

The Dynamic Impact of Financial Disintermediation on Credit Business of Chinese Commercial Banks

Macro Data from China's Capital Market

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ABSTRACT

Commercial banks play an important role in China's financial system. However, financial disintermediation has a significant impact on the traditional credit business of commercial banks. The scale of commercial banks' capital stock has been gradually diverted from the source, causing a certain impact on the credit business. By establishing VAR model, the study found that the impact of bonds and stocks on loans will have alternating response fluctuations in positive and negative directions, repeating the trend once in a 5-year cycle. After the insurance and trust had an impact on the loans, it showed a trend of first falling, then rising and then continuing to fall, indicating that the impact of insurance and trust on commercial bank loans is quite strong. This paper has far-reaching significance for the strategic transformation, structural adjustment, and financial reform of China's commercial banks, in order to effectively guide the commercial banks to actively respond to the challenges of financial disintermediation.

Keywords: Commercial Banks, Financial Disintermediation, Dynamic Impact, VAR model.

1. INTRODUCTION

China's financial market is growing rapidly and its opening degree is deepening. Social funds are gradually separated from traditional financial intermediaries such as commercial banks and flow directly to the low-cost financing market that borrowers are more willing to accept. Therefore, the funds that should have been deposited in commercial banks were rapidly stripped away. The scale of the capital stock of commercial banks has been gradually diverted from the source. At the same time, with the establishment of the Shanghai and Shenzhen stock exchanges and the development of the stock and bond markets, the savings level of commercial banks has been further suppressed, and the bank's capital stock has become unprecedentedly tight, commercial banks have to rely on short-term deposits to issue long-term loans.

In recent years, the growth of money supply in China's financial market has slowed down, and large-scale funds have gradually bypassed commercial banks and flowed to various financing channels such as trust financing, private lending, bond financing, stock financing, and the third board capital market. In addition,

with the booming development of Internet finance, large-scale assets have left commercial banks and flowed to various channels such as wealth management products and insurance products. The efficiency of capital allocation in the financial market is changing with the ever-increasing trend of financial disintermediation, which has aroused the focus of commercial banks, financial supervision departments, macro decision-making departments, and financial researchers.

Funds quickly enter the capital market without passing through traditional financial institutions such as commercial banks, prompting the rapid growth of the direct financing market, the economic phenomenon known as financial disintermediation [1]. As a traditional financial intermediary, commercial bank's profit model encounters strong challenges, and its status as a financial intermediary is gradually weakened. How commercial banks can actively adapt to the living environment under the background of financial disintermediation, how to make effective breakthroughs and innovations in the existing traditional credit business models, and how to maintain liquidity while considering risk management and policy supervision, will all be important issues for Chinese commercial banks. Under the influence of

financial disintermediation in China's commercial banks, how to develop traditional credit business smoothly and take measures to effectively avoid the impact is the purpose of this study.

2. LITERATURE REVIEW

2.1. Theoretical Research on Financial Disintermediation

Merton (1995) first proposed the FIS (Financial Innovation Spiral) theory. Commercial banks are the most typical traditional financial intermediaries, customizing exclusive financial products for specific customers. However, this violates the product rules of financial market because it usually provides financial products with standardized terms, the pricing is fully disclosed, and the price information widely accepted by investors. Inspecting the relationship between financial intermediaries and financial markets, it is a mutually coordinated and dependent relationship from a dynamic perspective [2]. Following Merton's research, Saffo (1998) proposed the Re-intermediation theory. Research shows that financial intermediaries led by commercial banks will not lose original status, but financial disintermediation can rejuvenate and create new financial intermediary organizations or institutions that are more dynamic and competitive. This phenomenon is called financial disintermediation correction effect. Nissen (2000) studied from the perspective of corporate governance and found that under the influence of financial disintermediation, the endogenous financial innovation of commercial banks prompted commercial banks to improve risk management awareness and improve corporate governance structure, enhance the position in financial market and improve the profitability [3]. Alan Ching-biuTse (2003) proposed the correction effect of financial disintermediation, financial disintermediation will allow commercial banks to better play their financial intermediary functions, and even generate new financing intermediaries, which will not make commercial banks lose intermediary functions.

2.2. The Causes and Measurements of Financial Disintermediation

In order to ease the inflationary pressure in the United States after the war, the Federal Reserve adopted a tightening monetary policy, issued Regulation Q to set an interest rate ceiling for mandatory measures, which accelerated the influx of financial funds into the capital market and led to the emergence of financial disintermediation (Hester, 1969). An important reason for the rise in mortgage and savings account interest rates is the rise in real interest rates, which promotes financial disintermediation [4]. A potential relationship between economic growth and real interest rates, financial disintermediation brought about a sharp drop in real

interest rates, even negative, indicating that financial disintermediation can have an effective regulatory effect through economic growth. In addition, electronic information technology is a fuel for financial disintermediation (FryMj, 1997). The rise of electronic finance has improved information transparency and effectively resolved information asymmetry between transaction parties, thus weakening the intermediary status of financial institutions, especially the differential pricing model, which has caused commercial banks to lose high net worth, high profit sources, and customer resources who willingness to cooperate for a long time [5]. The development of direct financing market not only guides the development of financial instruments, but also brings about the phenomenon of financial disintermediation (Kothari V, 2006). In developed countries, especially with rapid industrial development, the degree of intensification and globalization of financial market is more obvious, which will inevitably lead to the deepening of financial disintermediation and fierce market competition, and severely damage the profit margins of commercial banks [6].

By using three indicators: the ratio of deposits to GDP, the ratio of deposits to domestic financial assets, and the ratio of real growth of deposits, who was the first time to measure the development trend of financial disintermediation in Italy (Xin, 1990). Considering the Mann-Whitney U rank model and test method to empirically analyse the financial disintermediation, the empirical results show that the monetary policy effect formulated by the central bank is weakened by the financial disintermediation (Wang, 2009). Based on the actual situation in China, established a financial indicator system and introduced the MS-AR model to enrich the empirical research on the impact of financial disintermediation [7].

2.3. The Impact of Financial Disintermediation on Commercial Banks

It only adjusts the internal structure and functional system of commercial banks to a certain extent and will not weaken the intermediary authority of commercial banks in the financial market for many years, but objectively promotes the trend of debt securitization of commercial banks (A. Hackethal, RH Schmidt and M. Tyrel, 1997). The results of comparative study of traditional banks and emerging banks under the trend of financial disintermediation show that commercial banks, driven by the trend of financial disintermediation, carry out effective financial products, business innovation, the development of information technology and the creation of diversified financing channels for commercial banks. In the era of financial disintermediation, traditional commercial banks urgently need to change profit-making methods [8]. Not only the financial intermediary status of commercial banks not disappeared, but financial

disintermediation only weakens part of the bank's intermediary function but will instead prompt banks to carry out various reforms and innovations (Nissen, 2000). In developed countries, especially with a good industrialization foundation, the competition in the financial market is extremely fierce, the financial market is gradually becoming more intensive and globalized, the financial disintermediation is gradually deepening, and financial products are constantly innovating. The business model of commercial banks caused a huge impact [9]. Taken the United States as sample, through in-depth investigations found that the application of mobile network payment methods and the popularization or promotion of mobile banking impact on the deposit and loan business of commercial banks transformation [10].

3. EMPIRICAL RESEARCH DESIGN

3.1. Research Model

Vector autoregressive model was first proposed by Simmons in the 1980s. This model takes the form of simultaneous equations, in its each equation, all the explained variable on other variables in the model of hysteresis return, to estimate the mutual dynamic relationship between the endogenous variables. Economic interpretation of the estimated value of a single variable is difficult due to the consistency of OLS estimates in parameters of the vector autoregressive model. Therefore, the use of impulse response function in the model is usually considered.

3.1.1. The Vector Autoregression Model

In the vector autoregression (VAR) model, the lagged factors of the explained variables are regarded as explanatory variables, and all the influencing factors are included as endogenous variables. The VAR model is:

$$Y_t = \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_p Y_{t-p} + H_1 X_{t-1} + \dots + H_r X_{t-r} + \varepsilon_t \quad (1)$$

X_t is composed of n-dimensional exogenous variable vector, Y_t is constructed by m-dimensional endogenous variable column vector, r and p represent the lag intervals of exogenous and endogenous variable respectively, and ε_t represents the m-dimensional random error term column vector.

3.1.2. The Impulse Response Function

Impulse Response Function abbreviated as IRF, which can examine the impact of current and future values of endogenous variables within a standard deviation range from random error term in time series analysis, while the random error term ε_t will impact a specific economic variable, and indirectly affect all other variables through the open dynamic structure of the

model. In this study, a VAR (2) model is used to investigate the impulse response function:

$$m_t = a_1 m_{t-1} + a_2 m_{t-2} + b_1 n_{t-1} + b_2 n_{t-2} + \varepsilon_{1t} \quad (2)$$

$$n_t = c_1 m_{t-1} + c_2 m_{t-2} + d_1 n_{t-1} + d_2 n_{t-2} + \varepsilon_{2t}, \quad t=1,2,\dots,T \quad (3)$$

a_1, b_1, c_1, d_1 are parameters, random disturbance term is $\varepsilon_t = (\varepsilon_{1t}, \varepsilon_{2t})'$, At the same time, it is theoretically assumed that the above system begins from period 0, set $m_{-1} = m_{-2} = n_{-1} = n_{-2} = 0$, $\varepsilon_{10} = \varepsilon_{20} = 0$, and $\varepsilon_{1t} = \varepsilon_{2t} = 0$ ($t=1,2,\dots$), called period 0 Impulse m , followed by a discussion of the responses of m_t and n_t :

When $t=0$, $m_0=1$, $n_0=0$, substitute it into VAR (2);

When $t=1$, $m_1=a_1$, $n_1=c_1$, and then taking the result into VAR (2);

When $t=2$, $m_2=a_1^2+a_2+b_1c_1$, $n_2=c_1a_1+c_2+d_1c_1$, by analogy can get: $m_0, m_1, m_2, m_3, \dots$ is called the functional response of m occurring after a pulse of variable m . By this method get: $n_0, n_1, n_2, n_3, \dots$ called variable m is followed by a functional response of n .

3.2. Variable Selection and Sample

The research data selects the 1-4 quarters of 2010-2016 as the research period, and the data sample selects the loan scale of commercial banks, the GDP stock scale, and a number of direct financing and issuance scales in the financial market. The study mainly consulted the "China Financial Statistical Yearbook" and the data from 2000 to 2016 in "China Statistical Yearbook" of the Bureau of National Statistics. To achieve the comprehensiveness of the research, this paper has sorted out the securities issuance public information published on the website of the China Securities Regulatory Commission, the public credit data of the People's Bank of China, the trust investment information data on the website of the China Trustee Association, and the public information on the China Bond Information Network and the China Insurance Regulatory Commission website. In addition, the relevant variable data were quoted from the Wind database and the China Economic Net database, and 6 indicators were finally determined, and the corresponding quarterly values were selected:

Credit indicator (Loan), summarize the quarterly value of various RMB loan balances of Chinese commercial banks and differentiate the data to obtain the quarterly incremental value of loans.

GDP quarterly value (Gdp_Sa), used the X12 method to make quarterly adjustments to the current quarterly cumulative value of GDP.

Bond indicator (Bond), quarterly value of securities financing. Aggregate the accumulated quarterly value data of corporate bond balance, asset-backed securities scale stock, medium-term note scale stock value, and bond issuance indicators such as collective bills, short-

term and ultra-short-term financing bills, and other bond instruments.

Stock indicator (Stock), total quarterly value of funds raised in domestic and overseas stock markets.

Trust indicator (Tru), the value of trust assets for the current quarter. Including the quarterly value of securities investment trusts, the quarterly value of loan trust data, the quarterly data of three basic trust products, including debt investment trusts, equity investment trusts, and equity investment trusts, as well as the quarterly values of financial leasing trusts and portfolio investment trusts. Cumulative data on the current quarterly value of various types of trust financing scale, such as the current quarterly value, the current quarterly value of interbank trusts, the current quarterly value of repurchase resale trusts, and other forms of investment trusts.

Insurance indicator (Ins), insurance income. Sort out the original insurance premium income from the operating income of the insurance industry, including the total value of property insurance and life insurance.

3.3. Empirical Analysis

3.3.1. Cointegration Test

From Table 1, it is a statistical cointegration relationship between the above 6 variables. In addition, the characteristic root trace test proves that there are 3 cointegration vectors of cointegration.

Table 1. Trace test results in Johansen cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.951851	173.9921	95.75467	0.0000
At most 1 *	0.893433	110.3337	69.81990	0.0000
At most 2 *	0.801796	63.32588	47.85714	0.0008
At most 3	0.547822	29.34892	29.79808	0.0664
At most 4	0.337889	12.68633	15.49572	0.1370
At most 5 *	0.174706	4.029856	3.841567	0.0448

* represents rejection of the null hypothesis at the 5% significance level; ** represents MacKinnon-Haug-Michelis (1999) p-values.

3.3.2. Granger Causality Test

The test results show that the Prob. values are all less than 0.05, then at the 5% significant level, the null hypothesis that Gdp, Bond, Stock, Tru, and Ins are not the Granger causes of Loan can be rejected, or that Bond, Gdp, Ins, Tru, Changes in Stock are the Granger cause of changes in Loan and are quite significant at the 5% significance level.

Table 2. Granger test between Loan and Bond, GDP, Ins, Tru, Stock

Null Hypothesis	Chi-sq	df	P Values
Bond	6.349590	2	0.0418
Gdp_Sa	8.435057	2	0.0147
Stoc	6.656571	2	0.0359
Tru	7.511519	2	0.0234
Ins	6.374590	2	0.0413
All	47.01081	10	0.0000

3.3.3. Maximum Lag Order

It is verified by econometric criteria such as FPE, LR, SC, AIC, and HQ, and the coefficients of the second-order lag are $4.97e+37^*$, 116.3142^* , 106.4531^* , 102.5734^* , 103.4154^* , which are significant at 5%. To fully ensure the sufficient degrees of freedom of the VAR model, the 2 lag order is very reasonable, it is unnecessary to discuss the 3 lag order.

3.3.4. Model Parameter Estimation

The parameter estimation outputs 6 sets of parameter results, the constant term is regarded as an exogenous variable factor. Therefore, the parameter estimation results for the dependent variable Loan are all columns:

$$Loan_T = 0.314267loan_{t-1} - 0.528993loan_{t-2} - 0.636337gdp_{t-1} + 0.593381gdp_{t-2} + 1.994757bond_{t-1} - 4.019139bond_{t-2} + 0.667668stock_{t-1} + 2.812615stock_{t-2} + 0.884248tru_{t-1} - 0.688300tru_{t-2} - 4.909937ins_{t-1} + 0.140270ins_{t-2} \quad (4)$$

3.3.5. The Impulse Response Function Result

In this paper, the second-order maximum lag order of the VAR model is determined. Under this model, a forward shock of 1 unit is tried for Bond, Gdp_Sa, Ins, Tru, and Stock respectively, to obtain the decomposition diagram of the impulse response function, as shown in Figure 1.

Gdp_Sa shocks the loan with 1 unit, and the impulse response of the variable Loan shows obvious periodic fluctuations, first rising, then falling, and then rising again, which is a form of repeated response. Bond, Ins, Tru, and Stock launch shocks to the Loan in units of 1, and the impulse response of the variable Loan reflects the reverse shock response with different degrees. Bond and Stock will have repeated positive and negative response fluctuations, and the trend will repeat once in a 5-year cycle, which is exactly in line with the 5-year cyclical fluctuation of the Chinese securities market. Showing the continuation of the trend of reverse response year by year. After insurance and trust attack the Loan with 1 unit, the loan variable will show a completely different trend from bond and stock, showing a trend of rising and then continuing to decline after falling, which proves that insurance and trust impact on commercial bank loan business is quite strong.

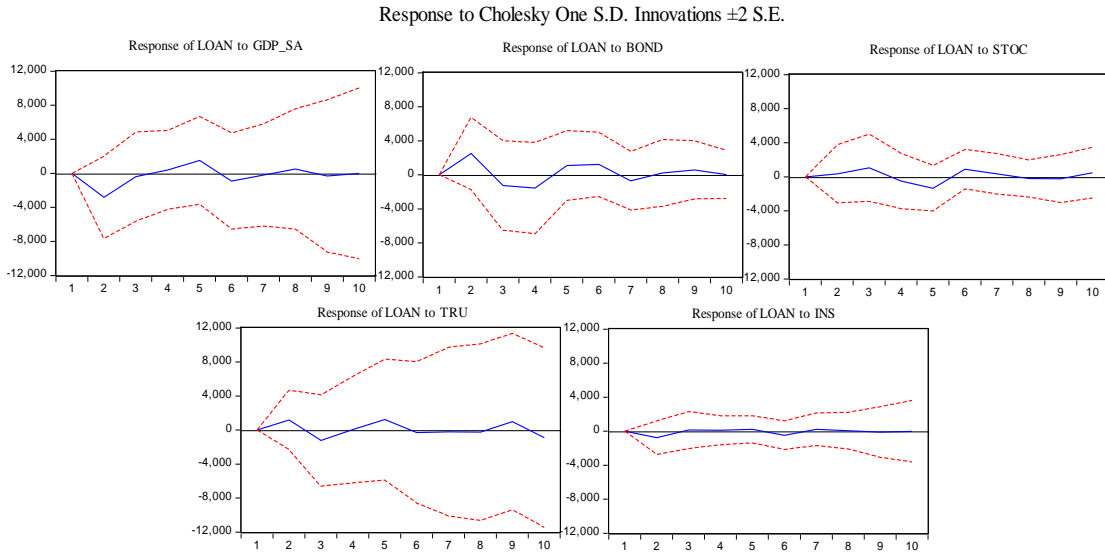


Figure 1 IRF of Loan to Bond, Gdp_Sa, Ins, Tru, Stock

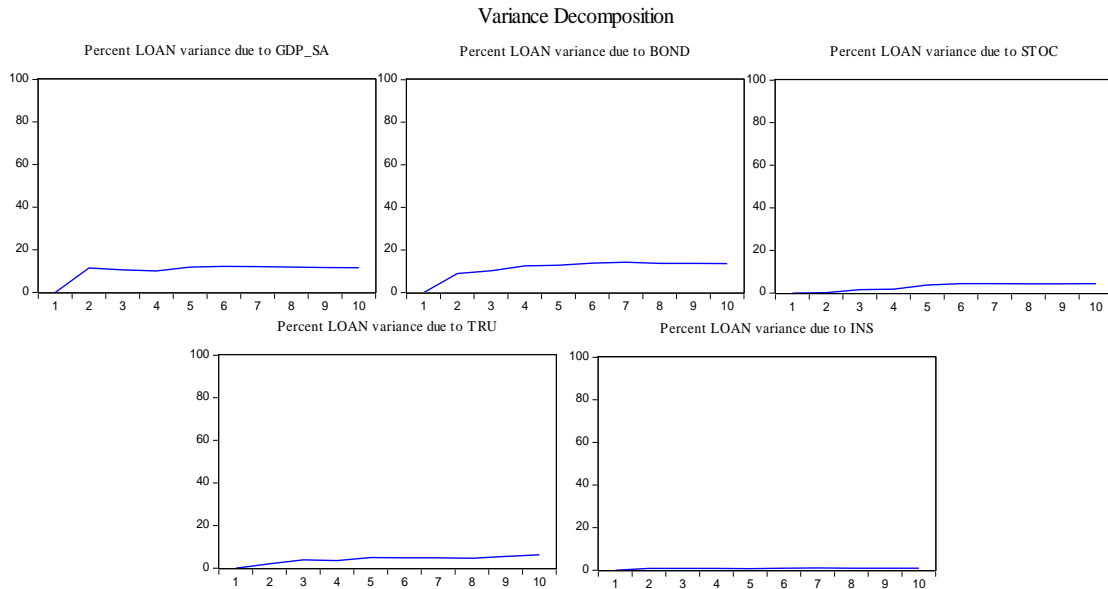


Figure 2 Variance decomposition for Loan

3.3.6. Variance Decomposition

This paper shows the 10-unit intertemporal variance decomposition, as shown in Figure 2. Bond and Gdp_Sa are quite sensitive to the credit factor Loan, showing a rapid growth trend from the 1 to the 3 period. At the same time, the contribution rate of Bond to the credit factor is nearly 20% and lasts for more than 10 periods or longer. However, the Stock response to the credit factor Loan is quite slow, and the contribution rate to the credit factor did not reach 10% until after the 6 period. Besides, it can also be observed that insurance and trust still respond slowly to the credit factor Loan, trust gradually increased at a low speed in the first 2 periods, and the contribution rate to the credit factor in each subsequent period gradually reached 10%, while the contribution of

insurance, the level is extremely low, failing to exceed 5%.

4. CONCLUSION

At present, the role of bond financing in the capital market to divert Chinese commercial bank loans is relatively obvious, and it still shows a strengthening trend after a period of lag; financing through the issuance of trust products, stocks, and insurance products, in a relatively short period of time to observe its impact on commercial bank credit is limited because it is easily constrained by regulatory policies. However, as China's financial instruments regulations become more and more abundant and the financial market-related systems are increasingly improved, if the asset business model of China's commercial banks remains the same, there will

be more types of financial instruments that will impact commercial bank loans in the capital market in the future, the credit assets will be diverted.

AUTHORS' CONTRIBUTIONS

This paper fully considers that various disintermediation factors such as trust capital market, securities, bond, and insurance asset market impact commercial banks, and innovatively incorporates them into the research scope. Comprehensively consider the above factors to conduct quantitative research on financial disintermediation, try to quantify bonds, stocks, insurance wealth management and trust financing, closely combine the functional innovation of commercial, and try to open up the dynamic impact of financial disintermediation on a new research entry point of Chinese commercial banks.

The quantitative indicators of the explanatory variables selected in this study are relatively comprehensive. Corporate bonds, IPOs of listed companies, short-term financing bills, and medium- and long-term bills are all included in the variables. Linking the interaction between economic variables and GDP growth, the introduction of stock scale, bond financing, trust financing, premium income capital variables, quantitatively study the dynamic impact response of Chinese commercial banks' credit business to financial disintermediation. This has far-reaching significance for its strategic transformation, structural adjustment, and financial reform.

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