Research on the relationship between investment in real estate development and fiscal revenue in Underdeveloped Areas——Take Heyuan as an example

Yingchao Bai
(College of Business Administration, Heyuan Polytechnic, Heyuan, Guangdong, 517000, China)

Abstract. This paper is based on the statistical data of real estate development investment and general budgetary revenues of local finance in Heyuan from 2001 to 2016. After that, Eviews6.0 software is used to analyze the long-term equilibrium relationship between real estate development investment and fiscal revenue through co-integration analysis. Finally, this paper proposes that the real estate industry in Heyuan should proceed from the aspects of real estate diversification, the construction of the new area of Jiangdong, the improvement of housing security and the improvement of public service, so as to realize the sustainable and healthy development of the real estate industry.

1. Introduction
Heyuan is a mountainous city in northeastern Guangdong Province, which is an economically underdeveloped area. In terms of location, Heyuan is located close to Huizhou, located in the two hour economic circle of Shenzhen, located in the back garden of Shen-Guang-Hui. With the start and completion of Gan-Shen high-speed railway and Hang-Guang high-speed railway, the time of Heyuan to Shenzhen and Guangzhou will be shortened to forty minutes, and the advantage of location is obvious. Against this background, the real estate industry in Heyuan, especially the leisure and pension real estate, has been developing rapidly. Under the background of relatively less developed economy, it is of great significance to study the relationship between the real estate industry and the increase of financial income in Heyuan, which is of great significance to the stable growth of the financial revenue in Heyuan and the sustainable and healthy development of the real estate industry.

2. The present situation of the development of real estate industry in Heyuan
In recent years, with the entry and development of famous real estate enterprises such as Evergrande Real Estate and Country Garden, the real estate industry in Heyuan has developed rapidly, and the investment in real estate development and the sales of commercial housing are increasing rapidly. The development trend of real estate industry in Heyuan is shown in Figure 1.
Figure 1 the development trend of the real estate industry in Heyuan

As you can see from Figure 1, except for a slight drop in investment in real estate development in Heyuan in 2008, other years maintained a relatively rapid growth. The fastest growing years were in 2011, 2013, 2015 and 2016. In these years, the growth rate reached 153.73%, 32.85%, 27.53% and 36.65% respectively. From the area and sales volume of commercial housing sales, the sales area of commercial housing decreased rapidly except in 2008, 2012 and 2014.

3. Study on the relationship between investment in real estate development and financial revenue in Heyuan

3.1. Index selection

This paper selects the real estate development investment ‘X’ to represent the development of the real estate industry in Heyuan, and the general budget revenue of local finance ‘Y’ represents the development of the financial income of Heyuan. Then, by analyzing the relationship between the two indicators, the article studies the relationship between Heyuan’s real estate development investment and financial revenue. The data are from the national economic and social development bulletin from 2001 to 2016.

In this paper, the Eviews6.0 software is used to establish the regression model of Heyuan real estate development investment and financial revenue on the basis of unit root test and cointegration analysis. Then, according to the results of the model analysis, the paper explores the intrinsic relationship between real estate development investment and financial revenue.

3.2. Logarithm and stability test

In order to reduce the magnitude of data and reduce the fluctuation interference of data, this paper logarithms the time series, which are LNX and LNY respectively. The results are shown in Table 1 by using the ADF test method.

| ADF Test value | 1% significant level | 5% significant level | 10% significant level | conclusion |
|----------------|----------------------|----------------------|-----------------------|------------|
| LNX            | -1.739791            | -3.959148            | -3.081002             | Unstable   |
| LNY            | -1.293983            | -3.959148            | -3.081002             | Unstable   |
| DLNX           | -1.478547            | -4.004425            | -3.098896             | Unstable   |
| DLNY           | -4.666489            | -4.004425            | -3.098896             | stable     |
| D(DLNX)        | -2.794130            | -4.057910            | -3.119910             | stable     |

Table 1 shows that the critical value of LX and LY is less than the ADF test value under 10% significant level. Therefore, we accept the hypothesis that there is a unit root and a non-stationary sequence. After second order difference, the critical value of LNX is greater than its ADF test value.
under the significant level of 10%. After the first order difference and 10% significant level, the critical value of LNY is greater than its ADF test value. Therefore, we reject the original hypothesis that LX and LY belong to the second order stationary sequence, and the two have the possibility of cointegration.

3.3. Regression model establishment

3.3.1. Build the model. LX and LY are non-stationary time series. After cointegration regression, the relationship between the two can be established as follows:
\[
\ln Y = \beta_0 + \beta_1 \ln X + \varepsilon \quad \ldots \quad (1)
\]
Estimate its parameters by Eviews6.0's OLS method, available formula (2):
\[
\ln Y = -0.513459 + 1.273944 \ln X \\
T = (-2.949140) \quad (22.16952) \\
R^2 = 0.972304 \quad F = 491.4875 \\
D.W. = 1.367400 \quad s.e. = 234543 \quad \ldots \quad (2)
\]

3.3.2. Test the model.

3.3.2.1. Residual test. We use the Histogram-Normality Test to test residual. The residual distribution bar graph is similar to the bell shape, and the p = 0.556912 is larger than the saliency level by 0.1, which shows that the residual error of the model conforms to the normal distribution.

3.3.2.2. Autocorrelation test. The LM test is used to test the residual error of the model. The first order p value of the residual is 0.0086, far less than 1, and second order autocorrelation test, Reside (-2) does not pass the t test. It shows that the model has first-order autocorrelation, and there is no second order order autocorrelation.

3.3.2.3 Heteroscedasticity test. The test results show that under 10% significant levels, the F statistic is 0.325672, the corresponding probability is 0.5573, which is more than the significant level 0.1. Therefore, the original hypothesis is accepted and the model does not exist the problem of heteroscedasticity.

The test results show that the residual error of the regression model is in the normal distribution, and there is no heteroscedasticity problem, but there is a first order correlation, and a model correction is needed for the sub correlation problem.

3.3.3. The Model correction. Since the model residuals are related to autocorrelation, the Cochrane-Orcutt iteration method is used to correct the model (3):
\[
\left\{ \begin{array}{l}
\ln Y_t = c_0 + c_1 \ln K Y L_t + \mu_t \\
\mu_t = \varphi \mu_{t-1} + \xi_t \ldots \ldots \ldots (3)
\end{array} \right.
\]
AR model estimated D.W. = 2.232157, D.W. test critical value table can be obtained, when n = 16, k = 2, dL = 0.982, dU = 1.539, because dU < D.W. = 2.232157 < 2.461 = 4 dU, so there is no correlation, indicating that the model is effective and reliable. The estimation results of the AR model are as shown in formula (4).
\[
\left\{ \begin{array}{l}
\ln Y_t = 2.431141 + 0.038981 \ln K Y L_t + \mu_t \\
( t = 4.90917, t = 4.232182) \\
\mu_t = 0.656097 \mu_{t-1} + \xi_t \\
t = 4.710356 \quad R^2 = 0.967404, \\
F = 178.0707 \quad D.W. = 2.232157 \ldots \ldots (4)
\end{array} \right.
\]
According to the revised model, we can conclude that there is a long-term co-integration relationship between real estate development investment and financial revenue in Heyuan. The elasticity of real estate development investment to financial revenue is 0.038981, that is, the
investment of real estate development in Heyuan is increased by 1 percentage points, and local financial revenue increases by 0.038981 percentage points.

3.4. Conclusion
This paper takes the real estate development investment and the local finance general budget income as the research sample from 2001 to 2016, and establishes the co-integration regression model, and proves the long-term equilibrium relationship between the real estate industry of Heyuan and the financial income of Heyuan. There is a long-term cointegration relationship between the investment and financial revenue of real estate development in Heyuan. The development and investment of the real estate industry increased by 1 percentage points, and the local financial revenue increased by 0.038981 percentage points, indicating that the development of the real estate industry in Heyuan promoted the increase of financial revenue. However, from the absolute point of view, the impact of real estate development investment on the increase of local financial income in Heyuan is not obvious, which may be more dependent on the land transfer money than the local financial revenue in China, and the real estate development investment statistics do not include simple land transactions.

4. Suggestions on the development of real estate industry in Heyuan

4.1. Heyuan should vigorously develop real estate diversification to achieve differentiated development.
The planning and construction of Gan-Shen high speed rail, Hang-Guang high speed rail and Guang-he passenger dedicated line will shorten the time of high-speed rail between Guangzhou, Shenzhen and Heyuan to thirty and forty minutes. It is conducive to further integrating Heyuan into Shen-Guan-Hui economic circle. In addition, with the gradual release of the good two child policy, the urban family structure has changed from the original three home to the four family, and the change of the family structure will make a corresponding adjustment to the real estate structure. At the same time, under the background of accelerating population aging, the pension industry and pension related demand will surely improve.

Under this background, the real estate industry in Heyuan needs to further study the demand for home ownership in this city and the Pearl River Delta region so as to realize the diversification of development. First, based on Market Research and policy requirements, real estate enterprises should redesign their own house type. While considering the rigid demand, enterprises should also pay attention to the concerns of improving the demand under the two child policy. Second, we should seize the opportunity of Heyuan to speed up its integration into the Shen-Guan-Hui economic circle. In the aging population and high speed rail planning and opening up, we strongly support the planning and development of pension real estate. We should give full play to the natural advantages of Heyuan and make Heyuan a back garden for the elderly in the Pearl River Delta. Third, we should closely contact Heyuan's commercial development and industrial park planning. While developing residential real estate, we have planned and stepped up the development of commercial real estate and industrial real estate.

4.2. Heyuan should strive to build Jiangdong new district and speed up the development of urbanization.
As the core of Heyuan's future city development, Jiangdong new area is the focus and development direction of Heyuan city's capacity expansion and quality improvement, with high positioning, high starting point and great potential. In Heyuan, the first is to make full use of the favorable opportunities for high speed rail planning in high hope regional hub, to do a good job in the urban development and construction plan of the New District of Jiangdong, and to promote the rapid development of industrial and industrial population in the new area. Second, Heyuan needs to further improve the household system, and guide and encourage the local actual situation. The transfer of urban and rural residents to the urban areas, especially the Jiangdong new area, speeds up the development of local urbanization.
4.3 The housing security system should be perfected in Heyuan.
In view of the current status of the household registration of commodity housing, Heyuan needs to support high end and low end housing demand, guarantee and meet the demand of different levels of commercial housing, and ensure the stable development of the real estate industry in Heyuan. First, the supply of small and medium-sized apartments needs to be guaranteed in accordance with the market demand to meet the housing needs of low-income families. Second, in the context of rising housing prices, Heyuan needs to set up corresponding housing and affordable housing. At the same time, the government encourages the exploration and implementation of public procurement by the social housing government, to encourage the introduction of social capital to carry out self holding property, and to increase the supply of commercial housing in the rental market. Third, in the old city reconstruction, land expropriation and demolition, the government should guide the purchase of commodity housing in the form of housing collection and resettlement problems, encourage the residents to levy a monetaed resettlement compensation purchase stock commodity housing, and give a certain tax preference for this kind of purchase.

4.4. Heyuan should further optimize the investment environment and improve the quality of public services.
Under the background of accelerating the integration into the Shen-Guan-Hui economic circle, Heyuan's administrative departments need to further optimize the investment environment. The government departments should simplify the examination and approval process, improve the efficiency of the administrative examination and approval, and attract more Pearl River Delta enterprises to Heyuan through the promotion of soft power, and then promote the upgrading of the industrial structure of Heyuan. Through the development of industrial economy, we can achieve steady growth in fiscal revenue and achieve a virtuous circle through fiscal expenditure to ensure a good investment environment.

Acknowledgments
This work was financially supported by the 13th Five-Year Plan Subject of Social Science Association of Heyuan City (project number: HYSK17P03) and the 2016 scientific research project of Heyuan Finance Bureau (project number: HYKJ16P02).

Reference
[1] Shaoan Huang, Bin Chen and Zitong Liu August 2012 Beijing. Economic Research Journal pp 93-106.
[2] Xi Zhao and Jiguo Sun 2012 Hefei. East China Economic Management Vol.26 PP95-97.
[3] Chunhua Chang and Fayuan Wang May 2013 Taiyuan. Friends of Accounting pp61-64.
[4] Xianghua Wu, Xia Xu and Yan Xiong September 2013 Nanjing. Modern Urban Research pp 31-35.
[5] Lu Li 2017 Guangzhou. Financial Economics Research, Vol.32 pp43-51.
[6] Ran Gao and Liutang Gong April 2017 Beijing. Journal of Financial Research pp32-44.