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Potential risks of excessive financialization of the real estate market on the macroeconomic crisis

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Abstract In order to uncover the appearance of the bubble economy in the real estate market and promote the rational allocation of resources, this paper studies the potential risks of excessive financialization of the real estate market on the macroeconomic crisis. Based on the constructed model of the relationship between excessive financialization of the real estate market and macroeconomic crisis, the excessive financialization of the real estate market is refined into four factors, namely, the increase in the total amount of selected finance, the expansion of the balance sheet, the increase in land and property mortgages, and the intensification of the degree of financial expansion, and the hypothesis that all of these factors may exacerbate the macroeconomic crisis is put forward. The experimental results show that the correlation coefficient values of these four factors on macroeconomic crises are 0.447, 0.441, 0.446, and 0.443, respectively, suggesting that an increase in financial aggregates, balance sheet expansion, an increase in land and property mortgages, and an increase in the degree of financial inflation, can all significantly elevate the occurrence of macroeconomic crises.

Index Terms real estate market, excessive financialization, macroeconomic crisis, balance sheet, land property mortgages

I. Introduction

Real estate not only provides residents with a living environment, but also provides venues for a variety of activities. With the rapid development of the real estate industry, residents began to invest a large amount of money into real estate development, expecting to obtain higher returns through real estate investment [1]. The rise of the real estate industry has effectively driven the development of the national economy, and it is evident that the real estate industry has a great impact on the positive development of the nation. For example, under China's policy of vigorously supporting the development of real estate, real estate prices have risen year after year, residents' real estate investment behavior has increased year after year, and the transactions are overly reliant on credit and financial derivatives, which leads to the phenomenon of over-financialization of the real estate market [2]. Excessive financialization of the real estate market can lead to increased vulnerability of the financial system, amplified macroeconomic cyclical fluctuations, and even social risks and long-term economic structural imbalances [3].

Excessive financialization of the real estate market will lead to the false prosperity of the real estate market, financial institutions in order to meet the credit needs of the real estate market, will launch a variety of innovative credit products, through the process of rapid expansion of credit services by financial institutions, creating the real estate market as well as the financial institutions of the bubble economy, blinded by the phenomenon of false prosperity, leading to the real estate market as well as financial institutions ignored the potential for riskiness [4]. In the face of a sudden decline in real estate prices, risk resistance is seriously inadequate, credit chain breaks lead to the real estate industry called a halt at the same time, financial institutions are facing a serious loss crisis, greatly increasing the potential risk of macroeconomic crisis. Therefore, this paper refines the excessive financialization of the real estate market, respectively, from the increase in the total financial volume, balance sheet expansion, the increase in land and property mortgages, and the intensification of the degree of financial expansion of the four factors, to analyze the relationship between it and the macroeconomic crisis, so as to verify the impact of the excessive financialization of the real estate market on the macroeconomic crisis.

II. Model construction and research hypotheses

II. A. Relationship model

The relationship model, shown in Figure 1, analyzes the relationship between excessive financialization of the real estate market and macroeconomic crisis. Along with the increase of financial aggregate, it will result in the false

increase of financial aggregate, misallocation of resources, and the formation of the illusion that the real estate industry seems to be prosperous but is actually declining. At the same time catering to the surge in total financial volume, bank derivative products began to appear continuously, but the derivative product business lacks scientific management, the flow of funds is not transparent, when real estate prices fall financial derivative chain collapse, at this time will bring huge losses to the financial system [5]. Balance sheet expansion makes the amount of local investment in mortgage liabilities increase, expanding the size of the government's debt, the impact of social and economic fluctuations caused by the collateral value of the collateral is reduced, resulting in a sudden drop in the capital adequacy ratio of the bank, forced to contract credit. The rise in the proportion of land mortgages, in the context of falling real estate prices, land auction rate increases, the local government will not be able to repay the debt resulting in currency devaluation and capital flight. Land mortgages may not only result in high investment and low returns, hindering high-quality economic growth. Increased levels of financial inflation could lead to inflated asset valuations, which could trigger a financial crisis.

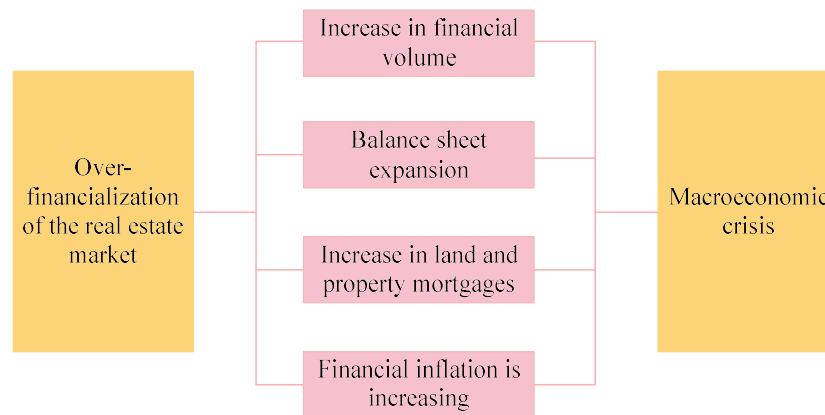


Figure 1: Relationship model

II. B. Research hypothesis

II. B. 1) Increase in financial aggregates

The development of the real estate industry can not be separated from a large amount of capital investment, real estate sales can not be separated from the financial support, visible real estate industry's capital-intensive attributes, but also highlights the existence of an inextricable relationship between real estate and finance. Since the housing system has undergone profound reform around 2010, China's real estate industry has begun to rise rapidly, the volume of real estate transactions has increased dramatically, and the amount of investment is also increasing, while the scale of speculation is gradually expanding, and this process requires a large amount of financing to do the reliance [6]. Considering that the new crown epidemic in 2019 is significant for the social economy, and the real estate industry has been hit by an unprecedented blow, this paper selects the data of real estate development loans and personal housing loans in 2009-2018, and the changes are shown in Figure 2, and the data are from the Wind database. It can be seen that the real estate development loans and personal housing loans in 2009-2018 have been increasing. During this period, the credit capacity of financial institutions has increased for a short period of time, and in 2018, real estate prices are at their peak stage, with 90% of the credit of financial institutions in individual quarters coming from the real estate side. This type of background, in case of a fall in real estate prices can lead to a break in the chain of financial derivatives, causing huge economic losses to the financial system.

Based on the above analysis, hypothesis H1 is proposed: the over-financialization of real estate will lead to an increase in financial aggregates, further contributing to the macroeconomic crisis.

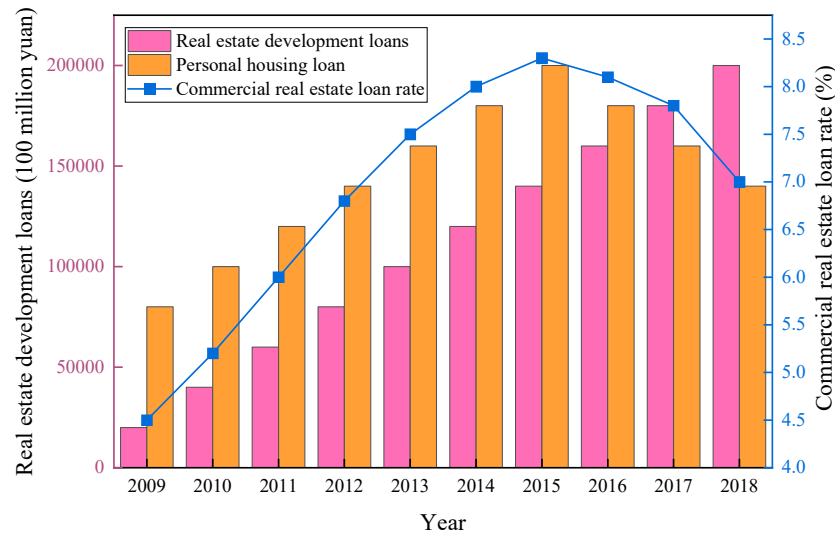


Figure 2: Changes from 2009 to 2018

II. B. 2) Balance sheet expansion

Considering from the aspect of banks' assets and liabilities, when real estate prices have been in an upward phase, the risk of collateral depreciation will be substantially reduced. In the case of banks with good capital adequacy, they will increase the research and development of financial derivative products to further enhance the ability of real estate credit services, which not only enhances the bank's credit capacity, but also improves the money multiplier [7]. From the point of view of the indebtedness of enterprises and residents, when real estate prices rise, the value of the properties owned by themselves will also be increased [8]. In this context, the increase in net worth and the rise in house prices will raise the value of real estate for enterprises and residents, making net worth rise and expanding the scale of assets and liabilities. However, once the social and economic fluctuations, resulting in a fall in the value of into collateral, so that the bank capital adequacy ratio plummeted, forced to contract credit. At this time, the lack of financial support for enterprises can not carry out investment and production, thus seriously inhibiting the development of the macro economy.

Based on the above analysis, hypothesis H2 is proposed: excessive financialization of real estate expands the balance sheet and aggravates the macroeconomic crisis.

II. B. 3) Increase in land and property mortgages

Individuals and enterprises in real estate transactions and investment, need to borrow funds from financial institutions through asset collateral, and land and property is an important part of the asset collateral, the value of the collateralized land and property determines the borrower's ability to finance [9]. When real estate prices rise, the value of the land and property mortgaged will also rise as mentioned above, which will help the financing to go smoothly. On the contrary, the decline in real estate value makes the value of the mortgaged land and property shrink with it, and the financing process will be extremely difficult at this time. Enterprises or individuals are difficult to repay loans for real estate investment, their consumption capacity will decline, which in turn leads to a reduction in the level of consumption of residents, fundamentally affecting the development of the macro economy [10].

Based on the above analysis, the proposed hypothesis H3: excessive financialization of real estate makes the increase of land and property mortgages, increasing the macroeconomic crisis.

II. B. 4) Increased financial inflation

With the financialization of the real estate market, the business volume of financial institutions has increased significantly, mainly in lending, in order to meet the lending needs of real estate transactions, investment as well as speculation, financial institutions have innovated the financial business and introduced the business of shadow banking and network lending [11]. This type of financial derivative business can not only evade the restrictions of credit policy, but also increase the leverage of enterprises, thus enhancing profitability. However, this over-financialization of real estate has led to a rapid expansion of the financial sector, and the financial business chain has become fragile and chaotic due to the rapid expansion and lack of scientific management. Once there is a plunge in real estate prices, financial institutions will not be able to respond in a timely manner and have a weaker risk-resistant ability, thus increasing the risk of macroeconomic crisis [12].

Based on the above analysis, the proposed hypothesis H4: excessive financialization of real estate exacerbates the degree of financial expansion, increasing the risk of macroeconomic crisis.

II. C. Indicators of over-financialization variables in the real estate market

From the model of the relationship between excessive financialization of the real estate market and the macroeconomic crisis, this paper assesses the potential risk of the macroeconomic crisis from four aspects: the increase in the total amount of financial volume, the expansion of the balance sheet, the increase in land and property mortgages, and the intensification of the degree of financial expansion [13], [14]. Combined with the characteristics of excessive financialization of the real estate market, the design of the relevant variables and indicators, Table 1 is the variable indicators of excessive financialization of the real estate market, introducing the variables of excessive financialization of the real estate market and their specific definitions.

Table 1: Variable indicators of excessive financialization of the real estate market

Variable	Variable Identifier	Variable Definition
The total amount of finance increases A	A1	Real estate transactions rely on credit from financial institutions
	A2	Real estate investment relies on credit from financial institutions
	A3	Real estate speculation relies on credit from financial institutions
	A4	Financial institutions' credit is mainly used in the real estate market
Balance Sheet Expansion B	B1	Rising property prices increase the total value of assets
	B2	Rising mortgage property prices increase liabilities
	B3	Buying a home with zero down payment has led to a surge in loan balances
	B4	Consumer loans and business loans illegally flow into the real estate market
Increase in land and property mortgages C	C1	Rising real estate prices make land and property useful as collateral for lending
	C2	Real estate and land mortgages form a "land acquisition-mortgage-re-land acquisition" cycle mechanism
	C3	Mortgage of projects under construction, resulting in multiple loans under one mortgage
	C4	The financing platform uses land mortgage financing and then uses project assets as counter-mortgage to form a cross-guarantee of government credit + real estate mortgage
Financial inflation is increasing D	D1	Launch a variety of financial lending businesses to meet real estate lending needs
	D2	The expansion of lending business increases the leverage ratio of enterprises and enhances their profit acquisition
	D3	Real estate development and real estate transactions and investment volumes increased
	D4	The inflated value of real estate has led to an increase in lending by financial institutions

III. Findings and analysis

III. A. Factors of excessive financialization of the real estate market

In this chapter, the overfinancialization of real estate market is decomposed into four factors: increase in total financial volume, expansion of balance sheet, increase in land and property mortgages, and increase in the degree of financial expansion, and the study of overfinancialization of real estate market is completed through the analysis of the factors. Through the reliability test of the factors, its applicability in the analysis of excessive financialization of real estate market is verified. The KMO and Bartlett test are shown in Table 2. The test results show that the KMO value is 0.805, while the KMO standard value is 0.700, which indicates that there is a good intrinsic connection between the variables in this paper. The Bartlett sphericity test Sig. value is 0.000, which indicates that the sample is suitable for factor analysis.

Table 2: KMO and Bartlett test

KMO and Bartlett's test		
Kaiser-Meyer-Olkin test for sampling adequacy		0.805
Bartlett's test of sphericity	Approximate Chi-Square	4091.020
	df	112
	Sig.	0.000

In order to verify the consistency inherent in the four factors of excessive financialization of the real estate market, the factor analysis of excessive financialization of the real estate market is shown in Table 3. The results

show that the Cronbach's α coefficients of the four factors, namely the increase in total financial volume, balance sheet expansion, the increase in land and property mortgages, and the increase in the degree of financial expansion, are 0.879, 0.875, 0.881, 0.882, respectively, which are all greater than the standard value of 0.800, indicating that the four factors decomposed have a desirable inherent consistency. The factors were extracted by principal component analysis and the characteristic roots were obtained under the rotation of variance, and the four main factors explained a total of 71.229% of the total variance, which exceeded the minimum standard of 60%. Therefore, the scale of this paper can provide a desirable explanation of the excessive financialization of the real estate market with high validity.

Table 3: Analysis of factors of excessive financialization of the real estate market

Variable	Factor loading	Cronbach's α	Factor	Eigenvalue	% of Variance Explained	Cumulative %
A1	0.753	0.879	Increase in financial aggregate	6.504	40.653	40.653
A2	0.796					
A3	0.817					
A4	0.805					
B1	0.795	0.875	Balance sheet expansion	2.095	13.096	53.749
B2	0.861					
B3	0.841					
B4	0.827					
C1	0.806	0.881	Increase in land and property mortgages	1.546	9.662	63.412
C2	0.782					
C3	0.884					
C4	0.851					
D1	0.813	0.882	Financial inflation is increasing	1.251	7.817	71.229
D2	0.773					
D3	0.862					
D4	0.830					

III. B. Relationship Validation

The above factor analysis of excessive financialization of the real estate market verifies the internal consistency of the four factors, and the Pearson correlation coefficient (r) will be applied to measure the strength and direction of the correlation between the variables. When the correlation coefficient is $0 < r \leq 1$, it indicates a positive correlation between the variables. When $r = 0$, there is no correlation between the variables. When the correlation coefficient is $-1 \leq r < 0$, there is a negative correlation between the variables.

In this paper, based on the four aforementioned variables, the plus macroeconomic crisis potential risk variables are introduced, and their corresponding factor loading values are weights, and the five factors are weighted and averaged. Table 4 shows the correlation between the variables. Where $*P < 0.05$, $**P < 0.01$, $**$ represents significant correlation. It can be found that the correlation coefficients between the five variables are positive and the correlation is significant, indicating a strong positive correlation between the variables. The correlation coefficients between four factors, namely, the increase in total financial volume (A), the expansion of balance sheet (B), the increase in land and property mortgages (C), and the increase in the degree of financial expansion (D), and the potential risk of macroeconomic crisis are significant, with correlation coefficients of 0.447, 0.441, 0.446, and 0.443, which are not only greater than 0, but also with coefficients of 0.44. Therefore, it shows that there is a strong positive correlation between the four factors of excessive financialization of the real estate market and the potential risk of macroeconomic crisis, and the four factors have a positive impact on the potential risk of macroeconomic crisis, and the hypotheses H1-H4 are all valid.

Table 4: Correlations among variables

Variable factors	Project	A	B	C	D	Potential risk of macroeconomic crisis
A	r	1	-	-	-	-
	P value	-	-	-	-	-
B	r	0.450**	1	-	-	-
	P value	0.000	-	-	-	-

C	r	0.372**	0.299**	1	-	-
	P value	0.000	0.000	-	-	-
D	r	0.294**	0.296**	0.299**	1	-
	P value	0.000	0.000	0.000	-	-
Potential risk of macroeconomic crisis	r	0.447**	0.441**	0.446**	0.443**	1
	P value	0.000	0.000	0.000	0.000	-

IV. 4. Conclusion

This paper analyzes the relationship between excessive finance in the real estate market and the macroeconomic crisis, constructs a model of the relationship between excessive finance in the real estate market and the macroeconomic crisis, and decomposes excessive finance into four core factors, an increase in the total amount of finance, the expansion of the balance sheet, an increase in land and property mortgages, and an increase in the degree of financial expansion, and puts forward four research hypotheses, and all four factors may increase the degree of the macro economic crisis. Through empirical analysis, the results show that the four factors explain 71.229% of the total variance, with ideal structural validity. The correlation coefficient values of the four factors on macroeconomic crisis are 0.447, 0.441, 0.446, 0.443, which have significant positive correlations and consistent correlations. This suggests that the increase in financial aggregates, balance sheet expansion, the increase in land and property mortgages, and the increase in the degree of financial expansion do constitute a potential risk of macroeconomic crises, and all four hypotheses have been verified. The excessive financialization of the real estate market not only exacerbates the vulnerability of the financial system, but also poses a serious threat to macroeconomic stability, and should be highly valued by financial regulators.

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