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Comparisons of the relations between housing prices and the macroeconomy in China's first-, second- and third-tier cities

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A B S T R A C T

Based on a VAR (vector auto-regression) model, we conduct an empirical study on the relations between housing prices and the macroeconomy from the perspective of China's first-, second- and third-tier cities. The results show that the interest rate has significant negative impact on housing prices, but the impact gradually decreases from first-tier to third-tier cities; the effect of inflation on housing prices is positive in the initial period and then becomes negative, and compared with that in second- and third-tier cities, the negative effect in first-tier cities is much more significant; housing prices have a positive effect on inflation, and the effect gradually increases from first-tier to third-tier cities; the influence of the macroeconomic growth rate on housing prices is generally positive in all the cities, and the strongest effect is found for first-tier cities. Based on the findings, our work can provide the government with more targeted policy recommendations, which can offer some new ideas on the regulation of the real estate market.

1. Introduction

For a long period, the real estate industry has been an important pillar industry of China's national economy, and based on international experience, it can be regarded as a barometer of the country's economic development. According to Kindleberger (2001), from the early 17th century to the 1990s, there were 42 important financial crises around the world, and 21 of them were related to booming and slumping trends in housing prices, which indicates that a close relationship exists between the real estate industry and the macroeconomy.

Since the Chinese government started real estate market reform in 1998, the market began to enter a complete commercialization stage and develop rapidly (Li, Chiang, & Choy, 2011). China's real estate market showed a booming trend from 2003 to 2013. This decade is also known as the "golden age" of China's real estate industry, which reflected the prosperity of the real estate industry. According to data from the National Bureau of Statistics, commercialized buildings sold in China covered an area of 337.18 million square meters in 2003, while this figure expanded to 1305.51 million square meters in 2013, with an annual growth rate of 14.50%. Moreover, commercialized buildings sales accounted for 795.57 billion yuan in 2003 and increased to 8142.83 billion yuan in 2013, with an average annual growth rate of 26.19%. Real estate investment also rose from 1015.38 billion yuan in 2003–8601.34 billion yuan in 2013, at an average annual growth rate of 23.82%. These figures show the rapid development of China's real estate industry in recent years. As the real estate industry has been developing quickly, China's economy has made remarkable achievements. China's GDP was only 13.66 trillion yuan in 2003, while it reached 58.80 trillion yuan in 2013. The average annual growth rate was 15.72% during these years (Fig. 1). In the rapid development of China's economy, the real estate industry has played an important role. According to the 2012 *China's Top 100 Real Estate Enterprises Research* published by the China Index Academy, from 2003 to 2012, the rate at which China's real estate industry contributed to GDP growth was about 10%, and the real estate industry helped increase the GDP by 1.5–2 percentage points on average each year.

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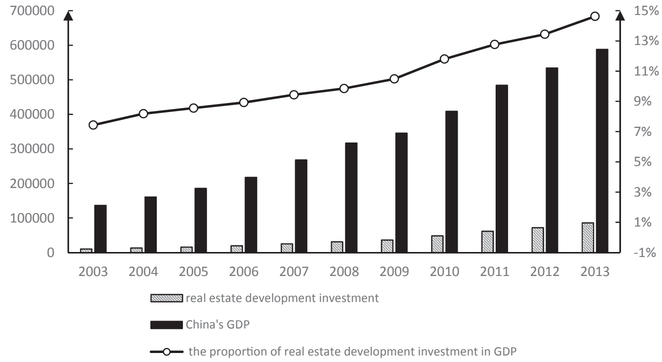

Fig. 1. Real estate development investment and GDP of China (2003–2013).

Therefore, we can see that China's real estate industry has close relation with China's macroeconomy.

With China's economy entering its "new normal",[1] there appear to be some new changes in the development trends experienced by China's many industries, including, of course, the real estate industry. Since 2014, China's real estate climate index has declined month by month. The real estate market has become very sluggish. In 2014, national real estate investment grew 10.5% year over year, and this is the lowest level in the past decade. In addition, the area of new started buildings fell 10.7% from the year earlier, which also represents the lowest level in the past decade. Therefore, the real estate industry has gradually bid farewell to its "golden age", as the pace of growth has declined and the rational recovery has appeared in the market. The real estate market is in a critical period for recognizing and adapting to the "new normal". A noteworthy topic therefore concerns how coordinated development of the real estate industry and the macroeconomy can be achieved in the "new normal". Analysis on the relationship between the housing prices and the macroeconomy is thus necessary.

Existing studies on this topic have mostly analyzed the relation between housing prices and the macroeconomy from the perspective of the overall real estate market, and there is almost no research based on further segmentation of the real estate market according to different city tiers. However, real estate market segmentation has existed in China for a long time. It is inappropriate to explore the relation between housing prices and the macroeconomy on the basis of the national market, as the economic environments and real estate markets in the first-, second- and third-tier cities[2] in China are quite different. Generally, the city tiers in China are based on some key characteristics of cities, such as their economic development, transportation system, infrastructure and cultural significance. Based on these criteria, China's cities can be divided into different tiers. Because of the constant influx of the population and capital, first-tier cities are characterized by high-quality resource aggregation and extensive purchasing needs, and the real estate markets in such cities are supported by rigid demand.[3] In the second-tier cities, the market is not as hot as that in the first-tier cities; however, there are more opportunities for development, and many second-tier cities have pillar industries of considerable influence and convenient transportation. As a result, second-tier cities substantially benefit from China's urbanization process, which helps the real estate markets in these cities. As for the third-tier cities, their populations usually are less than 1 million; therefore, the real estate market capacities are small. Meanwhile, the levels of economic development and market consumption in third-tier cities are lower than those in first- and second-tier cities. The differences between first-, second- and third-tier cities are also obvious in statistical data. Take the housing sales price statistics of 70 cities for July 2015, as published by the National Bureau of Statistics of the People's Republic of China, for example. All the housing prices in first-ties cities rose from the previous month, and in most second-tier cities, housing prices increased more slowly than those in first-tier cities, while, the housing prices still decreased in most third-tier cities. Based on these statistics, we hold the view that the relation between housing prices and the macroeconomy in different tiers of cities is quite different; therefore, we should discuss the relation between housing prices and the macroeconomy separately for first-, second- and third-tier cities. To our knowledge, this is the first paper to analyze the relation between housing prices and the macroeconomy from the perspective of comparisons among different tiers of cities. Therefore, our study can contribute to filling a gap in research on the relation between housing prices and the macroeconomy. In addition, our study can also benefit real estate companies and the government in China. Real estate companies are provided with a reference for making development strategies in different tiers of cities, and the government can try to harmonize the development of both the real estate industry and the macroeconomy based on information in this article.

The remainder of the paper is structured as follows. The second section discusses previous studies related to this research in literature review. In the third section, we conduct a theoretical analysis regarding the relations between housing prices and key macroeconomic variables. In the fourth section, we use monthly data from July 2005 to June 2015 to estimate our VAR (vector autoregression) model in order to study the relationships between housing prices and the macroeconomy in first-, second- and third-tier cities. Conclusions and suggestions are provided in the fifth section.

2. Literature review

In research on the relation between the macroeconomy and the real estate market, there have been some achievements. For instance, previous scholars have studied the relationship between macro policy and the real estate market based on monthly data from South Korea for the period from 1991 to 2002. Cho and Ma (2006) use a co-integration test and spectral analysis to study the relationship between housing prices and interest rates, and the results show that there is a long-term negative relationship between housing prices and interest

[1] The phrase "new normal" gained ground in China in May 2014, when Chinese President Xi Jinping used this term during an inspection tour in Henan province of China. The concept of "new normal" means not only slower economic growth in China, but more importantly, improvements in China's economic structure and growth quality.

[2] The first-, second- and third-tier cities studied in this paper all belong to 70 large and medium-sized cities in China, which are representative cities suitable for studying real estate market of China, and the city tier classification used in our paper comes from the National Bureau of Statistics of the People's Republic of China.

[3] In housing market, rigid demand refers to the demand coming from the people who have strong desires to purchase houses and are able to pay for that. Generally speaking, these people regard houses as one of the necessities of life and can afford to buy the houses, they are buying houses to ensure their families have stable places to live. From this point of view, purchase for housing investment cannot be included in the rigid demand.