The Theoretical Correlation Between Bank Credit Expansion and Financial Vulnerability

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Abstract. The theoretical link between bank credit expansion and financial vulnerability is explored in this paper. The study shows that during economic booms, banks often over-expand credit scale, which, while promoting economic growth in the short term, also accumulates systemic financial risks. The article first reviews key theoretical frameworks such as Minsky's financial instability hypothesis and the financial accelerator theory and analyzes the micro drivers and macro environmental factors of bank credit expansion, and then constructs theoretical models to reveal the intrinsic linkage mechanism between bank credit expansion and asset price fluctuations, rising leverage ratios, maturity mismatch, and liquidity risk. The study also shows that bank credit expansion alters the balance sheet structure of economic entities, increases the interconnectivity and complexity of the financial system, and thereby raises financial vulnerability. Finally, the article discusses counter-cyclical adjustment mechanisms within the macroprudential policy framework and the role of regulatory tools such as capital adequacy ratios and liquidity coverage ratios in curbing excessive credit expansion, and puts forward policy recommendations such as improving the financial regulatory system, optimizing the credit structure, and strengthening the risk early warning mechanism in the hope of finding a balance between promoting economic growth and maintaining financial stability.

Keywords: Bank credit expansion; Financial vulnerability; Systemic risk; Financial cycles; Macroprudential policy.

1. Introduction

The modern financial system operates on the core mechanism of bank credit expansion, which is also an important driver of economic growth. However, after the 2008 global financial crisis, academics and policymakers have focused extensively on the intrinsic link between excessive bank credit expansion and financial vulnerability. Data from the China Banking and Insurance Regulatory Commission shows that by the end of 2022, the total assets of China's banking financial institutions reached 380.1 trillion yuan, an increase of 39.7 percent from 2018, and the credit scale has been expanding. Although the non-performing loan ratio is below 2 percent and is at a relatively controllable level, potential risks have been accumulating, especially in real estate and local government debt.

Minsky's financial instability hypothesis suggests that credit expansion during economic booms increases the vulnerability of the financial structure and eventually leads to economic recession, so this paper aims to explore the theoretical correlation mechanism between bank credit expansion and financial vulnerability. To analyze the process of bank credit creation, the drivers, and the impact of monetary policy on it, and to examine the manifestations of financial vulnerability and its interaction with credit expansion, so as to provide theoretical support for building a more robust financial regulatory system.

2. The theoretical basis of bank credit expansion

2.1 Bank credit creation mechanism

In the process of taking in deposits and granting loans, commercial banks have the ability to generate credit money beyond the original deposit scale. This is bank credit creation. In the modern fractional reserve system, commercial banks only need to retain a portion of deposits as reserves, and the remainder can be used to issue loans, and these loans will become new deposits, thereby achieving

multiple expansion of money. By June 2023, China's broad money supply (M2) stood at 286.2 trillion yuan, up 11.3% year-on-year, while nominal GDP growth was far less than that during the same period, demonstrating the strong credit creation capacity of the banking system, according to the People's Bank of China.

The bank credit creation mechanism is essentially a leveraged process, and the key lies in the expansion of the bank's balance sheet, because when banks extend loans to customers, they record loan assets on the asset side and derivative deposits on the liability side. This not only increases their own balance sheet size, but also increases the total credit volume of the entire economic system, and in recent years, with the rise of financial innovation, Banks have further enhanced their credit expansion capabilities through means such as asset securitization and shadow banking, thereby constantly expanding the boundaries of credit creation and the scope of influence.

2.2 Drivers of credit expansion

Multiple factors drive bank credit expansion. At the micro level, the intrinsic motivation of banks to maximize profits plays a key role [2] in driving it. According to the "China Banking Development Report (2023)" released by the China Banking Association, the net interest margin of Chinese commercial banks was 1.91% in 2022 (2.25% in 2018). Under pressure on profits, banks tend to expand their business scale in order to maintain profit levels. And the increasingly fierce competition among banks, all vying for market share, has made banks' credit lending strategies more aggressive.

Among macro-environmental factors, economic growth expectations, regulatory policies and monetary policy orientation have a significant impact on bank credit expansion behavior. When the economy is good, bank risk appetite rises and lending standards become looser; when the situation is bad, the opposite is true, according to research by the Institute of Finance of the Chinese Academy of Social Sciences. In 2019-2023, there is a significant positive correlation between bank lending and GDP growth expectations, and banks are more willing to expand credit when the economy is on the rise. In addition, the tightness or loosenness of regulatory policies directly affects bank credit behavior. For example, during the pandemic in 2020, regulatory authorities introduced many policies to encourage banks to lend more, which led to a rapid increase in bank credit scale.

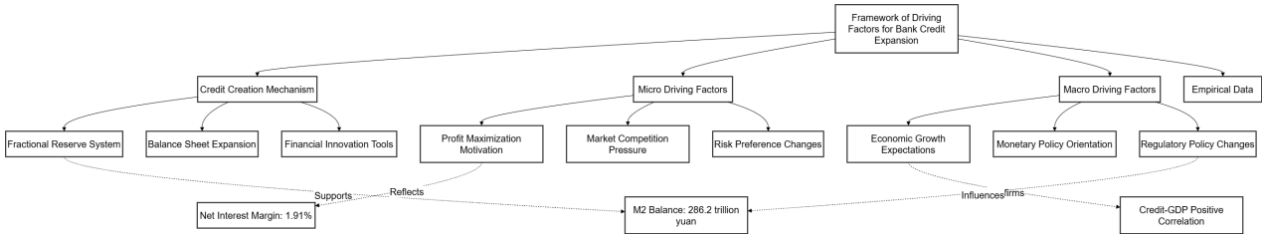

Figure 1. Framework of Driving Factors for Bank Credit Expansion

2.3 Relationship between Monetary Policy and credit expansion

Bank credit expansion is influenced by the important external factor of monetary policy. The central bank uses policy tools such as adjusting the benchmark interest rate, the reserve requirement ratio, and open market operations to influence the cost of funds and the amount of loanable funds of banks, thereby influencing credit creation capacity. Under the traditional monetary policy transmission mechanism, loose monetary policy can prompt banks to expand credit by lowering financing costs and increasing liquidity, while tight monetary policy does the opposite. Since 2020, the People's Bank of China has implemented a prudent monetary policy, repeatedly lowering the reserve requirement ratio and the loan prime rate (LPR), creating favorable conditions[3] for bank credit expansion.

Monetary policy has a non-linear impact on credit expansion because even if monetary policy is loose during economic downturns, banks may be reluctant to lend more due to increased risk aversion, which could lead to a "liquidity trap", and structural problems in the financial system can impede the

monetary policy transmission mechanism and make the policy less effective. Data from the Research Bureau of the People's Bank of China shows that China's social financing scale increased by 32 trillion yuan in 2022. Although monetary policy remained loose, the growth rate was significantly slower compared with 2021, which reflects the complex relationship between monetary policy and credit expansion.

It should be noted that traditional monetary policy tools' ability to regulate credit expansion is challenged at a time when financial innovation and Internet finance are developing rapidly, as credit creation activities by new entities such as non-bank financial institutions and fintech companies are becoming more active and some are not within the traditional regulatory framework, which makes the relationship between monetary policy and credit expansion more complex.

3. The Formation and Manifestation of Financial vulnerability

3.1 Definition of Financial vulnerability

Financial Fragility (financial Fragility) indicates the lack of stability and resilience of the financial system in the face of uncertainty and is the intrinsic basis[4] for the outbreak of systemic financial risks. According to the International Monetary Fund (IMF), financial fragility is characterized by imbalances in the balance sheet structure of financial institutions, lack of market liquidity, excessive risk appetite among financial market participants, and close interconnections among financial institutions. Research released by the China Finance Society shows that China's financial vulnerability index has generally risen in a fluctuating manner from 2019 to 2023. Financial vulnerability has intensified under the influence of factors such as the adjustment of the real estate market, increased local debt pressure, and fluctuations in the global financial market, but is still within a manageable range overall.

3.2 Accumulation mechanisms of systemic risk

The process of systemic risk accumulation is often covert and gradual. At the micro level, individual financial institutions often underestimate long-term risks to gain short-term benefits, resulting in "catastrophic forgetting", and as economic booms continue, financial institutions' risk appetite rises, lending standards are gradually relaxed, and risk pricing is inadequate. This eventually leads to a build-up of high-risk assets in the financial system, according to the China Banking and Insurance Regulatory Commission's risk monitoring data. During the period from 2020 to 2022, the growth rate of risk-weighted assets in China's banking sector was faster than that of total assets, indicating a stronger[5] risk appetite in banks.

Macroscopically, the mutual reinforcement mechanism within the financial system is a manifestation of systemic risk accumulation. First of all, leverage ratios are pro-cyclical. When the economy is on the upswing, leverage ratios rise, and when it is on the downswing, leverage ratios fall, amplifying economic volatility. Secondly, there is risk contagion among financial institutions, with risks spreading through direct exposure and indirect price impact channels, according to a 2022 study by the Institute of Finance of the Chinese Academy of Social Sciences, the degree of interconnections within China's banking system has been increasing and the channels of cross-market risk contagion have become more diverse, which has expanded the potential impact range of systemic risks. In addition, there is a time lag between monetary policy and financial regulatory policy, and if the two are not coordinated, it will also contribute to the accumulation[6] of systemic risks.

3.3 Asset Price Bubbles and credit Cycles

There is a close interaction between asset price bubbles and the credit cycle, which is called the "financial accelerator" mechanism. When the economic situation improves, the increase in asset prices raises the net asset value and collateral value of borrowers and enhances their financing capacity, so banks expand credit supply, and as credit expands, asset prices are further pushed up. This creates a positive feedback loop. Data from the Financial Stability Bureau of the People's Bank

of China shows that the correlation coefficient between housing prices in China's first-tier cities and the scale of new housing loans was 0.87 from 2019 to 2021, indicating the strong interaction between credit and asset prices.

Generally speaking, the economic cycle is shorter than the financial cycle, and the combined fluctuations of credit scale, asset prices and risk appetite are manifestations of the financial cycle. In the upswing phase, financial institutions loosen credit standards, causing the leverage ratios of enterprises and households to rise and asset prices to rise rapidly, but once the cycle enters the downswing phase, Credit tightening, deleveraging and falling asset prices reinforce each other and may trigger a severe recession. In recent years, the characteristics of China's financial cycle have become increasingly prominent. Research by the National Institute of Finance and Development shows that China's financial cycle fluctuates for about 8 to 10 years, longer and more volatile than the traditional economic cycle of 3 to 5 years.

It should be noted that when asset price bubbles form, the credit structure often changes as credit resources flood into assets such as real estate and the stock market rather than productive investments in the real economy, resulting in a "de-real to virtual" situation. Data from the China Banking and Insurance Regulatory Commission shows that by June 2023, the balance of real estate-related loans in China accounted for 27.4% of the total loans in the banking sector. Although it has dropped from its peak, the proportion is still considerable, indicating that the allocation efficiency of credit resources needs to be optimized [7].

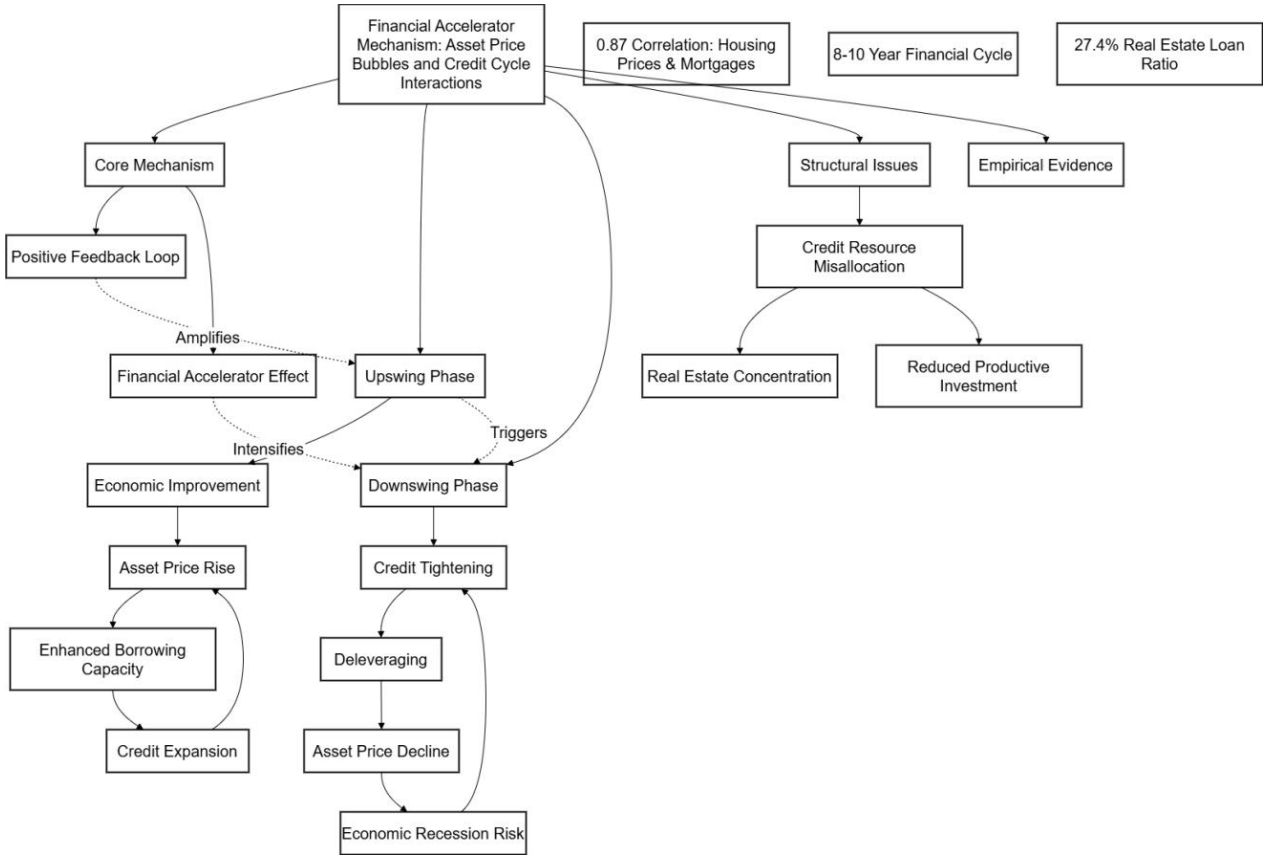

Figure 2. Financial accelerator Mechanism: Interaction between Asset Price Bubbles and Credit Cycles

4. Theoretical Correlation between Credit Expansion and Financial Vulnerability

4.1 Perspective of Minsky's Financial Instability Hypothesis

Hyman Minsky's financial instability hypothesis provides an important theoretical framework for understanding the intrinsic link between bank credit expansion and financial fragility, according to which the financial system gradually shifts from stability to fragility during prosperous times, which is an inherent characteristic of the financial system. And Minsky divides the financing behavior of economic units into three categories, namely Hedge financing, Speculative financing and Ponzi financing, when the economy is ina boom phase, banks will keep easing lending standards. As a result, the financing structure gradually shifts from the relatively stable hedging type to the riskier speculative and Ponzi types.

The latest Financial stability report indicates that the ratio of private sector debt to GDP in major global economies rose by an average of about 23 percentage points between 2019 and 2023, and this rapid credit expansion is in line with the Minsky hypothesis. The large amount of credit issued by China's banking sector in 2020, which supported the economic recovery in the short term, also pushed up the prices of risky assets and turned the financing structure of some enterprises and households from hedging to investment, thus creating a cycle of "accumulation of financial fragility - financial instability - economic recession", proving that Minsky's theory is applicable in reality. And when the proportion of speculative and Ponzi financing in the system increases, the sensitivity of the entire financial system to external shocks increases accordingly.

4.2 Excessive credit and balance sheet Effects

The link that affects the balance sheets of economic entities from excessive credit expansion is the key link between credit expansion and financial vulnerability. When banks expand credit on a large scale, businesses and households often want to leverage up, thereby deteriorating the balance sheet structure. When there are negative shocks, these highly leveraged economic entities have no choice but to adjust and deleverage, often selling assets to pay off debts and causing asset prices to fall, making the balance sheet situation worse and creating a vicious cycle [8].

Data shows that during 2020-2023, China's household sector leverage rose from 61.7% to 63.2% and corporate sector leverage increased from 159.2% to 163.1%. In this process of debt accumulation, the potential risk of the balance sheet effect increases significantly because once asset prices fall, The risk exposure in China's real estate sector in 2022 is a typical example of the amplification of financial vulnerability caused by the balance sheet effect, where borrowers' net assets would decrease and credit constraints would tighten, forcing them to cut spending and investment, thus further expanding the impact of the initial shock. At that time, developers were trapped in a vicious cycle of falling asset values, restricted financing, having to sell at lower prices, and further depreciation of assets, which posed a serious challenge to the stability of the entire financial system.

4.3 Financial accelerator mechanism

Bernanke, Gertler, and Gilchrist put forward the theory of financial accelerators, which explains how initial economic shocks are amplified and spread when financial markets are imperfect. The core of the mechanism lies in the interaction between credit market frictions and the real economy cycle, and bank credit expansion plays a key role in this. When the economy is in a boom phase, the increase in corporate net worth and the value of collateral will relax bank credit conditions and lower the cost of funds, thereby stimulating more investment and consumption behavior to further boost the economy.

Financial vulnerability has also been accumulating in this process. Statistics from the China Banking and Insurance Regulatory Commission show that the credit scale of China's banking industry has grown by an average of 10.8% annually from 2019 to 2023, and this growth rate is much higher than the GDP growth rate during the same period. The rapid credit expansion has made the economy

increasingly dependent on credit, and once there is an external shock, the financial accelerator mechanism will operate in reverse. The decline in the value of corporate collateral, the tightening of bank credit leading to a significant reduction in investment, and the spread of the impact of debt defaults by some real estate companies in China in 2023 are typical manifestations of the financial accelerator mechanism in the downward phase, where credit restrictions further decline the real economy and create a vicious cycle [9] of credit crunch and economic contraction.

4.4 Transmission of liquidity risk and credit risk

When bank credit expands, the transmission mechanism between liquidity risk and credit risk is complex and is a key channel for the formation of financial vulnerability. When banks expand their credit on a large scale, the sources and uses of funds are often mismatched, relying on short-term market financing to support long-term credit supply. According to the financial stability report of the People's Bank of China, although the liquidity coverage ratio of China's banking sector met regulatory requirements in 2022-2023, the inter-bank dependence of small and medium-sized banks was still high, averaging 15.3%. Under such circumstances, when market liquidity tights, banks are prone to difficulties[10] in refinancing. The increase in credit risk leads to the default of some borrowers, and the quality of bank assets deteriorates accordingly. This may cause investors to worry about the solvency of banks, resulting in short-term financing difficulties and liquidity tightness. In this way, credit risk affects liquidity risk, and banks then contract credit, which in turn affects the real economy. Thus the key transmission chain between bank credit expansion and financial vulnerability is formed.

5. Conclusions

This study systematically analyzed the theoretical association between bank credit expansion and financial vulnerability and revealed the intrinsic mechanism of their connection. Starting from Minsky's financial instability hypothesis, it can be found that when bank credit expands, the financing structure tends to shift from hedging type to speculative type and Ponzi type, which is the intrinsic mechanism of the accumulation of financial fragility. And excessive credit expansion, through the balance sheet effect, will force economic entities to make leveraged adjustments when impacted, thus creating a self-reinforcing vicious cycle. In addition, the financial accelerator mechanism can explain how bank credit expansion can fuel economic upturns and increase economic volatility during downturns, thereby exacerbating financial vulnerability. Finally, the maturity mismatch of bank credit expansion complicates the transmission between liquidity risk and credit risk and further increases the vulnerability of the financial system.

China's current financial regulatory policies can draw important lessons from the research findings to strengthen counter-cyclical regulation, control excessive credit expansion by banks during economic booms to prevent systemic risk build-up, and optimize the credit structure to direct funds to key and weak areas of the real economy, avoiding empty circulation or excessive inflow of funds into high-risk areas in the financial system. In addition, it is necessary to improve the financial regulatory system, strengthen the management of bank balance sheets and control the risk of maturity mismatch, and build a more effective risk early warning mechanism to strike a balance between promoting economic growth and safeguarding financial stability.

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