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ORIGINAL ARTICLE

U.S. HOUSING SALES: AN ECONOMETRIC EVALUATION

Roopshikha and Esther Ngaihte

Assistant Professor , Delhi college of Arts and Commerce , University of Delhi

Abstract:

The US housing sector has been at the core of the financial crisis in recent times. It began due to the presence of a housing bubble from 2005-06. The inability to finance aggressive mortgages taken at the height of the bubble meant an increase in foreclosures. This paper tries to model the major determinants of housing sales through econometric model, to see which variables are significant in explaining it. We try to give a (ex-post) forecast of what is to come in the next year. We compare it with the actual values to check the accuracy of our model.

KEYWORDS:

Econometric Evaluation , econometric model , Housing wealth , Review Of Literature .

INTRODUCTION

Housing wealth has soared in the United States from 2000-2005. After tracking real income growth closely for at least the previous 30 years, house price appreciation catapulted ahead of income growth. Apart from a brief period during the dotcom bubble, home equity has long been the largest single component of household net worth and commanded a record share by 2005. Moreover, because stock wealth is more concentrated than housing wealth, home equity is vital to more Americans. This boom in housing markets was credited with fuelling consumer spending by making homeowners feel wealthier and inclined to spend more freely and borrow more liberally. These favorable conditions for wealth effects of housing to fuel consumer spending had ended abruptly by 2007.

The US housing sector has been at the core of the financial crisis in recent times. It began due to the presence of a housing bubble from 2005-06. The inability to finance aggressive mortgages taken at the height of the bubble, meant an increase in foreclosures. This refers to the extraction of an individual's house by the government to help finance the unpaid mortgages. Decline in the ability to own houses and the fall in the value of current housing has meant a rapid decline in housing sales particularly in certain parts of the U.S.The fallout has been the collapse of major mortgage giants such as Fannie Mae and Freddie Mac.

REVIEW OF LITERATURE

In the paper, Forecasting Connecticut Home Sales in a BVAR Framework Using Coincident and Leading Indexes by Pami Dua and Stephen M Miller (1996), the authors conclude that regional variables adequately forecast regional home sales. In other words the housing market in Connecticut appears to be insulated from events in the rest of the country. As it happens the coincident index produces better forecasts than the unemployment rate and the leading index produces a better forecast than the housing permits. The BVAR model produces better degrees of freedom and forecasts with smaller samples as compared to the VAR model. As it turns out the use of coincident indices provides superior forecasts and also economizes on

degrees of freedom. This happens as the coincident index offers more information than any individual variable. The authors also discover that introducing home buying attitudes does not improve the forecast performance.

The Great Turn of the century Housing Boom by Jonas D.M Fisher and Saad Qayyum- Federal Reserve Bank of Chicago (2007). In this paper they say that loose monetary policy has not been that significant in influencing home sales. This does not mean that monetary policy has not been that monetary policy has not been loose during this period, just that it has not been significant in influencing home sales. They say that the large levels of spending on housing has been due to the technological progress during the previous decade. They believe that demographic and education changes have not been significant in influencing home ownership. So they believe that there has been a temporary shift to homeownership rates that are historically high.

OBJECTIVE OF THE STUDY

1. To understand variables that are significant in explaining the US housing sales
2. To test the accuracy of the model by forecasting the future values of US housing sales

DATA

We take monthly time series data of the U.S. Housing sales from January 1998 to December 2007 to conduct our exercise. The estimation period has been taken from January 1998 to December 2006 and then out of sample forecasts are made from January 2007 to December 2007.

RESEARCH METHODOLOGY

The estimation technique we used is Ordinary Least Squares (OLS) regression. The equation used is as follows:-

Housing Sales = a1 + a2 PDY (personal disposable income) + a3 CPI housing + a4 mortgage rate + a5 unemployment rate + a6 permits + e1

The Independent Variable (Y)

The dependent variable in the above model is the housing sales on a quarterly basis for the above mentioned period. The choice of the dependent variable is due to the fact that the velocity of home sales in the above mentioned period also reached new levels, unlocking additional stores of home equity and converting it to cash in the pockets of consumers and thus adding to the housing bubble.

The Explanatory Variables (X)

The independent variables are selected so as to explain the variations in housing and also to reflect on various factors responsible for the housing bubble.

Personal disposable income (PDY)

The first dependent variable is the household income. All else being equal, the richer households are, the more housing they demand. Housing's link to consumption occurs largely through changes in wealth driven by home prices. In general, higher asset prices encourage spending by increasing the lifetime resources of income and wealth households can consume. Of the types of household wealth subject to large price movements, the most important are stock investments and housing. Federal Reserve's flow of funds data provide a useful prism through which the recent years' trends in wealth can be viewed. Some measure of financial assets of households can also be included in the model to see weather housing is also used as a hedge against risk in the financial markets and is also used for speculative motive as there various reasons due to which housing can be considered as a better asset than stocks and bonds.

Housing prices (CPIHOUSING)

Another major factor affecting home building that we consider is housing prices. Since housing is a normal good as demand for housing increases, housing prices rise. Also as incomes increase, we expect

Prob
0.0629
0.5646
0.6636
0.0009
0.0999
0.0000
991.9333
164.1225
10.71238
10.85175
233.1849
0.000000

that more housing will be demanded, which in turn increases the average price of housing. Price of a house will be an important determinant of housing sales. In the model we use a price index of housing.

Mortgage rates (INTRATE)

Mortgage rates affect the sale of homes in a variety of ways. On the most basic level, lower mortgage rates increase the amount of home a person can buy for the same monthly payment. With lower interest rates, the prospective home buyer can purchase a more expensive home. However it can be that in case of low mortgage loans, and homes are selling quickly, the price of homes may creep up, effectively canceling out the benefit of the lower mortgage rate. As the price of homes increase, there may be less competition among buyers, and, interest rates may drop. In the model we will be taking both the nominal rate and real rate, which is equal to the nominal rate less an estimate of the expected rate of inflation, to assess the affect of inflationary expectations.

Unemployment (UNEPRATE)

Higher rates of unemployment can lead to low demand for housing. This will essential be an indicator of lower economic well being. So the higher unemployment rate can dampen the demand for real estate.

Housing permits (PERMITS1)

This variable denotes the number of housing permits given out for the construction of houses. Thus the larger the number of permits given out the larger will be the number of houses constructed. Hence we can say that housing permits could be an important explainer of housing sales as it may act as an indicator of greater housing sales. So when housing permits take an upward spike, so must the the number of houses sold.

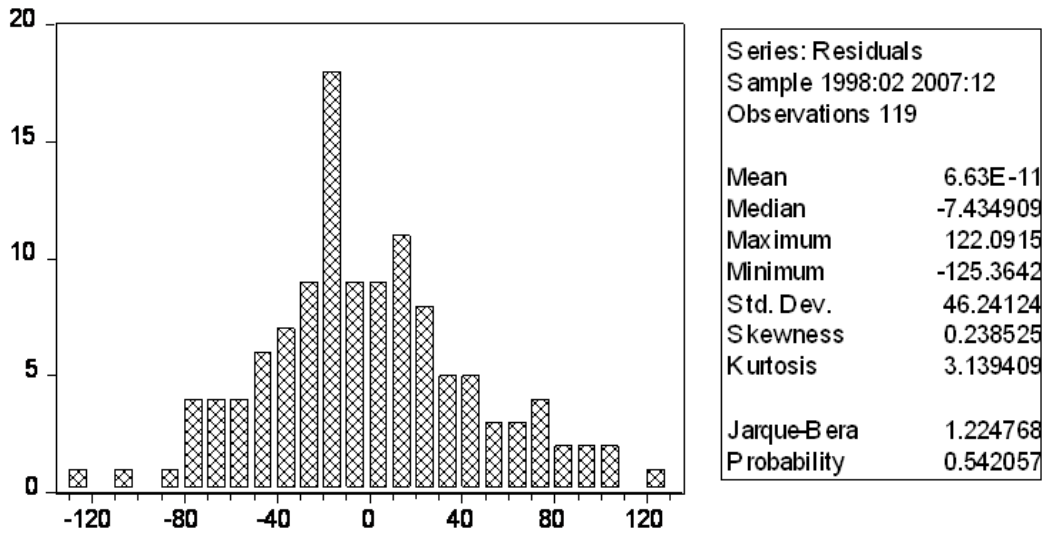
TESTING FOR REGRESSION EQUATION

Regression table generated by Eviews is as follows:-

When we tested for heteroskedasticity, we didn't find any evidence against the null. However, the test for serial correlation indicated positive serial correlation. There is serial correlation in the series considered.

Correcting for the Serial Correlation by incorporating AR(1) gave us the following:

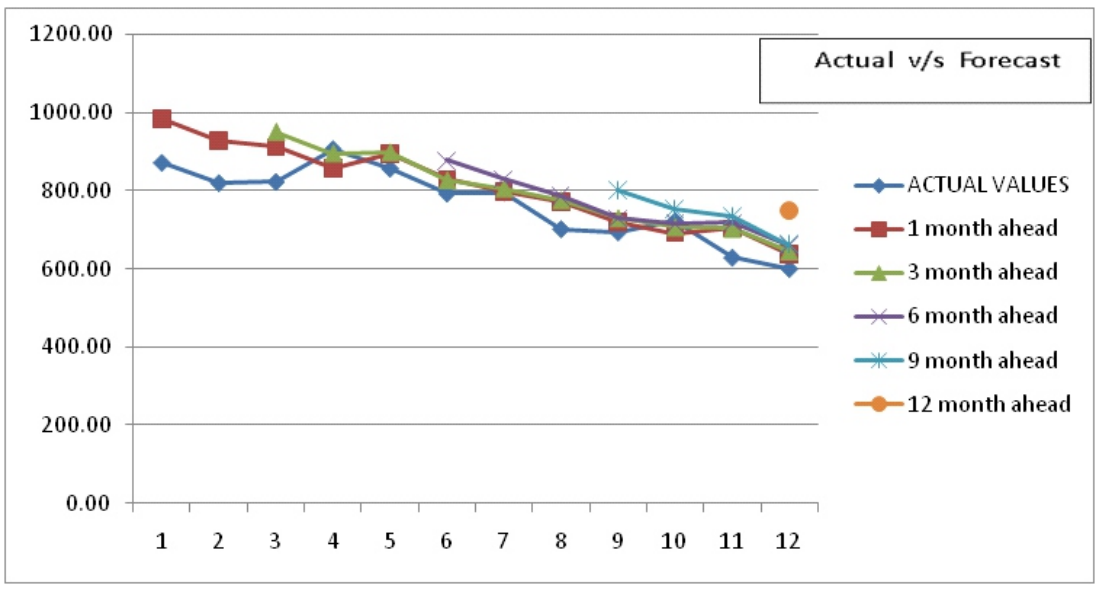
TESTING FOR NORMALITY OF ERRORS



What is important here is the Jarque Bera test. That is the statistic we consider in determining whether we are near normality. As we get a high p value, we accept the null hypothesis of normality. So the residuals are normally distributed as is desired.

FORECASTING

An economic model which matches the reality is a good model. Next we try to compare the trend in actual US housing sales and what our model predicts. The estimation period has been taken from January 1998 to December 2006 and then out of sample forecasts are made from January 2007 to December 2007. We evaluate forecasts for five horizons: 1 month ahead, 3 months ahead, 6 months ahead, 9 month ahead and 12 months ahead. A comparison of actual and forecasted values are given below. It shows that our model fairly predicts its trend.



CONCLUSION

The results show that the economic theory can be applied in the real world since movements in housing prices, mortgage rate, personal disposable income, housing permits and unemployment rate do

affect housing sales. We were able to obtain good forecast for our dependent variable using the OLS technique.

POLICY IMPLICATIONS:

To boost real estate sector, government should reduce interest rates. It will decrease the cost of borrowing which enhance the demand of housing because mortgage interest rate shows negative relation with housing sales. Government should focus on economic growth. Increase in GDP will increase disposal income of people which in turn will increase the housing sales, disposal income has positive relation. Unemployment should bring under control, it good for whole economy. Government should provide flexible rules for housing projects, speed up in clearing the pending projects, less requirements of paper work and friendly environment to investors. It will boost the investors, domestic and foreign, confidence and provide atmosphere for further investments in real estate.

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Assistant Professor , Delhi college of Arts and Commerce , University of Delhi

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