ZIBELINE INTERNATIONAL™ PUBLISHING

ISSN: 2616-5155 (Online)
CODEN: MECJBU

Malaysian E Commerce Journal (MECJ)

DOI: http://doi.org/10.26480/mecj.02.2021.51.54

REVIEW ARTICLE

ON THE IMPACT OF REAL ESTATE PRICES ON THE DEVELOPMENT OF REGIONAL ECONOMY IN CHINA--AN ESTIMATION BASED ON PANEL QUANTILE REGRESSION MODEL

Baili Zhang[a], Yadong Ma[b,*], Mengyue Yin[c], Zhengxun Li[c]

[a]Anhui Jiaokong Information Industry Co., LTD, Hefei, Anhui 230088,China
[b]Academician Workstation of Tangshan Ruichi Technology Co., Ltd, Tangshan, Hebei 063299, China
[c]School of Economics and Management, Beijing Information Science and Technology University, Beijing 100192, China

ARTICLE DETAILS

Article History:

Received 04 August 2021
Accepted 10 September 2021
Available online 14 October 2021

ABSTRACT

The paper analyzes the mechanism of real estate prices on economic development with panel quantile regression model. It is found that real estate prices can significantly promote economic development. Generally speaking, the contribution of real estate prices to economic development in regions with higher level of economic development is higher than that in regions with lower level. With the continuous improvement of the quantile, the impact of real estate prices has generally increased gradually, and the impact of urbanization level basically shows the law of diminishing marginal effect.

KEYWORDS

Real Estate Prices; Economic Development; Panel Quantile Regression Model.

1. INTRODUCTION

At the 15th meeting of the Central Financial and Economic Leading Group in 2017, Xi Jinping, the General Secretary, proposed that we should firmly grasp the strategic position of "houses are for living, not for speculation" and establish a long-term mechanism to promote the stable and healthy development of the real estate market. The impact of real estate prices on regional economic development becomes a heated topic of discussion for a second time. The real estate industry is involved in the fields of production, consumption and circulation, which is closely related to people's livelihood (Pandey et al., 2018). It is generally believed that high property prices can not only drive the development of the real estate industry, but also drive the prosperity of more than 60 industries closely related, such as construction companies, architectural design institutes, supervision companies, etc. The development of the real estate industry can be described as having a significant impact and making great contributions to the sustainable development of China's economy. However, some regions rely too much on the real estate industry for economic growth. Once frustrated, it will easily lead to economic downturn. In addition, the overheated real estate industry will easily lead to the influx of funds into the real estate market, which will inevitably damage the real economy and hinder the sustainable development. Therefore, whether there is a relationship between real estate prices and regional economic development and what the real estate prices are at different levels of economic development have become the urgent problem to be solved. This paper uses panel quantile regression model to conduct empirical analysis, hoping to stabilize economic development by exploring the relationship between real estate prices and economic development, and to provide reference for the reasonable formulation of real estate prices.

2. LITERATURE REVIEW

Many experts and scholars have done various research on the relationship between real estate prices and economic development. There are three main points of view. The first is that real estate prices have a positive role in promoting economic development. Liu and Hu used the Sys-GMM model estimation method to study the dynamic impact of real estate prices on the real economy finding that real estate prices change in the same direction as the real economy (Liu and Hu, 2018). Wang believes that the real estate industry has played a leading role in the stable development of China's market economy (Wang, 2017).

The second point of view is that the effect of real estate prices on economic growth is to inhibit or not significant (Biswas et al., 2017). Gelain et al. found that excessive rise in real estate prices would lead to excessive capital flow to the real estate industry (Gelain et al., 2012). The unreasonable allocation of funds might finally cause irrational economic situation. Yuan believed that the soaring real estate bubble reduced the room for real estate expansion and posed a great threat to the sustained and stable economic growth (Yuan G.M., 2013). Chen et al. found that rising housing prices would increase labor costs, and reduced enterprise profit margins, thus inhibiting economic growth with the per capita land purchase area of real estate enterprises as the tool variable of housing price (Chen et al., 2018).

The third view holds that the impact of real estate prices on economic development is nonlinear. Duan et al. used panel smooth transition model to study the relationship between real estate prices and economy in China based on panel data of 31 provinces from 2000 to 2014 (Duan et al., 2016). The results showed that the impact of price growth rate of real estate on

Quick Response Code	Access this article online	
	Website: www.myecommerecejournal.com	DOI: 10.26480/mecj.02.2021.51.54

Cite the Article: Baili Zhang, Yadong Ma, Mengyue Yin, Zhengxun Li (2021). On The Impact of Real Estate Prices on The Development of Regional Economy in China--An Estimation Based on Panel Quantile Regression Model. *Malaysian E Commerce Journal, 5(2): 51-54.*

economic growth was affected by the credit growth rate. When the credit growth rate is lower than 28.74%, the impact is significantly positive, whereas, the price growth rate has obvious blocking effect. Luo and Xie found that change of housing prices will have asymmetric impact on the economic system (Luo and Xie, 2018). Larger changes will have greater impact on the economy than smaller changes in housing prices.

In general, the research on the relationship between real estate prices and economic development has achieved many achievements with certain theoretical and practical significance. However, the regional economic development has been unbalanced for a long time, and the existing researches mainly focus on the mean distribution without the regional heterogeneity being considered, so it is easily affected by extreme outliers (Mal et al., 2017). There is a lack of literature on the contribution of real estate prices at different levels of economic development. Based on the panel data of 31 provinces and cities from 2000 to 2017, the paper analyzes the relationship between real estate prices and economic development with panel quantile regression model, aiming to obtain their dynamic mechanism providing theoretical basis and data support for future research.

3. Theoretical Analysis

Based on the existing literature and the characteristics of the real estate industry and economic development, this paper holds that there is a great correlation between the real estate industry and economic development, which is mainly reflected in the following two aspects.

3.1 The interactive relationship between the real estate industry and economic development

Real estate prices have distinct regional characteristics. When the real estate industry is relatively prosperous, real estate prices will rise steadily, which will lead to further inflow of external funds into the real estate industry, thus driving the development of related industries. Economic development will accelerate and residents' income will increase, leading to the demand increased. On the contrary, the growth rate of real estate prices will slow down or fall when the real estate industry is in recession. And the enterprises will reduce their investment and output, thus leading to slow economic development.

3.2 The impact of real estate prices on economic development

The meeting of the Political Bureau of the CPC Central Committee put forward the objective of "resolutely curbing the rise in house prices" in the plan of economic work in the second half of 2018 to. Local governments subsequently launched special actions to control the chaos in the real estate market to ensure stable and healthy economic development. Due to its dual nature of residence and investment, the rapid development of the real estate industry can bring many new industries, thus attracting the inflow of talents and funds further stimulating the economic development.

The soaring real estate prices not only bring huge profits to developers, but also cause the economy to rely excessively on the real estate industry. In 2018, the Chinese Think Tank exclusively released a data report on the dependence of GDP on real estate investment in 30 key cities in the country, showing that about half of the cities depended more than 20% on real estate investment. The relative prosperity of the real estate industry has reduced the consumption demand of other industries, especially the high house prices will have crowding-out effect on consumption. However, if the real estate prices fall too sharply, the financial risks will increase, which will not only cause shocks to the real estate industry, but also be detrimental to the investment confidence of consumers. The real estate industry should be controlled effectively and the direction of funds should be rationally allocated to match the macro-economic development.

4. Variable Definition and Model Setting

4.1 Variable definition

Based on the rationality and availability of the data, the panel data of 31 provinces and cities in China from 2000 to 2017 are taken as research samples. The data are all from China Statistical Yearbook and China Economic Network Statistical Database of the corresponding years. Some missing values are filled by interpolation. The abbreviations and definitions of variables can be seen in Table 1.

Table 1: Abbreviations and definitions of variables

Variable type	Variable name	Variable symbol	Variable definition
Interpreted variables	Economic development	ln*pgdp*	Natural logarithm of per capita GDP of provinces and cities
Explanatory variable	Real estate prices	ln*rep*	The average selling price of commercial housing in different regions is taken as natural logarithm
control variable	Investment in Fixed Assets	*fix*	The proportion of fixed assets investment in GDP in the whole society
	Openness	*open*	The proportion of total import and export to GDP
	Urbanization	*urb*	The proportion of non-rural population in the total population
	Financial deepening	*jrsh*	The proportion of deposit and loan balance of financial institutions to GDP
	Employment	*epm*	Employment/total population

4.2 Model setting

The theory of "Quantile Regression" was put forward (Koenker and Bassett, 1978). Its principle is to study the relationship between the explanatory variable and the explained variable based on the conditional distribution to be explained. The regression curves are different in different quantiles. Compared with the traditional regression model, it reflects the relationship between variables more comprehensively. As China is a vast country with large differences in economic development and real estate prices between regions, the panel quantile regression model is more suitable. According to the previous analysis, the basic model is constructed as follows:

$$Lnpgdp_{i,t} = \alpha_0 + \alpha_1 Lnrep_{i,t} + \alpha_j x_{j,i,t} + \mu_{i,t} \quad (1)$$

In formula (1), *Lnpgdpi,t* is the per capita GDP considering population factors of each region at some years. *Lnrepi,t* is the core explanatory variable-the industrial structure. xi,t is other control variables affecting economic development, such as fixed asset investment, openness, urbanization level and financial deepening (Christata and Daryanto, 2020). $\mu_{i,t}$ is a residual term.

Figure 1 depicts the scatter distribution of real estate prices and economic development and the fitting situation of linear and quadratic terms in 527 samples. It can be seen that the economic development has an upward trend with the change of the real estate prices, and there is no obvious curve track for the quadratic terms fitting. Therefore, it is assumed that there is a linear relationship between real estate prices and economic development.

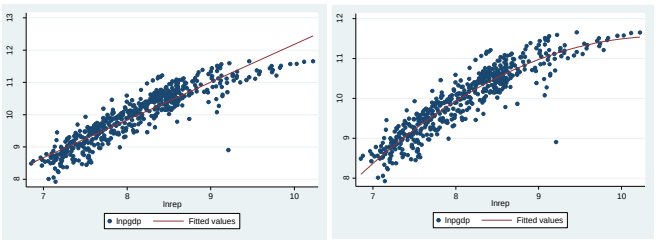

Figure 1: Scatter distribution of real estate prices and economic development and the fitting diagram of linear and quadratic terms

5. The Empirical Analysis of The Impact of Real Estate Prices on Economic Development

5.1 Test of panel stability

Considering the applicability of various methods, LLC, HADRI and HT are used to test the stability of the selected variable, and the test results can

be seen in Table 2. It is generally believed that the variable is considered to be stable as long as the test results of more than two of these three test methods show stable.

Table 2: Unit root test

variable	LLC	P value	HADRI	P value	HT	P value	Test result
lnpgdp	-1.8172	0.0346	24.4586	0.0000	0.9776	0.0615	stable
lnrep	-7.4831	0.0000	13.7428	0.0000	0.4196	0.0000	stable
fix	-1.4589	0.0723	17.7073	0.0000	0.9859	0.1662	stable
open	-1.3605	0.0868	7.7012	0.0000	0.5676	0.0000	stable
urb	-1.4993	0.0669	17.6151	0.0000	0.9402	0.0000	stable
jrsh	-2.6512	0.0040	18.2844	0.0000	0.4641	0.0000	stable
emp	-7.6927	0.0000	19.0859	0.0000	0.2680	0.0000	stable

5.2 Results analysis of fixed effect model

For Hausman test, the P value is less than 0.001, so it is more appropriate to select the fixed effect model. For convenience of comparison, a mixed effect model is added, and the estimation results are shown in Table 3.

Table 3: Empirical results

variable	OLSModel	FE model	Stability test model
ln*rep*	0.908***	0.941***	0.932***
	(13.57)	(10.59)	(10.39)
fix	0.647***	0.933***	0.908***
	(7.59)	(6.27)	(5.98)
open	0.172**	-0.00771	-0.0223
	(2.03)	(-0.19)	(-0.59)
urb	1.433***	0.254	0.251
	(4.58)	(0.67)	(0.66)
jrsh	-0.478***	-0.209***	-0.214***
	(-7.81)	(-3.01)	(-3.09)
emp	/	/	0.375**
	/	/	(2.71)
_cons	1.894***	1.842***	1.729***
	(4.93)	(3.32)	(3.08)
N	558	558	558
adj. R^2	0.8877	0.9306	0.9313
Hausman test	/	56.26 (0.0000)	55.51 (0.0000)
F	/	300.05 (0.0000)	235.51 (0.0000)

Note: t value in parentheses, *, ***, *** were significant at 10%, 5% and 1% respectively.

As shown in Table 3, the impact of real estate prices on economic development is significantly positive, which indicates that real estate prices can promote economic development at this stage. The elasticity coefficient is 0.941. For every 1% change in real estate prices, economic growth will correspondingly change by 0.941%. As for control variables, the impact coefficient of fixed asset investment on economic development is significantly positive, while the impact of industrial structure is negative (Brzeziski, 2018). The stability test is conducted by adding the employment level (expressed as the proportion of employed population in the resident population). The results show that the explanatory variable coefficients of the two models were basically the same, indicating that the research results above were reliable.

5.3 Estimation results of panel quantile regression model

In order to more intuitively show the change of the regression coefficient of real estate prices with the quantile changing, a chart showing the change of quantile regression coefficient is made by stata15.0 in Figure 2. The quantile estimation results of industrial structure are shown in Table 4. According to Figure 2 and Table 4, the impact of real estate prices on economic development shows an upward trend with the continuous increase of quantile in the range of 0.1-0.9.

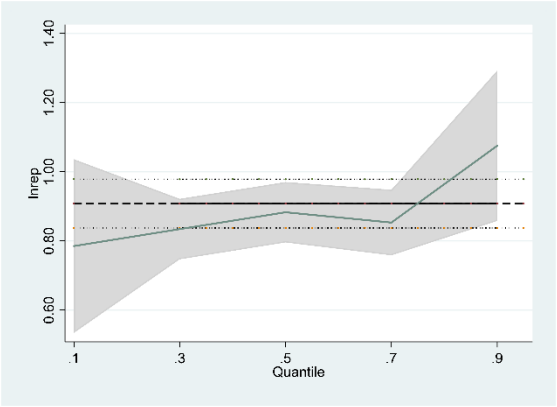

Figure 2: The change of quantile regression coefficient

Table 4: The panel quantile regression results of real estate prices

variable	10%	30%	50%	70%	90%
lnrep	0.616***	0.813***	0.827***	0.947***	1.068***
	(6.83)	(101.89)	(21.03)	(51.12)	(55.6)
fix	0.548***	0.668***	0.591***	0.733***	0.419***
	(4.13)	(29.87)	(12.23)	(11.79)	(12.88)
open	-0.190**	0.0174*	0.163***	0.0484	0.246***
	(-2.34)	(1.75)	(3.07)	(1.29)	(21.5)
urb	2.255***	1.676***	1.120***	1.253***	0.452***
	(7.89)	(10.8)	(10.45)	(8.24)	(6.24)
jrsh	-0.302***	-0.232***	-0.351***	-0.344***	-0.459***
	(-3.82)	(-5.80)	(-7.44)	(-5.62)	(-21.48)

Note: t value in parentheses, *, ***, *** were significant at 10%, 5% and 1% respectively.

Through the results of panel quantile regression in the Table 4, it can be seen that real estate prices have a significant and positive effect on economic development in each quantile, proving that the prosperity of the real estate industry has contributed great to the economic development in recent ten years. In general, with the continuous development of economy, the impact of real estate prices is gradually increasing. Specifically, for every 1% increase in real estate prices, the regional GDP per capita will increase by 0.616% to 1.068%, showing that the coefficient varies greatly in different quantiles. Real estate prices in regions with a lower level of economic development have less impact on the economy than those with a higher level. The higher the level is, the stronger the promotion effect. The reason may be that regions with a higher level of economic development are more able to attract talents, while the prosperity of the real estate industry has stimulated the development of related supporting industries and stimulated the consumption behavior of residents. On the contrary, the regions with a low level of economic development have to insufficient attraction to talents and investment. The blind increase in real estate prices is likely to hinder the economic development.

The elasticity coefficient of fixed asset investment has passed the significance test at the level of 1% in each quantile, and the difference is small with the increase of quantile, indicating that fixed asset investment is an important source of funds for local government construction that cannot be ignored.

The elasticity coefficient of openness has passed the test except 70% of the quantile level. The coefficient is significantly negative for 10% of the quantile level, while positive for the rest of quantile level. It may be that enterprises in regions with a low level of economic development are less competitive. When trading with foreign countries, local enterprises will be impacted by foreign capital and products, thus adversely affecting the local economy.

The elasticity coefficient of urbanization level has passed the significance test and the relationship between urbanization and economic development basically presents the law of diminishing marginal effect with the increase of the quantile level. It shows that urbanization reform has achieved results in areas either with a higher level of economic

development or with a lower level in the past ten years. However, the multiplier effect and agglomeration effect brought by urbanization in regions with a higher level of economic development and urbanization are not as good as those in regions with a lower level.

The financial deepening has passed the significance test with its coefficients being negative, indicating that the contribution of financial deepening to economic growth is significantly negative (Xu and Xia, 2014).

6. Conclusions and Suggestions

Based on the panel data of 31 provinces and cities from 2000 to 2017, the paper analyzes the impact of real estate prices on economic development with Fixed Effect Model, finding that real estate prices can significantly promote economic development. And then it uses panel quantile regression model to empirically study the mechanism of real estate prices in regions with different levels of economic development. Generally speaking, the impact of real estate prices on economic development is gradually increasing with the improvement of the economic development level. The relationship between urbanization and economic development basically shows the law of diminishing marginal effect. Financial deepening will inhibit economic development.

According to the research results, the paper puts forward the following considerations:

(1) Formulate various policies to carry out macro-control on real estate prices. There are many factors that will affect real estate prices, requiring the coordination of various policies including credit policies and tax policies. The government should strengthen the control over the inflow of real estate funds, guide the orderly and healthy development of the market, and prevent the generation of price bubbles and overheating of the economy.

(2) Curb investment and guide the return to the attribute of "no speculation in housing". The real estate industry has a huge demand for capital. The capital of the openers mainly comes from commercial banks. Their development is limited by their financing ability. Government departments should limit the overseas issuance of bonds by real estate enterprises to prevent the overheating of real estate investment from the source of funds and fulfill the residential function, thus achieving the purpose of controlling house prices and promoting the economy to develop stably.

(3) Adjust measures to local conditions and implement differentiated management of real estate prices. For regions with different levels of economic development, different strategies for managing real estate prices should be adopted. For economically prosperous areas, the government should push forward the supply-side reform of the real estate market to effectively curb speculation and reduce the dependence on the real estate market. Constantly cultivate and develop the real economy and promote the healthy and orderly development of the economy. For regions with a lower level of economic development, the government should base itself on market supply and demand to promote the development of related industries to improve supporting services for real estate, speed up the process of urbanization, and attract population to gather from rural areas to towns to increase the housing supply.

References

Biswas T., Saha A. and Saha D., 2017. DTMF and GSM based home automation system, Advances in Industrial Engineering and Management 6(2), 111-116.

Brzeziski D.W., 2018. Review of numerical methods for NumILPT with computational accuracy assessment for fractional calculus, Applied Mathematics and Nonlinear Sciences 3(2), 487-502.

Chen B.K., Huang S.A. and Ouyang D.F., 2018. Can rising real estate prices promote economic growth? Economics (Quarterly) 17(3), 1079-1102.

Christata B.R. and Daryanto Y., 2020. A systematical review on the economic order quantity model with carbon emission: 2010-2020, Advances in Industrial Engineering and Management 9(2), 20-26.

Duan J., Zeng Q. and Zhang L.T., 2016. Nonlinear relations between bank credit, real estate price and economic growth: Empirical test based on inter-provincial panel smoothing conversion model, Financial Theory and Practice 37(4), 18-24.

Gelain P., Lansing K.J. and Mendicino C., 2012. House prices, credit growth, and excess volatility: Implications for monetary and macroprudential policy, Working Paper Series (9), 219-268.

Koenker R. and Bassett G.W., 1978. Regression quantiles, Econometrica 46(1), 211-244.

Liu Y.J. and Hu J.B., 2018. Dynamic impact of real estate price on real economy fluctuation: empirical analysis based on Sys-GMM model, Finance and Economics Science (4), 75-85.

Luo Z.Y. and Xie H.B., 2018. Does the fluctuation of real estate price aggravate the economic fluctuation: from the perspective of financial accelerator and on the premise of resolutely curbing the rise of house price to maintain the steady and healthy development of real estate market, Shanghai Finance (12), 46-52.

Mal S., Mondal A., Podder A. and Chowdhury A., 2017. 7-Segment decoder in near threshold regime for ultra low power application, Advances in Industrial Engineering and Management 6(1), 37-42.

Pandey P.K. and Jaboob S.S.A., 2018. A finite difference method for a numerical solution of elliptic boundary value problems, Applied Mathematics and Nonlinear Sciences 3(1), 311-320.

Wang J., 2017. Real estate prices, credit constraints and macroeconomic interaction mechanism, Macroeconomic Management (S1), 344-345.

Xu J.B. and Xia H.Y., 2014. Financial development and economic growth: Is government intervention important, Economic Issues (7), 41-47.

Yuan G.M., 2013. Taking the road of healthy development of the real economy and opening up a new era -- Reverse the dilemma, the real estate bubble is coming to an end, Theory and Practice (1), 10-14.

Cite the Article: Baili Zhang, Yadong Ma, Mengyue Yin, Zhengxun Li (2021). On The Impact of Real Estate Prices on The Development of Regional Economy in China--An Estimation Based on Panel Quantile Regression Model. *Malaysian E Commerce Journal, 5(2): 51-54.*