset structure based on the theories of information asymmetry, loan portfolio, risk-return, etc., but fewer example studies have been conducted. Domestic research on the optimization of credit asset structure of commercial banks has been gradually improved, indicating that factors such as monetary policy, industrial structure, business performance and credit risk have a greater impact on credit asset structure. Commercial bank credit asset structure

adjustment is a long-term dynamic process. Despite the late outbreak of the epidemic, China has been greatly affected by the epidemic and commercial banks dominate the Chinese financial system, so it is of great significance to study the structural allocation of bank credit assets in the post-epidemic era.

Research Methodology

Theoretical Analysis and Research Hypotheses

The Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

First, bank credit assets are the highest and most important, and are affected by a number of factors, including bank characteristics, operating principles and the external environment. Epidemic shocks increase banks' risk-taking by affecting the balance sheets of enterprises and residents, thereby reducing the quality of bank credit assets. Epidemic risk increases banks' loan-shy behavior, which makes credit allocation more cautious and even leads to an increase in non-performing loan ratios and a reduction in credit supply (Walker et al., 2023). In addition, the epidemic will raise the cost of loans by affecting firms' lending conditions and prompting banks to reduce their risk assets and the size of their credit.

Banks' credit funding comes mainly from customer deposits, and outbreak-induced deposit withdrawals increase banks' liquidity risk and lead to a reduction in credit availability. Households and businesses tend to be conservative in the face of the epidemic, increasing cash reserves and reducing deposits, which in turn affects banks' ability to lend (Chaudhary & Piracha, 2021). At the same time, the epidemic caused collateral to depreciate, increasing banks' credit risk and prompting them to tighten mortgage limits or raise interest rates in response (Cerqueiro Bybrant et al., 2021). Inadequate post-disaster insurance exacerbated collateral depreciation, further reducing financing conditions and prompting banks to reduce mortgage origination (Massa & Zhang, 2021).

In addition, the epidemic has affected the agricultural and foreign trade sectors, as well as vulnerable sectors such as retail, food and beverage, and tourism. Labor-intensive, import-export-dependent, and consumer-participation industries were the most severely affected, leading to a decline in solvency and an increase in the risk of non-performing loans (Fallenius, 2024). As a result, the epidemic raises the level of bank risk, prompting banks to adjust their credit allocation to vulnerable sectors, further affecting credit supply. On this basis this study proposes hypothesis 1.

Hypothesis 1: The epidemic will lead to commercial banks to allocate less credit asset size structure, which reduces the allocation of credit asset structure to mortgage loans and industries vulnerable to the epidemic.

The Mechanism of the Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

Banks assess the risk and provide for loan losses based on factors such as the borrower's ability and willingness to repay and the value of the collateral. Ozili (2022) argued that when enterprises' investment and financing, profitability and macroeconomic fluctuations are subjected to negative shocks by external uncertainties, banks make more loan loss provisions to cope with the subsequent credit risks that may arise. When faced with external uncertainty shocks such as epidemics, this can lead to loss of assets of firms and households, reducing

repayment capacity and thus increasing the rate of non-performing loans (Klomp, 2014). This affects bank capital stock and leads to credit contraction. In addition, banks' deepened risk perception, especially in anticipation of epidemic risk, prompts them to make adequate provisions to cope with shocks (Faiella & Lavecchia, 2022). However, banks' provisioning for loan losses leads to adjustments in the structural allocation of banks' credit assets. Duan et al. (2011) found that the provisioning of loan losses in China affects the lending capacity of commercial banks. When capital ratios fall, banks reduce credit, especially to small and medium-sized enterprises. Therefore, the epidemic will affect bank risk through the decline in the value of collateral and the impairment of the operating capacity of the relevant industries, and this study hypothesizes that this may also prompt local commercial banks to scale back the proportion of collateralized loans and credits in the relevant vulnerable industries affected by the epidemic through the provisioning for loan losses and thus. Based on this, the study proposes hypothesis 2.

Hypothesis 2: Epidemic affects banks' credit asset structure allocation behavior through higher loan loss provisions.

Heterogeneity Analysis of the Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

Small and medium-sized banks, whose credit operations are concentrated in SME lending, have difficulty in diversifying their risks under the epidemic shock, leading to a greater incentive to restructure their credit assets. Walker et al. (2023) argue that large banks are less affected by the epidemic due to their diversified asset portfolios. Capital adequacy is an important factor affecting banks' credit allocation (Carlson et al., 2013). Studies have shown that capital adequacy regulation reduces banks' credit risk appetite, which leads to credit-tightening credit behavior, especially for SME lending (Huang Xian et al., 2005). In addition, undercapitalized banks rely on retained earnings to replenish capital and reduce loan origination. Epidemic risk has a greater impact on the liquidity of low-capitalized banks, causing them to reduce loan supply (Lee et al., 2022). Based on this, this study proposes Hypothesis 3a.

Hypothesis 3a: The impact of the epidemic on the structural allocation of credit assets of smaller local commercial banks with lower capital adequacy and liquidity levels will be greater than that of larger local commercial banks with higher capital adequacy and liquidity levels.

The impact of the epidemic on banks' credit asset allocation not only varies according to banks' characteristic differences in performance, but also exhibits some heterogeneity according to the level of regional economic development. International Monetary Fund (IMF, 2021) studies show that low- and middle-income countries are more affected by epidemics due to a lack of economic bailout capacity, especially in low-income countries. Kalkuhl and Wenz (2020) point out that low-income areas with poor infrastructure have a greater impact of epidemic risks. Noy (2009) shows that credit markets are well developed in the countries are more resilient to epidemic risk. Klomp (2014) further states that there is no significant impact on bank stability in developed countries, while emerging countries are more affected by epidemics. It has also been shown that bank credit behavior in developing countries was more significantly affected by the epidemic, especially the reduction of bank lending activities (Haider & Mohammad, 2022). There is a large gap between the economic development of different regions in China, especially the large difference in the degree of development

between the central and western parts and the eastern part of the country, therefore, this study proposes Hypothesis 3b.

Hypothesis 3b: The impact of the epidemic on the behavior of bank credit asset structure allocation in regions with relatively low (high) levels of economic development in China may be greater (smaller).

Construction of Benchmark Regression Model

$$\text{Bank}_{i,t} = \alpha_0 + \alpha_1 \text{Bank}_{i,t-1} + \alpha_2 \text{Covid}_{r,t} + \sum_{n=3}^{6} \alpha_n X_{i,t-1} + \alpha_7 \text{Gap}_{r,t} + \alpha_8 M_2 + \alpha_9 \text{Area}_r + u_i + \lambda_t + \varepsilon_{i,t} \quad (3\text{-}1)$$

In equations 3-1, i represents the bank, t represents the specific year, and r represents the prefecture level city or provincial capital city where the head office of a local commercial bank is located. The dependent variable $\text{Bank}_{i,t}$ represents the credit asset structure allocation of individual bank i during period t. Due to the sustainability of bank credit asset structure allocation, there may be a potential dynamic impact between the previous bank credit asset structure allocation and the current bank credit asset allocation. Therefore, this study adopts a dynamic panel model, and the explanatory variables of the model include the first-order lag term of the dependent variable. $\text{Covid}_{r,t}$ is the epidemic indicator. $X_{i,t-1}$ represents the micro level control variables of banks. In order to reduce the endogeneity of the model, this study lags the control variables of commercial banks at the micro level by one period. At the macro level, the control variables are the local economic output gap $\text{Gap}_{r,t}$, and the broad money growth rate M_2. To control the impact of regional environment and other characteristics on bank credit asset allocation, this study also uses the Hu Huanyong Line Area_r as a regional feature control variable. λ_t is the annual time fixed effect, and $\varepsilon_{i,t}$ is the residual term.

In equations 3-1, to overcome the potential bias in estimating the dynamic panel model using the least squares method (OLS), this study uses the System Generalized Moments (SYS-GMM) method for estimation.

Variable Definition

Dependent Variable

$\text{Bank}_{i,t}$ is the dependent variable, namely the credit asset structure allocation of local commercial banks. The dependent variable aims to measure the credit asset allocation structure. This study uses different types of credit asset ratios to measure the allocation behavior of credit assets. Firstly, in terms of credit scale, this study uses the proportion of credit assets ($\text{Loan}_{i,t}$), which is the ratio of loans to total assets, to measure the changes in credit allocation of local commercial banks due to the impact of the epidemic. In terms of specific credit result classification, based on the loan classification disclosed in the annual report of Chinese commercial banks, it can be roughly classified according to loan objects, loan terms, credit asset structure, and investment industries. Based on the aforementioned theory, this study adopts a classification based on credit asset structure to examine the impact of the epidemic on mortgage loans of local commercial banks, and uses the ratio of mortgage loans to loans to measure the indicator $\text{Mort}_{i,t}$. And examine the impact of the epidemic on the industry structure configuration of local commercial banks that are susceptible to the epidemic by industry classification ($\text{Indus}_{i,t}$, i. e. the proportion of industries and loans that are susceptible to the epidemic). Based on existing theoretical research, industries that are susceptible to the epidemic have selected loans from agriculture, forestry, animal husbandry, sideline fisheries, accommodation and catering, retail, and transportation industries.

Core explanatory Variables

Since January 2020, the COVID-19 has gradually spread throughout the country, which coincides with the wave of New Year's Spring Festival travel. In addition to the people's lack of understanding of COVID-19 at the beginning and the lively atmosphere of the New Year, COVID-19 epidemic has had an opportunity to spread crazily among people. Therefore, this study takes the years before 2019 when there was no epidemic as 0 and the years after 2019 as 1.

Control Variables

The micro-level control variables reflecting bank characteristics are: bank asset size (Size, measured in natural logarithm), net interest margin level (Nim, reflecting the profitability of interest-earning assets), capital adequacy ratio (Car) The level of bank capital adequacy directly affects the bank's credit asset allocation behavior), and deposit ratio (Dep, reflecting the bank's liability structure). The control variables at the regional level are the output gap (Gap) and regional characteristics (Area) of the head office location, based on the Hu Huanyong line dividing the southeast and northwest regions. Money growth rate will have a large impact on bank credit behavior, and I control for broad money supply growth rate (M2) at the same time in this study. In addition, to control the impact of regional economic level and time effects, this study introduces year fixed effects (Yeareffects) to ensure the robustness of the results.

Based on data availability The analytical sample of this study includes unbalanced panel data of 281 local commercial banks in China from 2012 to 2023. Among them, the data of control variables, etc. come from the National Bureau of Statistics, wind database, and China Urban Statistical Yearbook, and the peripheral data come from China Bank Database (CBD), which covers the loan data of bank sub-industries, and is one of the largest databases in China in terms of sample coverage at present. In order to eliminate the influence of extreme values on the study, this study applies Winsorize shrinkage at the 1%-99% level for continuous variables.

Findings

Descriptive Statistic

The descriptive statistics of the main variables in this section are shown in Table 4.1. Table 4.1 shows that the minimum value of the proportion of credit in commercial banks is 21.27, and the maximum value is 74.09, indicating that there are large differences in the proportion of loans to total assets of Chinese commercial banks during the sample period. The commercial bank mortgage loans in this article mainly refer to the mortgage loans of local commercial banks, among which housing mortgage loans account for a small proportion. The minimum value is 5.81 and the maximum value is 86.86, indicating that there is a large difference between mortgage loans and loan ratios. The minimum value of the industry structure configuration of commercial banks that are vulnerable to the epidemic is 5.34, and the maximum value is 65.43, indicating that there are large differences in the proportion of industries and loans that are vulnerable to the epidemic. The indicator descriptions and descriptive statistics of each variable are reported in Table 4.1.

Table 4.1
Descriptive Statistics of Main Variables

Variable	Variable meaning	Observed value	Average value	Standard deviation	Minimum value	Maximum value
Loan	Percentage of credit	2540	49. 1544	10. 7476	21. 2775	74. 0894
Mort	Mortgages	952	44. 0749	16. 0207	5. 8104	86. 8596
Indus	Industries Affected by the Epidemic	564	27. 8169	12. 8078	5. 3445	65. 4311
Size	Asset size	2594	10. 1247	1. 3579	7. 4202	13. 5960
Car	Capital Adequacy Ratio	2213	13. 5290	3. 6289	2. 6000	29. 5800
Nim	Net interest margin	2007	2. 5514	1. 1039	0. 3603	5. 6012
Dep	Deposit ratio	2520	75. 8112	13. 3329	35. 3943	93. 8645
Area	Hu Huanyong Line	2630	0. 9331	0. 2499	0. 0000	1. 0000
Gap	Output gap	2520	0. 0291	1. 2516	-3. 1329	3. 2243
M2	Broad money growth rate	2630	13. 7322	4. 5910	8. 0700	28. 4200

Benchmark Regression Results

The regression results of the impact of the epidemic on the credit asset structure allocation of local commercial banks are shown in Table 4.2. The results show that the lagged first-order coefficients on the structural allocation of bank credit assets are significant, reflecting a certain dynamic continuity in the credit asset allocation of local commercial banks. Columns (1)-(3) of Table 4.2 examine the estimation results of epidemic on bank credit asset types. Column (1) shows that the effect of epidemic (Covid) on loan share is significantly negative, suggesting that local commercial banks shrink their loan assets as the frequency of epidemic enhances. The reason may lie in the fact that epidemics raise bank risk, while bank loans are the highest and most important asset business among bank assets, and the risk-weighted coefficient is the highest among all assets, when the bank faces the risk brought about by external shocks of epidemics, for the sake of risk aversion, the local commercial banks will have the intention to reduce the risky asset holdings, and thus shrink the credit scale. Column (2) of Table 4.2 examines the estimated impact of the epidemic (Covid) on the business structure of banks' collateralized lending, and the results show that the impact of the epidemic on the share of collateralized lending is also significantly negative, and that the epidemic significantly suppresses local commercial banks' collateralized lending. The possible reason for this is that collateral depreciation becomes the core of the epidemic-related risks affecting bank credit, and the epidemic will affect their balance sheets through the damage and depreciation of the value of households' and firms' collateral, which in turn affects debt-servicing capacity and leads to elevated bank risk. Further, commercial banks hedge their credit assets by adjusting the credit structure of their loans. Column (3) of Table 4.2 presents the results of commercial banks' credit allocation to epidemic-prone industries in response to the epidemic, and the results similarly show that the epidemic significantly reduces the allocation of local commercial banks' credit structure to epidemic-prone industries, this is because epidemics can directly affect the vulnerable industries and pose risks to banks, which in turn will make adjustments to their credit in such industries. In the estimation results in Table 4. 2, AR(2) are all greater than 0. 1, indicating that the original hypothesis that there is

no serial correlation of second or higher order in the disturbance term cannot be rejected, and the p-values of Hansen's statistic all pass the test, indicating that there is no over-identification, and thus the estimation of the dynamic panel is valid, verifying Hypothesis 4. This finding suggests that epidemics affect the structural allocation of credit assets of local commercial banks in China. This finding suggests that the epidemic in China affects the structural allocation of credit assets of local commercial banks.

Table 4.2
Benchmark regression results on the impact of the epidemic on banks' credit asset structure allocation

Variable	Loan	Mort	Indus
L. Loan	0. 819***		
	(0. 052)		
L. Mort		-0. 179***	
		(0. 048)	
L. Indus			0. 532***
			(0. 077)
Covid	-0. 521***	-0. 345**	-0. 478**
	(0. 120)	(0. 143)	(0. 226)
L. Size	-0. 469	-7. 321***	-2. 529***
	(0. 436)	(0. 987)	(0. 809)
L. Car	-0. 059	-1. 043***	-0. 431**
	(0. 116)	(0. 303)	(0. 207)
L. Nim	-1. 033**	-2. 329**	-0. 942
	(0. 410)	(0. 992)	(0. 939)
L. Dep	0. 067	-0. 206**	-0. 004
	(0. 047)	(0. 084)	(0. 065)
M2	-0. 185***	-0. 221*	-0. 283**
	(0. 041)	(0. 141)	(0. 120)
Gap	-0. 244	-0. 035	-0. 005
	(0. 167)	(0. 324)	(0. 293)
Area	0. 369	5. 856**	0. 921
	(0. 715)	(2. 475)	(2. 389)
Bankeffects	YES	YES	YES
Yeareffects	YES	YES	YES
N	1388	501	385
AR(2)	0. 136	0. 614	0. 209
Hansenp	0. 127	0. 460	0. 864

Note: (1) The dependent variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, below.

Robustness Testing

Replacing the Sample Period

The sample period of the benchmark regression in this study is 2012-2023, and the sample period is too long may affect the robustness of the empirical results of the benchmark model.

For this reason, in this part of the robustness test, this study firstly excludes the sample of 2012-2015 and does further regression test on the data sample of 2016-2023. The robustness results are shown in Table 4.3, and the sample period does not affect the robustness of the benchmark results.

Table 4.3
Replacement Sample Interval Regression Results

Variable	Loan	Mort	Indus
L. Loan	0. 822***		
	(0. 052)		
L. Mort		-0. 192***	
		(0. 049)	
L. Indus			0. 533***
			(0. 077)
Covid	-0. 517***	-0. 438***	-0. 460**
	(0. 113)	(0. 153)	(0. 224)
ControlVal	YES	YES	YES
Bankeffects	YES	YES	YES
Yeareffects	YES	YES	YES
N	1388	501	385
AR(2)	0. 134	0. 556	0. 220
Hansenp	0. 123	0. 588	0. 871

Note: (1) The dependent variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, below.

Replacement of Dependent Variables

In order to verify the robustness of the results, this study refers to the study of Liu Liya et al. (2021), and in order to reflect the preference of credit asset allocation, the degree of change in the growth rate of credit assets, mortgage-type loans, and loans in industries susceptible to epidemics are used as proxies for measuring the share of various types of credit assets of local commercial banks to conduct a robustness test of the benchmark model. The regression results are presented in Table 4.4. The estimation results in Table 4.4 show that the variables of credit asset share, mortgage-type loan asset share, and credit asset share of epidemic-susceptible industries are replaced with the growth rate of credit asset (gLoan), the growth rate of mortgage-type loan asset (gMort), and the growth rate of credit asset in epidemic-susceptible industries (gIndus). As the results in Table 4. 4 shows, replacing the dependent variables does not change the results of the impact of the epidemic on the structural allocation of credit assets of local commercial banks, and replacing the dependent variables likewise does not affect the robustness of the benchmark results.

Table 4.4
Results of Regression with Replacement of Dependent Variable

Variable	gLoan	gMort	gIndus
L. gLoan	0. 558***		
	(0. 057)		
L. gMort		-0. 924***	
		(0. 298)	
L. gIndus			-0. 322***
			(0. 088)
Covid	-0. 028*	-0. 343*	-0. 073*
	(0. 014)	(0. 192)	(0. 043)
ControlVal	YES	YES	YES
Bankeffects	YES	YES	YES
Yeareffects	YES	YES	YES
N	1243	300	215
AR(2)	0. 274	0. 351	0. 125
Hansenp	0. 128	0. 459	0. 259

Note: (1) The explanatory variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, below.

A Mechanistic Test of the Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

The aforementioned theoretical analysis shows that when faced with the external shock of the epidemic, the loss of corporate and household assets and the decline in the value of collateralized assets damage the balance sheet and reduce their repayment ability, leading to an increase in the ratio of non-performing loans of the bank, forcing the bank to consciously and actively provide for more loan loss provisions, and the bank's provisioning of loan loss provisions leads to an adjustment in the allocation of the bank's credit assets. Therefore, the epidemic affects commercial banks' credit asset allocation through the channel of increasing loan loss provisions. In order to verify whether this channel of influence exists, this study refers to the stepwise test method of Baron and Kenny (1986) to construct the following mediation effect test model to examine the mechanism of the epidemic affecting the adjustment of banks' asset structure allocation through influencing commercial banks' loan loss provision:

$$\text{Llr}_{i,t} = \delta_0 + \delta_1 \text{Llr}_{i,t-1} + \delta_2 \text{Covid}_{r,t} + \sum_{n=3}^{6} \delta_n X_{i,t-1} + \delta_7 \text{Gap}_{r,t} + \alpha_8 \text{Area}_r + u_i + \lambda_t + \varepsilon_{i,t}$$

(4-1)

$$\text{Bank}_{i,t} = \gamma_0 + \gamma_1 \text{Bank}_{i,t-1} + \gamma_2 \text{Llr}_{i,t} + \gamma_3 \text{Covid}_{r,t} + \sum_{n=4}^{7} \gamma_n X_{i,t-1} + \delta_8 \text{Gap}_{r,t} + \alpha_9 \text{Area}_r + u_i + \lambda_t + \varepsilon_{i,t}$$

(4-2)

Where the mediating variable (Llr) is the bank loan loss reserve, which is expressed using the ratio of loan loss reserve to total loans. According to the principle of stepwise test method, this study focuses on the significance of the coefficients in equations 4-1 and 4-2. When the coefficients d_2, g_2, and the coefficient α_2 in equation 3-1 are significant, and the coefficients

become smaller or less significant, it means that the mediation effect exists. If at least one of them is not significant, the Sobel test is required to determine the existence of the mediating effect.

Table 4.5 reports the regression results of the channel test for the impact of the epidemic on banks' asset allocation. Epidemics have been shown in equation 4-1 to significantly change the structural allocation behavior of banks' credit assets. Epidemics can significantly reduce the share of credit assets, the share of collateralized loans, and the share of loans in industries affected by epidemics in local commercial banks through the channel of higher loan loss provisions. The regression results in columns (1), (3), and (5) in Table 4. 5 shows that the regression coefficients of loan loss provision (Llr) are significantly positive, indicating that the higher the frequency of recurring epidemics, the higher the bank's provision for loan losses. The results in columns (2), (4), and (6) in Table 4.5 show that loan loss provisioning reduces the share of credit in bank assets, and also reduces the share of collateralized loans in credit and the share of loans in industries susceptible to the epidemic. The above results indicate that there is a transmission channel of epidemic - loan loss provision - bank credit asset allocation in the process of epidemic's impact on the structural allocation of commercial banks' credit assets. As a result, hypothesis 2 is verified.

Table 4.5
Regression Results of the Channel Test for the Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

Variable	Llr	Loan	Llr	Mort	Llr	Indus
	(1)	(2)	(3)	(4)	(5)	(6)
L. Llr	0. 642***		0. 642***		0. 642***	
	(0. 048)		(0. 048)		(0. 048)	
L. Loan		0. 695**				
		(0. 047)				
L. Mort				-0. 130*		
				(0. 062)		
L. Indus						0. 758***
						(0. 049)
Llr		-0. 685*		-1. 290		-0. 952*
		(0. 402)		(0. 761)		(0. 579)
Covid	0. 079***	-0. 025	0. 079***	-0. 138	0. 079**	-0. 231
	(0. 030)	(0. 057)	(0. 030)	(0. 439)	(0. 030)	(0. 187)
ControlVal	YES	YES	YES	YES	YES	YES
Bankeffects	YES	YES	YES	YES	YES	YES
Yeareffects	YES	YES	YES	YES	YES	YES
N	1141	1206	1141	460	1141	350
AR(2)	0. 605	0. 247	0. 605	0. 229	0. 605	0. 395
Hansenp	0. 353	0. 313	0. 353	0. 841	0. 353	0. 800

Note: (1) The explanatory variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, below.

Heterogeneity Analysis of the Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

Heterogeneity Analysis Based on Bank Characteristics

Based on the previous theoretical analysis, it is shown that the impact of the epidemic on the credit asset structure allocation of small and medium-sized local commercial banks with lower levels of capital adequacy and liquidity will be greater relative to local commercial banks with larger size and higher levels of capital adequacy and liquidity. Individual differences in bank characteristics such as bank size, capital adequacy level and liquidity level all affect banks' credit asset structure allocation, therefore, this study investigates the active allocation behavior of commercial banks' credit asset structure under different micro characteristics by grouping them. To this end, with reference to the related study of Liu et al. (2021), this study categorizes size, capital adequacy and liquidity levels by their median, and those located above the median indicate larger banks with higher size, capital adequacy and liquidity levels, and vice versa correspond to small-sized, low-capital-adequate and low-liquidity banks, respectively.

Tables 4.6, 4.7 and 4.8 examine the estimated results of the heterogeneity of the epidemic on the structural allocation of credit assets of commercial banks with different bank sizes, capital adequacy and liquidity levels, respectively, and the results indicate that the impact of the epidemic on the banks' credit asset allocation is not the same due to the differences in the banks' own micro characteristics. The results in Table 4.6 indicate that compared to large-scale local commercial banks, small-scale commercial banks will have stronger behavior in proactively adjusting the structure of loan assets, mortgage-type loans and industry loans in the face of the epidemic, which is due to the fact that larger banks have a more diversified asset business, a more mature credit business, and a relatively higher awareness of coping with the epidemic risk, and a relatively stronger ability to resist the epidemic risk, on which there is no need to On this basis, they do not need to proactively adjust their credit asset structure allocation. In order to examine the impact of the epidemic on the credit asset allocation of commercial banks with different capital adequacy levels, this study conducts a test on capital adequacy levels in groups. The test results are shown in Table 4.7.

The results in Table 4.7 suggest that undercapitalized local commercial banks actively reduce the size of their loans, mortgage loans, and sectoral loans compared to more adequately capitalized local commercial banks. This is because more well-capitalized banks, facing the shock of epidemic risk, may not fall below the capital regulatory requirement even after making more loan loss provisions; even if they fall below the capital regulation, they can get capital replenishment quickly. In the face of epidemic risk, their level of risk appetite does not change significantly, and the impact on loan size, collateralized lending, and sectoral lending is not large. The results in Table 4.8 show that the credit behavior of local commercial banks with lower liquidity levels is significant, and they are relatively proactive in adjusting their credit asset allocation structure. This is due to the fact that banks with higher liquidity levels have more stable asset-liability capacity, which can increase the ability of banks to bear risks, and may have relatively less incentive to adjust the structure of bank credit allocation. Thus, all of the above results suggest that the credit asset restructuring of small, low capital adequacy and liquidity level banks is more sensitive to the impact of the epidemic than that of large, well-capitalized and liquidity level banks. As a result of the epidemic, the size of loans

of such local commercial banks declined, as did mortgage loans and credit to industries affected by the epidemic, thus validating Hypothesis 3a.

Table 4.6
Regression Results of the Channel Test for the Impact of the Epidemic on the Structural Allocation of Bank Credit Assets

Variable	Loan	Loan	Mort	Mort	Indus	Indus
	(1)	(2)	(3)	(4)	(5)	(6)
L. Loan	0. 870***	0. 459***				
	(0. 048)	(0. 102)				
L. Mort			-0. 095	0. 942***		
			(0. 127)	(0. 131)		
L. Indus					0. 829***	)850
					(0. 074)	(0. 152)
Covid	-0. 009	-0. 547***	-0. 270	-1. 262***	-0. 066	-0. 018
	(0. 145)	(0. 183)	(0. 343)	(0. 446)	(0. 265)	(0. 354)
ControlVal	YES	YES	YES	YES	YES	YES
Bankeffects	YES	YES	YES	YES	YES	YES
Yeareffects	YES	YES	YES	YES	YES	YES
N	988	400	445	56	353	32
AR(2)	0. 306	0. 802	0. 424	0. 141	0. 248	0. 477
Hansenp	0. 168	0. 231	0. 401	0. 994	0. 696	0. 854

Note: (1) The explanatory variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively, as below.

Table 4.7
Heterogeneity Results of the Epidemic on the Structural Allocation of Credit Assets of Banks of Different Sizes

Variable	Loan	Loan	Mort	Mort	Indus	Indus
	(1)	(2)	(3)	(4)	(5)	(6)
L. Loan	0. 558***	0. 688***				
	(0. 056)	(0. 095)				
L. Mort			0. 125	0. 279***		
			(0. 211)	(0. 045)		
L. Indus					0. 378*	0. 679***
					(0. 210)	(0. 048)
Covid	-0. 254	-0. 471***	-0. 636	-0. 340*	-0. 452	-0. 324**
	(0. 163)	(0. 148)	(0. 611)	(0. 184)	(0. 420)	(0. 132)
ControlVal	YES	YES	YES	YES	YES	YES
Bankeffects	YES	YES	YES	YES	YES	YES
Yeareffects	YES	YES	YES	YES	YES	YES
N	694	674	203	293	167	217
AR(2)	1	0. 229	0. 888	0. 192	0. 467	0. 056
Hansenp	0. 220	0. 102	0. 673	0. 573	0. 348	0. 997

Note: (1) The explanatory variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively, as below.

Table 4.8
Heterogeneity results of the epidemic on the structural allocation of banks' credit assets at different liquidity levels

Variable	Loan	Loan	Mort	Mort	Indus	Indus
	(1)	(2)	(3)	(4)	(5)	(6)
L. Loan	0. 860***	0. 698***				
	(0. 052)	(0. 103)				
L. Mort			0. 101	0. 093		
			(0. 135)	(0. 060)		
L. Indus					0. 513***	0. 459***
					(0. 112)	(0. 059)
Covid	-0. 007	-0. 677***	-0. 150	-0. 688**	-0. 027	-0. 434**
	(0. 143)	(0. 176)	(0. 513)	(0. 332)	(0. 242)	(0. 206)
ControlVal	YES	YES	YES	YES	YES	YES
Bankeffects	YES	YES	YES	YES	YES	YES
Yeareffects	YES	YES	YES	YES	YES	YES
N	593	660	221	244	166	202
AR(2)	0. 155	0. 309	0. 693	0. 691	0. 583	0. 897
Hansenp	0. 340	0. 113	0. 435	0. 840	0. 930	0. 533

Note: (1) The explanatory variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the second-order autocorrelation test, which is a statistically inferred p-value, and the p-values of Hansen's statistic all pass the test, suggesting that there is no over-identification; and (4) Standardized coefficients of each variable are shown in parentheses under the coefficients error, *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, below.

Heterogeneity Analysis Based on the Region where the Bank is Located

According to the aforementioned theoretical analysis, relative to less economically developed regions, due to the higher level of economic development, regions with a higher level of economic and financial relief capacity to adapt to the epidemic, a stronger awareness of the epidemic risk, as well as a higher level of insurance protection. Therefore, the ability of more economically developed regions to cope with epidemic risks is relatively stronger, and accordingly, the impact of the epidemic on the structural allocation of credit assets of commercial banks in more economically developed regions may be smaller. The impact of epidemics on banks' credit structure allocation behavior may be somewhat heterogeneous depending on the degree of regional economic development. However, there is a large gap in the level of economic development in different regions of China, and thus there may also be significant heterogeneity in the impact of epidemics on the structural allocation of bank credit assets in different regions.

In order to examine the regional heterogeneity of the impact of the epidemic on the credit asset structure allocation behavior of local commercial banks, this study is divided into east, middle and west regions according to the cities where the headquarters of local commercial banks in the sample are located, with the east representing the economically developed regions and the middle and west being the relatively underdeveloped regions, and the regression test is conducted in groups according to Eq. 3-2. The eastern region includes 11 provinces and autonomous regions including Tianjin, Shanghai, Beijing, Liaoning, Zhejiang, Hebei, Jiangsu, Shandong, Fujian, Guangdong, and Hainan, and the rest of the provinces and autonomous regions are the central and western regions.

The results are shown in Table 4.9, where columns (1) to (3) show the regression results of the epidemic on the allocation of bank credit assets in the central and western regions, and columns (4) to (6) show the regression results of the epidemic on the structural allocation of bank credit assets in the eastern region. The results show that the impact of the epidemic on the structural allocation of bank assets in the central and western regions is more obvious than that in the eastern region of China. The possible reason is that the central and western regions of China are limited by factors such as the level of economic development, the level of prevention and control is relatively low, and the awareness of epidemic risk perception is relatively weak, coupled with the relatively weak level of insurance protection, resulting in the central and western regions of the banking business by the impact of the epidemic may be greater. Therefore, compared to the eastern region, with the increase in the intensity of the epidemic, the impact of the epidemic on the risk of local commercial banks in the central and western regions of China will be greater. Accordingly, local commercial banks in the central and western regions will show more pronounced proactive adjustment behaviors in their conscious allocation of loans, mortgage-type loans, and loan allocations in industries vulnerable to the epidemic, thus verifying Hypothesis 3b.

Table 4.9
A Test of the Impact of the Epidemic on Regional Heterogeneity in the Structural Allocation of Bank Credit Assets

Variable	Loan	Mort	Indus	Loan	Mort	Indus
	(1)	(2)	(3)	(4)	(5)	(6)
L. Loan	0. 752***			0. 888**		
	(0. 059)			(0. 044)		
L. Mort		0. 023			0. 191	
		(0. 083)			(0. 114)	
L. Indus			0. 516**			0. 525***
			(0. 077)			(0. 134)
Covid	-0. 412*	-0. 946*	-0. 341*	-0. 122	-0. 006	-0. 584
	(0. 184)	(0. 543)	(0. 200)	(0. 084)	(0. 477)	(0. 389)
ControlVal	YES	YES	YES	YES	YES	YES
Bankeffects	YES	YES	YES	YES	YES	YES
Yeareffects	YES	YES	YES	YES	YES	YES
N	648	195	166	774	309	219
AR(2)	0. 315	0. 504	0. 566	0. 495	0. 849	0. 079
Hansenp	1	0. 990	0. 963	1	0. 776	0. 421

Note: (1) The explanatory variables are all lagged by one item; (2) Bankeffects and Yeareffects denote individual bank effects and year fixed effects, respectively; (3) AR(2) stands for the

second-order autocorrelation test, which is a statistically inferred p-value, and the p-values for the Hansen statistic all pass the test, indicating that there is no over-identification; and (4) Standardized in parentheses under the coefficients of the variables are standard error, *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively.

Summary, Conclusions and Recommendations

This study combines theoretical analyses with unbalanced panel data on Chinese epidemics and local commercial banks to investigate the impression of epidemics on the structural allocation of credit assets of local commercial banks, and tests the mechanism by which epidemics affect the structural allocation of banks' credit assets through the channel of loan loss provisioning, as well as examining the heterogeneity of the effects of epidemics and the structural allocation of bank credit assets due to differences in the individual characteristics of banks and the degree of regional economic development. The results of the empirical study show that. The empirical findings show that:

First, the epidemic changed the structural allocation of credit assets of local commercial banks. The study found that the epidemic suppressed the size of banks' credit asset structure, and at the same time reduced the structural allocation of credit assets to collateralized assets and industries susceptible to the epidemic. First, the reduction in the size structure of credit assets stems from the fact that banks actively reduce risky assets out of risk aversion under the impact of the epidemic. Second, the decrease in collateralized assets was due to the shrinking value of collateral due to the epidemic, and banks therefore reduced the proportion of such assets. Finally, credit sector restructuring is mainly due to economic losses in certain sectors as a direct result of the epidemic, thus increasing bank risk.

Second, epidemic risk affects banks' credit asset allocation mainly by increasing their loan loss provisions. Using a mediated effects model, this chapter finds that epidemics significantly increase the loan loss provisions of local commercial banks, which in turn suppresses credit size, collateralized assets, and loan placement in industries affected by epidemics. This is because loan loss provisions reduce bank capital, leading to lower capital adequacy ratios and banks reducing assets in risk classes affected by the epidemic.

Third, epidemic risk has a greater impact on the structural allocation of credit assets of small, local commercial banks with lower capital adequacy levels and liquidity, and banks in less developed regions are more significantly affected by the epidemic. The reason for this is that larger banks with diversified businesses are more resilient to overall risk even when faced with the impact of the epidemic, while small-sized banks are more affected by the epidemic and have a weaker ability to resist risk. In terms of capital adequacy, banks with higher capitalization levels face little change in their capital when facing the impact of the epidemic, and their credit asset structure allocation is less affected; on the contrary, banks with lower capitalization levels are more susceptible to the impact of the epidemic. Banks with higher liquidity levels are better able to cope with the risks brought by the epidemic, thus reducing the adjustment of credit asset structure allocation.

Based on the findings of this study, the following recommendations are proposed: First, commercial banks should optimize credit allocation by reducing lending to severely impacted industries (e.g., tourism, food and beverage) while increasing support for sectors with strong

recovery potential in response to the effects of the epidemic. They should also establish special low-interest loan programs and extend repayment periods to assist small and medium-sized enterprises (SMEs) in overcoming financial difficulties. Additionally, banks should expand non-interest income streams (e.g., wealth management and fintech partnerships) to reduce dependence on traditional credit. Furthermore, they should replenish capital through debt issuance, optimize asset-liability structures, and ensure adequate liquidity. Second, banking regulators should consider the specific service roles of local commercial banks, particularly by implementing differentiated supervision for agricultural and commercial banks in less developed regions to promote agricultural credit investment. Additionally, they should relax non-performing loan (NPL) tolerance for industries severely affected by the epidemic, such as agriculture and manufacturing. Third, central bank policies should be leveraged to support affected industries and regions while improving access to credit for SMEs and the agricultural sector.

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