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Identifying factors impacting property values

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Bucharest 2014

Abstract

The main purpose of this study is to measure the relationship between macroeconomic variables and the housing price. This paper examines empirically whether the increasing trend in the Germany and Spain housing price is related to changes in the gross domestic product, interest rate, inflation rate, benchmarked labor cost, dwellings and residential buildings permits issued for construction and total credit to households. The empirical data were collected from OECD, EUROSTAT, ECONSTAT, DATASTREAM and FEDERAL RESERVE BANK OF ST. LOUIS from 1981 to 2009 for Germany and 1992 to 2009 for Spain. The paper provides empirical results that dwellings and residential buildings permits issued for construction and total credit to households are the key determinants of housing prices.

Keywords: *housing price, economic variable, GDP, inflation rate, interest rate, benchmarked labor cost, dwellings and residential buildings permits issued for construction, total credit to households, Germany, Spain*

Introduction

The real estate market is important for each country not only because it provides building structures and infrastructure necessary for life and work but also because it has a strong impact on the development of the whole nation and multiple economic. The evolution of the real estate market strongly influence the entire economy especially in recent years with the financial crisis.

Prior to 2007, the real estate market was characterized mainly by a dominance of demand over supply, a quick sale of the property and the lack of choice on the part of buyers, which led to an increase in real estate prices.

Since the financial crisis, many property markets are corrected. The largest price decrease occurred in Ireland where he also was the most pronounced increase. Drops in prices were in countries like Spain and Greece, whose prices skyrocketed before the crisis.

The exception to the general picture of overvalued markets is Germany, where the core values remain at historic lows despite price increases in recent years. This makes Germany to be seen by investors as a safe economic haven in Europe.

The real estate market in Germany. Since 1970, Germany has seen four periods characterized by a sharp increase in housing prices. The first phase of rising prices, at the beginning of 1970, the German economy did not suffer serious consequences, remained at a stable level and a full employment of labor. The second phase of the real estate boom was in the late 1970s, specifically between 1976 and 1981, which coincided with the oil crisis, during which inflation rose by 25% for the entire period, meaning somewhere in the 5% annually. This inevitably led to a price increase of

14% in cumulative throughout the phase, about 3% annually. In subsequent years after German unification were made massive investments in residential real estate in Germany due to attractive payback conditions, which led to the third estate boom between 1989 and 1994. The last real estate boom began with the onset of the global economic crisis in 2008, when prices rise began with the European sovereign debt crisis.

Factors that have led to price stability in Germany. If we relate to income Germany is seen, paradoxically, one of the cheapest and stable real estate markets in the world simply because more than half of the population lives rent. Thus, comparing Germany with other countries, it is noted as only 42% of German households are owned by the owners as opposed to a rate almost double, about 80% in countries such as Ireland, Spain and Greece. As a result, the share of rental housing in the total housing in Germany is well above 50%, while in most European countries this rate has decreased in recent years.

In addition to the determinants of real estate price developments in Germany - modest income growth per capita, relatively high interest rate mortgages, negative population growth between 2003-2008 and a surplus of homes available compared to the demand for the right their property - there were a number of institutional factors that had an impact on prices as access to finance and the provisions of the tax system discouraged real estate speculation.

German tax system favors long-term investment in real estate, so that the proceeds from the resale of non-commercialism of a property that was owned by the owner for a period longer than 10 years is exempt from tax. However, revenue from resale of property held for the first 10 years is

subject to progressive taxation of income with a maximum tax rate of 42%.

The real estate market in Spain. Between 1997 and 2007, there was a long period of expansion of housing in Spain. This cycle is different from others because of the volume of construction extraordinary and exceptional duration (eleven years). During this period, the average annual growth in the construction industry was more than 5%. At the end of 2007, almost 14% of the total number of employees were working in the construction sector, the sector with a share of 16% of GDP.

Housing demand has been stimulated by several factors. The most important are strong economic expansion seen in this period, low interest rate on housing loans after the Euro, demographic trends that significantly affect Spanish property market, the flow of immigrants (about 4.5 million 1997-2007) and high housing demand from high-income residents as second homes has led to a boom in the local housing market, with house prices reaching to grow on average 60% decrease in the average size of a house - explained by increasing parent families with one person - which results in the increase in housing directly proportional to population growth.

By the end of 2007, prices began to decline slightly and sales decreased very strong. Adjustments were made through quantities rather than prices. For Spain, the reduction in prices from peak levels was done progressively, following the first signs of significant adjustment. This fall in prices is justified by declining employment, increased cost of capital, increase the housing and the presence of significant levels of credit rationed. Despite steady price declines, housing sales decline between 2007 and 2010 was more than 43%.

Literature review

An international approach was used by Case, Goetzmann and Rouwenhorst (1999), these considering that cycles of real estate markets are defined by major fluctuations of economic variables that are correlated across countries. Their study showed a relevant aspect, showing how GDP seems to be the factor that most affects the correlation between countries. The study also shows how the housing market is visibly affected by a mix of global and local economic factors.

Jin and Zeng (2003) developed a general equilibrium model that examines the relationship between the business cycle and residential investment and house prices. The study concludes that the monetary policy interest rate and the tax rate affects the price of real estate, but the price is strongly correlated with GDP.

Bardhan, Edelstein and Leung (2004) examines the influence of globalization and openness to rental housing market in the country. This paper takes into account 46 of the largest cities of the world and concludes that greater openness rental price increases rents and thus could be used as a price increase on the housing market. The variables used in their analysis are urban wages, the price of services, GDP, GDP per capita, population of the city, opening to the rental rate. The estimation results confirm the assumption that GDP and openness positively affects price; besides higher gross wages, high prices and large population of city services lead to higher rents and therefore higher prices.

In their paper, Meidani, Zabihi and Ashena (2011) studies the relationship existing housing prices, GDP, consumer price index (CPI) and exchange rate as the main variables in a model of endogenous. Test results have shown a significant

relationship between the price of property and economic variables - notably GDP and CPI. It was also observed that the unexpected changes that occur in the price of property does not affect macroeconomic variables but the reverse situation can have a significant impact in real estate.

Case study

In this study I set out to determine the relationship between macroeconomic variables - GDP, interest rate, inflation, benchmarked labor costs in construction, the number of permits issued for housing and the total credit to households - and property value. Thus, the volume of GDP is represented by an index base year 2005, the interest rate is the rate on government bonds with a maturity of 10 years, inflation is measured by the percentage change from the previous period CPI (CPI), benchmarked labor costs is measured in national units and the total credit to households in billion.

Data on the development variables were collected from sites OECD, EUROSTAT, ECONSTAT, Datastream and Federal Reserve Bank of ST. LOUIS.

The equation of the regression model can be constructed as follows:

$$HP = \alpha + \beta_1 * \beta_2 * GDP + CPI + \beta_3 * INTR + \beta_4 + \beta_5 * LCOST * DWE + \beta_6 * CREDIT + \varepsilon$$

Where α - constant term, β - coefficient macroeconomic variable; GDP - Gross Domestic Product; CPI - consumer price index; INTR - the interest rate on government bonds with a maturity of 10 years; LCOST - benchmarked labor costs in construction; DWE - the number of permits issued for housing; CREDIT - total credit to households for housing; ε - the error.

As shown, the time series doesn't have the same measure and should therefore be engineered to avoid comparing different units. For this, after an analysis of econometrics, I noticed that the best method in this case would be standardization of macroeconomic variables so that no longer poses a particular unit, but to refer to a whole; any change to any variable will be measured throughout the study in "unity". Standardization means applying the following formula on each data set: $VXI = (xi - E(x)) / \sigma x$, where VXi is the value of the new data set, xi represents a set value of the data $E(x)$ is the average of the values in the data set, and σx is the dispersion of the values in the data set.

The analysis that I made on Germany and Spain have highlighted the variables which at first did not seem to have as big an impact on property value. Population growth in the analyzed countries determined the need for housing whether owned or leased property. Thus, to meet this need we have observed that the number of permits issued for housing has greatly increased in both countries is one of the most important factors in determining the price. In my opinion I think that this is the factor that determined the difference between the two countries, the difference between how the evolution of real estate prices on the German and the Spanish property market. Increasing the number of dwellings has been viewed differently by the two countries.

In Germany, after analyzing I noticed that most of the population lives with rent, the state provides large subsidies to increase the number of housing such as rental price is reduced, investments in real estate are causing cost growth and a decrease in pressure tenants owning their own. With the increasing number of homes have also increased the costs assessed in the construction workforce.

Mortgage rates have been declining over the period analyzed prompting an increase in the total credit to households for housing and, after a time, an increase in property prices.

Unlike Germany, in Spain, where most homes are personal property, increasing the number of permits issued for housing led inevitably to high demand from both the residents to own their own home and the residents to have second homes. All these have increased the total credit to households for house purchase which in time led to an increase in interest rates and property prices respectively.

Conclusions

In this study, 116 observations were collected for Germany and 76 observation for Spain from websites like OECD, EUROSTAT, ECONSTAT, Datastream and Federal Reserve Bank of ST. LOUIS. All macroeconomic variables used are quarterly for the period 1981 - 2009 in Germany and 1992 - 2009 in Spain. The study was conducted in order to verify whether there is a link between the macro variables and property values in the property market German and Spanish. It turned so that only two macroeconomic variables (the number of permits issued for housing and the amount of credit granted for housing) are positive and significantly correlated with the price of housing for both countries. The result is not surprising given the independent evolution of macroeconomic variables analyzed period and other factors such as inflation, interest rate and GDP have not directly affected the price of real estate, but certainly have affected the number of permits and total amount of credit.

Despite this, the price of housing is connected and the number of inhabitants. An increase in population increases the demand for housing and thus increases their prices. Certainly

more demand will entail inevitably, a supply increase will also affect the price of property.

In future studies can be used other factors that have an impact on property values, such as the size of investments in this sector, personal income or household size expenditure for households and even the fees related to real estate. These variables were not included in the study because we tackled impact from another perspective, the building sector has the largest share. It is also hoped that future work to pursue real estate price fluctuation and variables mentioned perspective to determine another set of variables that influence the value of real estate.

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