

How does leverage affect real estate market prices under current monetary policy

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Abstract

This article analyzes the mechanism by which financial leverage affects real estate price fluctuations from both practical and theoretical perspectives. Research shows that the influence of financial leverage on real estate prices is far greater than other factors; from a regional perspective, the influence of the eastern, central and western regions gradually weakened; from a sectoral perspective, the impact of financial leverage in the residential sector is greater than that of the corporate sector. rate. Finally, this article puts forward policy control measures to ensure the steady operation of the real estate market by steadily deleveraging.

Keywords

Financial leverage; real estate prices; policy control.

1. Introduction

High asset prices, especially housing prices, and high leverage are the two prominent features of my country's financial market, as well as two important issues affecting my country's future economic growth and financial stability. If these two issues are not handled properly, it is very likely that the asset price bubble will burst or the company will go bankrupt due to excessive debt, which will cause great harm to the financial system and even the real economy. Especially in the context of the current new economic normal and the imminent legislation of real estate tax, if a crisis breaks out, it will seriously slow down economic growth and even endanger social stability.

Statistics show that my country's credit-GDP ratio gap warning indicators have soared since 2008, and have exceeded the 10% international warning line since 2013, and even reached a historical high of 28.8% in the first quarter of 2016. The financial market contains great risk. In particular, since the initial establishment of the real estate market in my country in 1998, housing prices have soared nearly four times from 2,124 yuan per square meter in the first quarter of 1998 to 7,830 yuan per square meter in the second quarter of 2017. The surge in housing prices has further given birth to finance. The systemic risks contained in the system and various financial asset bubbles. More importantly, corporate leverage ratios are high, debt burdens are increasing, various financial risk indicators continue to break the warning line, financial imbalances and financial systemic risks continue to accumulate. Once the chain effect of the crash is triggered, it will not only severely damage my country's financial industry, but also my country's macro economy has brought devastating damage. To this end, in recent years, the government and the central bank have made maintaining housing price stability and deleveraging their primary policy objectives, and at the same time, based on the principle of implementing multiple monetary policies and improving the macro-prudential framework, they have adopted "shorten and increase long-term" to raise the cost of reverse repo funding Quantitative measures such as directly raising loan interest rates and even restricting

purchases and loans are aimed at curbing the skyrocketing housing prices and reducing leverage.

2. Literature review

(1) Current status of foreign research

Foreign studies on monetary policy, leverage and real estate prices mainly include monetary policy that affects bank credit leverage through interest rate channels and risk-taking channels (Zicchino, 2006; Bruno & Shin, 2015). Low interest rate monetary policy will also increase bank leverage and increase bank leverage. Increase bank risks (Angeloni et al., 2015), and even endanger the stability of financial markets (Borio & Zhu, 2012). However, high interest rates reduce housing demand by increasing the cost of housing purchases, thereby forcing housing prices to fall (Goodman & Thibodeau, 2008). In particular, the more developed the credit market, the more obvious the negative impact of interest rate policy on real estate market prices through credit channels (Zhu et al., 2017; Robstad, 2018). Moreover, in a highly leveraged environment, monetary policy will have a greater impact on housing prices. The regulation effect is greater (Notaprietro & Siviero, 2015). However, when asset prices plummet, banks take the initiative to shrink credit, and the loan quotas granted to enterprises and households are limited and the macro-leverage ratio decreases (Jiménez et al., 2012). It can be seen that there is a dynamic relationship between monetary policy and credit leverage and asset prices that interact and restrict each other. However, in recent years, studies have also found that the rejection of the interest rate channel, that is, the impact of price-based monetary policy on the leverage ratio, is relatively limited in the test of the effect of monetary policy on bank loans through interest rate channels and stock market channels (Krainer, 2014). In particular, under the tightening monetary policy, companies with high leverage ratios can isolate the transmission of interest rates to their debt leverage constraints like the “insulation hypothesis” (Kaya & Banerjee, 2014). Different from the above-mentioned price-based monetary policy, Zhu et al. (2017) recently found through a study of the European real estate market that in the free mortgage market, the impact of quantitative monetary easing can significantly stimulate the prosperity of the real estate market. However, there are also studies that believe that although quantitative monetary shocks can successfully control housing prices in the short term, the policy effects cannot be sustained in the long term (Chenet et al., 2013).

(2) Current status of domestic research

Domestic scholars have done a lot of research in this area. Representative studies such as Hu Zhipeng (2012) pointed out that my country currently mainly relies on quantitative monetary policy, but due to the increasingly unstable money demand function, the limitations of quantitative monetary policy have gradually emerged. The central bank should focus more on price-based monetary policy. Moreover, price-based monetary policy is more effective in regulating macroeconomic fluctuations than quantitative monetary policy (Yang Yuanyuan et al., 2017), but given its relatively short duration (Ma Xinyuan and Zhao Tianyi, 2016), therefore, in the short term, price Monetary policy is more effective, but in the long run, it is more appropriate to use quantitative monetary policy to regulate macroeconomic operations (Bian Zhicun and Hu Hengqiang, 2015). In particular, strengthening expectations management can further stimulate the effectiveness of monetary policy (Guo Yumei, et al., 2016). Regarding the stability of the housing market by monetary policy, representative studies such as Tan Zhengxun and Wang Cong (2015) conducted dynamic tests through the SVAR model, and found that the quantitative monetary policy has a more significant effect on housing prices, while price-based monetary policies have no effect on housing price fluctuations. very sensitive. Especially in the eastern region, especially in the first and second tier cities, the quantitative monetary policy is more effective in controlling housing prices (Yu Huayi and Huang Yanfen,

2015). In particular, when the leverage ratio is high, the correlation between house prices and leverage ratio will be magnified (Jia Qingying and Kong Yanfang, 2016). At the same time, excessive leverage will also cause asset price bubbles to surge (Liu Xiaoxing and Shi Guangping, 2018), and thus give rise to the systemic risks contained in the financial system, which endangers macro-financial stability.

3. Current situation analysis

(1) The financial leverage ratio of my country's real estate industry

With the improvement of residents' living conditions, the demand for housing improvement continues to expand, and the demand for my country's real estate market is gradually booming. Data show that in 2018, the per capita housing area of urban residents in my country reached 39 square meters, an increase of 32.3 square meters over 1978, and the gap with developed countries has gradually narrowed. Other research data

It is shown that at the end of 2018, the scale of real estate in my country's residents' wealth accounted for 70% of residents' total assets. The vigorous development of the real estate industry directly drove the rapid expansion of credit scale. As of the end of 2018, the balance of personal housing loans in my country was 25.8 trillion yuan, an increase of 10 times over 2007; the balance of real estate development loans was 10.2 trillion yuan, an increase of 6 times over 2007. The proportion of the two in financial institution loans increased from 10.3% and 6.5% in 2007 to 18.9% and 7.5% in 2018, an increase of 8.5 and 1 percentage point respectively. Overall, real estate-related loans accounted for 26.4% of loans from financial institutions in 2018. In 2018, 11.5% of my country's real estate investment and development funds came from bank loans, personal mortgage loans accounted for 14.28%, and the combined proportion of bank loans reached 28.8%. This shows the close relationship between the real estate industry and the financial industry. Specifically, banks provide financial support for the real estate industry through personal mortgage loans and real estate development loans, and the rapid development of the real estate market has driven the continuous improvement of financial leverage.

(2) The relationship between financial leverage and real estate prices

Since 2007, my country's housing prices have shown a strong growth trend. The national average price of commercial housing has increased from 3863.9 yuan per square meter at the end of 2007 to 8736.9 yuan per square meter at the end of 2018, which has nearly doubled. The change in the financial leverage ratio of the residential sector is greater than that of the corporate sector, and the trends of the two are basically the same. A comprehensive examination of the changes in the two indicators of financial leverage and housing prices reveals that the trend of changes in financial leverage and housing prices are basically maintained. Unanimously, the change in financial leverage ratio must precede the change in housing prices, which to a certain extent confirms the effect of the aforementioned changes in financial leverage ratio on the changes in real estate prices.

From the above analysis, we can see that the implementation of the financial leverage ratio control policy is based on the overall economic development situation, and its changes mainly serve economic development. The implementation of the financial leverage ratio control policy has played a great role in the real estate market price changes. Changes in regulatory policies will lead to changes in financial leverage ratio indicators, which will cause changes in real estate market prices. Therefore, in this context, exploring the impact of financial leverage on real estate price changes has strong practical significance.

4. Theoretical analysis

From a theoretical point of view, the transmission between changes in financial leverage ratio and changes in real estate prices mainly exists through three channels: currency multiplier, down payment ratio for house purchases, and bank credit.

(1) Financial leverage affects real estate prices through currency multipliers

The currency multiplier has an effect on the real estate market as follows: On the one hand, under the loose policy, the money supply increases, the currency multiplier becomes larger, and the real estate industry obtains more funds from the financial system, which boosts the rise of real estate prices. On the other hand, economic growth also drives the increase of residents' income. At present, in the absence of other investment channels, residents have greater demand for real estate, which further promotes the increase of real estate transactions, which in turn boosts the increase in real estate prices. vice versa. At the same time, the real estate industry is a capital-intensive industry and highly relies on financial leverage. Real estate development companies need higher financial leverage to operate. Residents also need long-term financial leverage to buy a house with loans, which provides a huge space for the currency multiplier effect to play a role. By changing the deposit reserve ratio and other policy measures to change the currency multiplier, the current real estate price level can be effectively adjusted.

(2) Financial leverage affects real estate prices through the down payment ratio for house purchases

The down payment ratio is the ratio of the amount that buyers need to pay immediately to the total value of the property when they buy the property. The influence of the down payment ratio on real estate prices is completed on the basis of distinguishing the nature of home buyers. Investors, improvement home buyers, and those who just need home buyers pay different attention to the down payment ratio. In the upside range of the real estate market, if the down payment ratio is reduced, all types of home buyers can use mortgage loans to obtain more funds to the fullest extent, so they tend to release their desire to buy more. Once the down payment ratio increases and the expectations of the real estate market are poor, investors may slow down or suspend investment; most buyers who just need homes have limited financial capacity, and increasing the down payment ratio often stimulates their purchase behavior. The most sensitive to changes in down payment ratio is improvement

For sex buyers, a lower down payment ratio will prompt them to buy a house as soon as possible, while an increase in the down payment ratio will make them choose to wait and see. The down payment ratio for home purchases also has a greater impact on financial institutions. As the real estate market is booming, financial institutions tend to lower the down payment ratio and issue a large number of real estate loans to increase income. Once the real estate market is in a period of contraction, driven by steady operations, financial institutions tend to increase the down payment ratio to control risks. Huang Yanfen (2016) researched that financial institutions consider real estate as high-quality collateral and are more inclined to issue personal mortgage loans. Relaxing the down payment ratio lowers the threshold for buying a house. People who cannot afford to buy a house can buy a house, and the demand for house purchases increases.

(3) Financial leverage affects real estate prices through bank credit

Financial institutions provide loans to development companies and home buyers based on real estate prices at the time. Under this mechanism, when the real estate market is in an expansion period, all parties involved in the real estate market remain optimistic. The valuation of land prices and house prices is relatively high. Financial institutions lower the barriers to entry, increase investment, and a large amount of funds enter the real estate market. Raise housing prices. Investors continue to expand the leverage ratio through the leverage effect of mortgage loans, leading to rising real estate prices. Under this rising trend, ordinary residents have

entered the real estate market one after another, continuing to push up real estate prices. In this round of real estate growth cycle, mortgaged real estate and real estate accounted for a large proportion of the assets of financial institutions. The rise in land prices and housing prices has significantly improved the asset quality of financial institutions and increased their profits. Therefore, financial institutions have developed a greater dependence on the real estate market, enticing financial institutions to continuously expand the supply of credit to all parties involved in the real estate market, which in turn leads to a new round of housing prices, and gradually makes real estate prices deviate from the true level.

5. The empirical analysis

Variable selection

(1) Explained variable: This paper studies the relationship between financial leverage ratio and real estate price fluctuations, and the explained variable is real estate price. In order to eliminate the influence of the statistical caliber of new and second-hand houses, the ratio of the sales volume of commercial houses to the sales area of commercial houses is selected as the data of the price of commercial houses in this paper, and P is used as the substitution.

(2) Explanatory variable: the main explanatory variable is the financial leverage ratio. According to the above analysis, the financial leverage ratio is divided into the financial leverage ratio of the residential sector LRP and the financial leverage ratio of the enterprise sector LRE. Among them, the financial leverage ratio of the residential sector is the ratio of the loan balance of the residential sector to GDP, and the financial leverage ratio of the corporate sector is the ratio of the loan balance of non-financial enterprises to GNP.

(3) Control variables: real estate prices are affected by supply and demand. From the perspective of the supply side, cost is an important factor affecting the price of commercial housing. Based on the research results of Liu (2013) and Nichols (2013), land price is selected as the control variable of the supply side of real estate, and LP is used as the substitute. From the demand side, there are many factors affecting the price of commercial housing, mainly including GDP, per capita disposable income, population, demographic structure, etc. In consideration of the convenience and representativeness of data acquisition, this paper chooses GDP as the control variable of the demand side and uses GDP as the substitute.

Data source and processing. According to the original intention of this study, distinguishing the first, second, third and fourth-tier cities is more helpful for in-depth analysis of the impact of financial leverage ratio changes on real estate prices. However, due to statistical problems, it is difficult to obtain complete data for relevant indicators. In order to ensure the accuracy and integrity of the data, this paper considers the impact of financial leverage ratio on housing prices from the provincial level. The research object is 1 provincial region. Considering the frequency of data statistics, this paper chooses annual data from 2007 to 2020 as the research object, and the data related to price indicators are all based on 2007 for the relevant constant price processing. In order to eliminate the multicollinearity problem, all the absolute numbers (price, GDP) data are processed logarithmically (the specific process is omitted). The data in this paper are from Wind Information Database.

(2) Model construction and analysis

Model construction. The previous article has described the impact of financial leverage ratio on the real estate market from the current situation and theory. In order to further determine the impact of financial leverage ratio on the housing price, this part constructs a panel data model to conduct an empirical analysis of the relationship between the two. The model is as follows:

$$P_{rt} = \alpha_0 + \alpha_1 LRP_{rt} + \alpha_2 LRE_{rt} + \alpha_3 LP_{rt} + \alpha_4 GDP_{rt} + \mu_{rt}$$

$$r=1,2,\dots,N; t=1,2,\dots,T \quad (1)$$

Wherein, P_{rt} represents the selling price of commercial housing in t period of r province; LRP_{rt} represents the financial leverage ratio of the residential sector in T period of R province; LRE_{rt} said R province t period of real estate development enterprise sector finance Leverage; LP_{rt} and GDP_{rt} are respectively represented as the land transaction price and GDP of R province in t period, μ_{rt} is the random error term.

Descriptive statistics of data. The descriptive statistical results of variables involved in this paper are shown in Table 1:

Table 1 Descriptive statistical results of variables

Variable	Mean	Std	Max	Min
P	8.58	4.31	30.29	2.89
LRP	28.54	14.34	67.88	11.29
LRE	57.80	47.04	110.34	41.36
LP	6.59	17.44	63.37	0.89
GDP	9.73	10.34	68.64	0.65

Tests before constructing the model. Firstly, the homogenous HT test and the heterogeneous IPS method were used to conduct unit root test for each variable (the test procedure was abbreviated) to ensure the stability of data. According to the test results, all variables have unit roots. After the first-order difference processing, the unit roots disappear, which can be modeled. Secondly, the variance inflation factor (VIF) method was used to test the multicollinearity of each variable. The test results show that there is no multicollinearity among the variables. Finally, F test and Hausman test are used to determine the model form (the test process is omitted). The results show that the model of individual and time bimixed effect should be constructed.

Result analysis. Through the above tests, the panel data model results are shown in Table 2.

Table 2 Regression results of panel model

Variable	Equation1	Equation2	Equation3
LRP	0.64*** (-15.2)	0.59*** (-12.7)	0.52*** (-14.5)
LRE	0.28** (-23.5)	0.23* (-17.6)	0.21** (-11.5)
LP		0.14** (-0.92)	0.12** (-0.68)
GDP			0.07** (-0.43)
Constant	592.6*** (-233.8)	1342.4*** (-184.3)	1642*** (-146.8)
Fixed region	Y	Y	Y
Year fixed	Y	Y	Y
R2	0.642	0.698	0.705
Hausman	***	***	***

Judging from the results, the residents department financial leverage and corporate sector financial leverage really has a great influence on real estate prices, financial leverage every one percent increase in which residents department, commercial housing prices rose 0.52%, the corporate sector financial leverage every one percent increase, commercial housing prices rose 0.21%. It can be seen from the results that the financial leverage ratio can effectively push up the housing price, which proves the status quo above and the results of theoretical analysis. In addition, from the point of control variables, as the control variables are added to the financial leverage effect on real estate prices weakened, but in the control variable itself, although its impact on real estate prices was statistically significant, but the impact strength obviously far less than the impact of financial leverage, in particular, every one percent increase of land price, Will drive up house prices by 0.12%; Every one percentage point increase in GDP pushes up the price of commercial housing by 0.07 percentage points.

In order to get the different performances of the influence of financial leverage ratio on real estate prices in different regions, this part establishes the panel models of the eastern, central and western regions, and analyzes each group respectively. The results are as follows (the preliminary inspection process is brief).

Table 3 Regression results of panel model

Variable	Equation1	Equation2	Equation3
LRP	0.68*** (-13.8)	0.49*** (-13.4)	0.46*** (-16.3)
LRE	0.36** (-22.5)	0.28* (-18.4)	0.16** (-13.6)
LP	0.19** (-1.02)	0.15** (-0.92)	0.08** (-0.68)
GDP	0.15** (-0.93)	0.09** (-0.63)	0.05** (-0.43)
Constant	1779*** (-133.8)	1532.4*** (-154.3)	1642*** (-146.8)
Fixed region	Y	Y	Y
Year fixed	Y	Y	Y
R2	0.682	0.728	0.745
Hausman	***	***	***

The model results show that the real estate price changes in the eastern, central and western regions are all affected by the financial leverage ratio, but the degree of "leverage effect" is different. In the eastern region, financial leverage has significant impact on the real estate price changes and changes in financial leverage each resident department 1%, house prices rose 0.68%, the corporate sector financial leverage a 1% increase, prices rose 0.36%, residents department of financial leverage on the impact of price changes than corporate sector financial leverage. In the central region, the financial leverage ratio also has a certain influence on the change of real estate prices. For every 1% increase in the financial leverage ratio of the residential sector, the housing price will change by 0.49 percentage points, while for the enterprise sector, the financial leverage ratio will change by 1%, and the housing price will change by 0.29 percentage points in the same direction. In the western region, a 1% change in the financial leverage ratio of the residential sector will lead to a 0.46% increase in the housing price, and a 1% increase in the financial leverage ratio of the corporate sector will lead to a 0.16

percentage point change in the housing price. In conclusion, both the financial leverage ratio of the residential sector and the financial leverage ratio of the enterprise sector have the strongest impact on the housing price in the east, followed by the central region and the weakest in the west. In addition, no matter in the eastern, central or western regions, the financial leverage ratio of the residential sector has a stronger impact on the housing price than the financial leverage ratio of the enterprise sector.

6. Conclusions and policy recommendations

(1) Main conclusions

First, financial leverage has a greater impact on real estate prices. The increase in financial leverage can significantly increase the sales price of commercial housing, and the role of financial leverage in the residential sector is greater than that of the corporate sector. Other influencing factors such as land prices and GDP representing both ends of the real estate market's supply and demand. Although their impact on real estate prices is also significant, their impact is still far smaller than the financial leverage ratio.

The main reason for the fluctuation of real estate prices is the change of financial leverage ratio. The real estate price changes in my country's east, middle and west regions are all affected by changes in financial leverage, but the degree of "leverage effect" varies. Whether it is the financial leverage ratio of the residential sector or the corporate sector, the impact on housing prices is the strongest in the east, followed by the central region, and the weakest in the west. In addition, whether in the whole country, or in the eastern, central and western regions, the impact of the financial leverage ratio of the residential sector on housing prices is greater than that of the corporate sector. The leverage ratio is stronger.

(2) Policy recommendations

The first is to promote the establishment of a long-term mechanism for real estate market regulation and control to form a reasonable expectation of housing prices. Government departments should give full play to the main responsibility of real estate market management, adhere to the policy orientation of "no speculation in housing and housing", and comprehensively use various policy means to promote the establishment of a long-term mechanism for real estate market regulation. On the one hand, strengthen the management and control of the land supply plan and the supervision of the provided land to prevent real estate companies from hoarding land and arbitrarily increasing prices; on the other hand, it is necessary to strengthen the construction of the real estate information system, and earnestly grasp the scale of stock houses and houses under construction, etc. Various types of information, and timely information disclosure; in addition, it is necessary to promote the "destocking" of the real estate market in an orderly manner, accelerate the construction of shared property housing, affordable housing, etc., to meet multi-level housing demand, stabilize housing prices, and prevent The sharp rise and fall of the irrational drive for residents' housing purchase behavior.

The second is to comprehensively use a variety of control measures to keep the financial leverage ratio at a reasonable level. Strengthen the supervision of the financial leverage ratio of various market entities. For real estate companies, it is necessary to strengthen their liquidity management to ensure that they have moderately sufficient cash flow to maintain development. Learn from foreign experience, explore the development of financing models such as equity financing and trust financing, expand the financing sources of real estate companies, and better respond to capital risks. Strictly review the source of the lender's down payment funds, regulate the use of consumer loans, and prevent personal comprehensive consumer loans from flowing into the real estate market.

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