Study on Measuring of Real Estate Speculative Bubble: Evidence from Turkey

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Abstract

The investor's expectation of future price increases on real estate is causing to further rise of prices. In the 1990s, Turkey's real estate price / rental income ratio was around 10, now is between 17-20 years. On the other hand, as a result of insufficient innovation and incentive application of industry, some companies have left their core activity and moved to the consruction industry. Studies using time series analysis with Turkey's data show that GDP growth and interest rates have a great impact on investment decisions of consruction companies. Using Turkstat, Bloomberg and Eurostat data, the empirical part of this study present the relationship between interest rate and GDP growth and consruction investments. The analysis will continue with cross-city-time-series analysis for a sample of 4 well-developed cities of turkey, in terms of construction investments. Finally, measuring the price-to-earnings ratio, the home price-to-rent ratio, the gross rental yield and the house ownership ratio will be compared to those of the metropolitan cities in Europe, whether there is a real estate bubble in Turkey or not.

Keywords: Construction industry, economic growth, recession, home price-rent ratio, real estate bubble.

Introduction

Property bubble refers to an increase in the price of a house that is not associated with such factors as wages, employment, construction costs, land value and interest rates. Real estate bubble can be described as differentiating from basic value by rising prices rapidly, at least for five years, as assets are measured frequantly in modern economies. The holders of assets are positively affected by the increase of prices and an increase in their fortunes occurs. If the wealth is achieved by investing in national savings, the increase in wealth will be healthy. It is generally accepted that most of the past economic crises are triggered by housing bubbles. In this respect, it is important to identify housing bubbles. In the literature, asset bubbles are defined as a sudden rise, which in summary is separated from the expected market prices. The sudden drop in prices after the sudden upsets is eventual bankruptcy and the economy tends to contract. However, there is no consensus on the preliminary design of housing bubbles in the literature. Some advocate that bubbles can be identified in advance, while others suggest that measures can be taken before they become more dangerous, others advocate that bubbles can not be detected, and recommend that measures should be taken to reduce the effects once they explode. However, some indicators and econometric models can be used to determine whether there is a housing bubble.

When housing bubbles burst, the balances in the general economy deteriorate through transmission mechanisms. According to Case and Shillere (2003), the housing bublle increases due to investors' expectations and speculative attacks, rather than the economic fundamentals of housing prices. Allen and Gale (1999) state that housing bubbles occurs generally in 3-stages. In the first stage, credit facilities increase after deregulation. In the second phase, prices decrease rapidly after a while. In the third stage, bankruptcies stemming from credit system are experienced. (Baker, 2007)

 The leading figures of the explanatory indicators are price-income and price-rent ratio. The excessive increase of these ratios may be a signal of bubble. Other signals are the most concrete indicators of the unexpected increase in construction and vacancy rates, excessive decrease in interest rates, disproportionate increase in housing loans, and unrealistic expectations of investors. One or more of these indicators have been experienced in Japan, USA, Spain and Ireland. Econometric methods examine the relationship between housing supply and demand variables. If, for example, the price change of the established model is not high in explanatory power, it may indicate a buble. In a method used by Hui and

Yue (2006) and Jiang et al. (2011), they estimate prices by supply and demand variables, and express the difference between real and estimated prices as estimated housing price bubbles.

Major global housing bubble around the world

The Bank of Japan dropped interest rates in 1987 to 2.5 percent from 5 percent. Japanese banks, which preferably lend more to businesses, began to lend money to financial investors at the time due to the importance of stock markets and global investment opportunity. The government or banks did not have a measure against the case of non-repayment of credits or real estate values. When the bubble burst in late 1990s, economic growth stopped and businesses failure became more widespread.

 Spain's housing bubblle began in 2005 when social media and economists called on the Spaniards to buy assets. Local governments have earned millions by reclassifying land as rural to urban. Politicians and real estate developers have become millionaires of corruption, the real estate continued to grow bubble. However, while home prices continued to rise, salaries did not. As the risk of the Spanish banks increased, the central bank was not able to recover the situation.

At the beginning of the 1980s, there was a need for institutional arrangements aimed at helping citizens benefit from the modernization of the *Australian economy*. Towards the year 2000, low interest rates encouraged greater use of credit channels as a result of increased income. The creation of a private borrowing channel for housing purchases led to prices reaching unsustainable levels. Australia has the world's second highest rate of mortgage debt to GDP at 99%. Before 2009, there were times when the Australian home price index increased more than 10% in a year. There was a call for a bubble explosion of goods and an increase in regulation to prevent the housing crisis

The USA entered a period of great prosperity when it began to move from the wartime economy of the First World War to the economy of the peace period. When the entry of new technologies combined with the increasing entrepreneurial spirit, there is a strong link between the economy and the stock market. But in 1929 America's Great Depression era began in the 1920s. (www.brainyquote.com). In the recession period of 2001, housing prices continued to trend upward and showed a tendency to change, while other elements of the economy, such as the stock market and other interest-bearing investment activities, were stagnating.

There are basicaly two reason to buy the real estate: Buying for the own usage and for the investment motive. Subjective motives plays role in purchasing the house to live in. However, if they are going to sell it in the future, it is aimed to gain from the price differences of buying and selling price.

The value of the property purchased for investment purposes must be carefully examined. The securities valuation methods with small modification in the financial literature can be applied to the real estate valuation. Three valuation principles can be summarized as cost based, income based and market-based approaches. The owner's production expenditures to build the real estate including land price or the replacement cost is a basis for selling price. But often the value attributed to the asset by the cost does not fit very well for the purchasing the real estate. The cost of the seller production or acquisition is often not a good measure, but the final price is determined by the supply and demand in the market.

The second principle is the income approach, cash flow generated real estate in form of rental income. Accordingly, the value of an apartment, shopping center or any real estate is determined by the cash flows (rental incomes) generated in the future." It is also necessary to discount the cash flow in order to calculate the pay back period of and net present value of the initial investment. This method is mainly based on the present value of cash flows that will be generated in the future. In the first step, future income is predicted. In the second step, cash flows are discounted and transfered to the present value finally the difference between discounted cash flows and initial investment gives the net present value of the investment.

The main reason for the discounting the cash flows is that we assume that, money to be received or paid in the future has less value, today, than an equal amount actually received or paid today. The discount rate should also reflect the risks of the investment made. So the fundamental principle here is to adjust the discount rate according to the risk level of real estate and economic condition, the the higher investment risk a higher discount rate should be used.

The last approach is the market-value principle: "The idea behind this principle based on the question; what will be the market price of this real asset when it is sold." The role of real estate appraisers is great for this evaluation. Because they make a systematic appraisal, but they know that the price of other similar real estate for sale in the market should also not

be ignored. Similar apartments close to the value of the real estate to be considered the price by making a near-sale comparison.

Since real estate is also a cash-producing asset, other projects can be eavaluated on the same principle. However, the calculations of the discounted cash flow is not easy enough to be done from the head. That is why a more practical indicator of the real estate market is being used: cash yield. This indicator is based on the question of how many years will it take that the real estate will pay the initial investment (purchase price) through annual net rental income. For example, if the annual rental income of the real estate is $10,000 and the selling price is 180.000 TL, it will pay back in 18 years.

In Turkey, commercial real estate are traded on average at prices equivalent to 15-20 pay back period and homes for 20-25 years. These numbers are lower than developed countries. It is therefore more attractive to invest in emerging country real estate in global comparisons. Of course, these payback periods can vary according to the territory and the neighborhood. The payback period plays a role rather than the price differences. There are various reasons for price differences. However an extremly high payback period may be signal of a bubble in the near future.

Literature Review

During the 2000s, bubbles of house prices were created in many countries. In an article named Hot Air's published in The Economist May 2003, six countries where houses are overvalued were America, England, Australia, Ireland, the Netherlands and Spain. Later, a lot of bubbles in housing prices confirmed this prediction in bubbles exploding in cities.

Himmelberg et al (2005) compared the level of housing prices with the local rental income by measuring the annual cost of single-family housing for the last 25 years of 46 metropolitan areas in the United States. Baker (2007) Using six metropolitan housing market data in three countries, he measurd and compared the bubbles in housing prices. Using an asset pricing model, he identifies bubble periods retrospectively, and also evaluated the ability of various methods to identify bubbles repeatedly in the presence of bubbles. Given the complexity of the asset, the pricing approach he decided that a simple price-to-rent ratio measurement is a reliable method.

Valadez (2010) examined the relationship between home prices and US GDP before, during and after the period 2007, known as the global financial collapse. The housing price index and US GDP tested the degree of significance by analyzing the last five years' data, simultaneously and periodically, with regression analysis. The results indicated that there is a relationship between the two variables, a change in the housing price index of three months, which could lead to a three-month change in real GDP.

Thibodeau (2011), first explains the bubbles of house prices, then uses bubble indices for selected cities in the US for the period of 2000-2010, revealing bubbles in housing prices. The article then investigated some of the literature that tried to identify the bubbles, and then finally investigated the underlying reasons for this house price fluctuations.

As a result of the researches carried out to determine the contribution of the construction sector to emerging economies, have concluded in parallel with studies on industrialized countries that examine the relation between the same variables. The empirical studies examining Turkey's housing market are summarized briefly below. Aydın and others (2007), Hepşen and Kalfa (2009), Kaya et al (2013), Kargı (2013) and Özçelebi (2014), Bolkol (2015), Erol and Unal and Berk and Biçen (2017) examined the relationship between macroeconomic variables and the housing market. These studies investigated the effects of the construction sector on the economy in Turkey and emphasized the contribution in the short term. The majority of the studies found a relationship between the variables, while some studies emphasized that there is a strong relationship and other studies found moderate and weak relationship. Binay and Salman (2008) compared the price-income and price-rent ratios of Turkey with other countries using basically Ankara's data and their findings indicated that the housing bubble was not existed for period of 2000-2005 in Turkey. Coskun (2010) argues that the probability of a financial crisis arising from the housing sector is low because mortgage lending to GDP ratio in Turkey is lower than developed countries. Büyükduman (2012) determined a new housing price index for Istanbul and found that the sales price and rental income are in the vicinity of the long-term average. According to the results of the error correction model, found that only rental income and real interest rates were meaningful in the examined period of 2003-2012 in Turkey, defended that there was no housing bubble. In his empirical and detailed master thesis Karasu (2015) analyzed the recent trend of the housing sector in Turkey. Karasu has stated that the construction industry in Turkey is very active and the prices are going to increase in the near future due to the fact that the construction has increased rapidly and the prices have increased

afterwards and that the sales of houses, the rapid increase in the lending and the increase in prices are not sustainable in the long run.

Methodology and data of the study

Price bubbles are frequent occurrences in property markets. Bubble refers to the fact that an asset has a significant and always incorrect price. A real estate can not be proved to be extremely high in prices unless bubblers burst, but repetitive patterns of real estate excess prices can be observed in the historical dataset. The main indicators for the existence of a bubble are the deterioration of the real economy, as aresult of overcrowding mortgage credit and construction activity, where trends of asset prices are different from income or rent. In this study, it is examined whether there is a long-run relationship between housing prices, current price index, exchange rates and industrial production index variables of Turkey. Monthly data over the period 2010:02 and 2015:12 collected from TUIK, TCMB and Bloomberg and E-views 9 software was used for model analysis. In addition to the Johansen Cointegration test, the Granger causality test is used to define the direction between variables. We used Augmented Dickey Fuller and Phillips Perron Unit root tests for series with the individual intercept and without intercept. Lag length selection based on Schwarz Info Criterion with a max lag of 11. The study was continued with the co-integration test to determine the most stable linear combination of the considered time series. Johansen's Co-integration Test (1988) has been used for the exploration of stable long term relationships between variables. Unit root tests results as first step for this test shows us that all our variables are stationary at the first difference. Then we determine lag interval as 1 with VAR model. (appendix 1). We used the Granger causality test for analyzing the direction of causation between variables. Ho hypothesis; a->b (a is not Granger cause of b) The null hypothesis of no causality is rejected if the F statistics exceed critical values 2.8 at 5% significance level.

Granger Causality test results shows us that exchange rates and industry production index causes housing unit prices; housing unit prices and current prices index causes exchange rates and exchange rates causes current prices index. We can summarized that there is bidirectional relationship between current prices index and exchange rates variables and between exchange rates and housing unit prices variables.

The real estate bubble exist currently in some region of Turkey particularly in the main centers of interest like Maltepe, Kadıköy, Sarıyer, and, Zeytinburnu, where urban transformation has continued in Istanbul. Rent and house price increases are not sustainable in these regions, real estate appraisal experts also approve of this development. In fact, the interest rates are fairly low compared to the earlier years, but the real estate prices are very high, We believe that the low interest rate in Turkey will end in the near future, since the CBRT will adjust the interet rate to the new risk profile of turkey with global pressures.

This study measured the degrees of real estate bubble in four big citie of Turkey by index analysis for the period 0f 2001 to 2016. Briefly, we do not expect a real estate bubble burst in big cities of Turkey, however these exorbitant prices are not sustainable in some places.

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