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The Dynamic Relationship between Real Estate Investment and Economic Growth: Evidence from Prefecture City Panel Data in China

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Abstract

This paper employed GMM for the first time to estimate the dynamic relevance between real estate investment and the economic growth based on the panel data of 284 Chinese Prefecture cities from 1994 to 2010. We find that the positive effect of real estate investment on economic growth is stronger in short term while in long term turn to be negative. Therefore housing investment is an important factor for short-term economy fluctuations and lead to downside risk in the long term. The effect of real estate investment also rely on the regional economy development and has periodic characteristics, which is stronger in the eastern region than the midwest region and the negative enduring impact is strengthened after 2004. Furthermore the government expenditure hinder the economy growth and cutting government expenditure and curbing the wind of extravagance by the new leadership in China is proved to be proper.

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Keywords: Real Estate Investment; Nonreal Estate Investment; Economic Growth;Generalized Method of Moments; Dynamic Panel Data

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1. Introduction

This century the rapid development of the real estate industry become distinctive feature of economy in China. The real estate investment enhanced from 3311.98 hundred million yuan in 2000 to 44,319.50 hundred million yuan in 2011 which is 13.38 times of 2010. The growth rate is higher than the 9.36 times of the total fixed asset investment. As an important part of household spending, real estate investment is important pillar of macroeconomy. Real estate funds maybe even outnumber commercial funding [1], and [2] found that the stock of real estate in America is close to annual average GDP. On the other hand, the rapid growth of real estate industry in China cause fears. The national real estate sales price rise from 2,112.00 yuan / square meter in 2000 to 5,357.10 yuan / square meter in 2011 with the average annual growth rate up to 12.8%. And the weight of the real estate investment in GDP increase from 3.34% in 2000 to 9.37% in 2011.The over-reliance on real estate would make the national economy deviate from the healthy, stable and sustainable development. It is significant and urgent to investigate whether the effect of real estate has changed and influenced by the different regions and period during the rapid development of real estate investment over 10 years.

Most literature in econometric method employed the Granger causality test to investigate the empirical relevance between the real estate investment and the economic growth [3,4,5,6]. [3] apply the unit root test based on provinces quarter panel data in China during 1999-2007 and confirm that there is stable bi-directional causality between the real estate investment and GDP both in the short term and long term, and region differences influenced the effect significantly.[4] also hold that bi-directional causality in short-term while in short term the real estate exert stronger impact on the economic growth.[5] make the generalized impulse response analysis and variance decomposition analysis and found significant unidirectional Granger causality from GDP to real estate investment .

This paper re-evaluated the empirical relevance between real estate investment and economic growth in China based on dynamic panel data from 284 cities between 1994-2010 in China. We update the time span timely and expand the individuals greatly. That would help increase the freedom degree and overcome the small sample bias and the endogenous problem in the econometric model. On the other hand it is important to capture the timely characteristic of real estate investment and derive more reliable empirical results. In addition, there is inertia and lag adjustment process in the economic growth, this paper established dynamic model proposed in [7] and empolyed GMM to characterize this feature.

2. The econometric model, data sources and variable declaration

This paper investigated the effect of the real estate investment on economic growth under the control variables. In addition to the menu cost, there is decision lag and inertia which make the actual economic growth deviate from the equilibrium in the short run. We include the lagged dependent variable in the independent variables in the model to capture this sluggish adjustment. Furthermore the dynamic model would help overcome the endogenous problem in the model and derive more reliable results. Taking the cities heterogeneity into account, this paper consider fixed effect and set model as equation(1).

$$\begin{aligned} g_{it} &= \alpha_0 + \alpha_1 g_{i(t-1)} + \beta_1 RV_{it} + \beta_2 RV_{i(t-1)} + \beta_3 NV_{it} + \beta_4 NV_{i(t-1)} + \beta_5 H_{it} + \beta_6 L_{it} + \beta_7 U_{it} + \beta_8 open_{it} \\ &+ \beta_9 PD_{it} + \beta_{10} T_{it} + \beta_{11} G_{it} + \beta_{12} C_{it} + \eta_i + \lambda_t + \upsilon_{it} = \alpha_0 + \alpha_1 g_{i(t-1)} + \beta_1 RV_{it} + \beta_2 RV_{i(t-1)} + \beta_3 NV_{it} \\ &+ \beta_4 NV_{i(t-1)} + \sum_{j=5} \beta_j CV_{it} + \eta_i + \lambda_t + \upsilon_{it} = \alpha_0 + \alpha_1 g_{i(t-1)} + \beta X_{it}^* + \eta_i + \lambda_t + v_{it} = \delta' X_{it} + \eta_i + \lambda_t + v_{it} \end{aligned} \tag{1}$$

In which control variables $CV_{it}=(H_{it}\ L_{it}\ U_{it}\ open_{it}\ PD_{it}\ T_{it}\ G_{it}\ C_{it})$, $X_{it}^*=(RV_{it}\ RV_{it-1}\ NV_{it}\ NV_{it-1}\ CV_{it})$,