The Housing Bubble

Shelby Brown

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Project Advisor: Stan McCaa

Abstract

The housing market is constantly changing. Fluctuating housing prices and a flooded market have home buyers hesitant to commit and sellers on edge. What if the prospective buyer or seller could take this financial step already knowing the state of the market? The purpose of this project is to attempt to predict the next housing bubble. A multivariable regression analysis is conducted using relevant data including variables such as average property prices, number of foreclosures, etc. in the United States beginning in the year 2009. The trends, patterns, and models created from the regression analysis are compared against data models from the housing bubble of 2008. This comparison is used to identify similarities between trends that led to the previous housing bubble. Using the different sets of models, a time-line that predicts the next housing bubble is created.

Keywords: housing bubble, pop of bubble, mortgage, equity, home loan, housing start, flooded market

1 Introduction

Plans post-graduation are constantly changing. I am someone that takes their time making concrete plans and big life choices. It took many tries to find a major I was passionate about and even longer to land on what I wanted to do. While completing this project, I realized I would like to pursue a career in the mortgage industry. Having worked for a mortgage contracting service in the past, I am already acquainted with the different areas I can work in. I will be moving to New Orleans, Louisiana as the housing market is in the process of expanding in the area. While also using my degree on the financial side of the mortgage industry, I am also in the process of pursuing a Louisiana Realtors License. This will allow

me to experience firsthand the other side of the market and allows for a better understanding when working with clients.

The motivation for pursuing this topic not only stems from a personal interest in the subject, but also due to the amount of current data avaliable pertaining to the task at hand. This project will look at some of the major and key variables that influence the state of the housing market within the United States over the last decade.
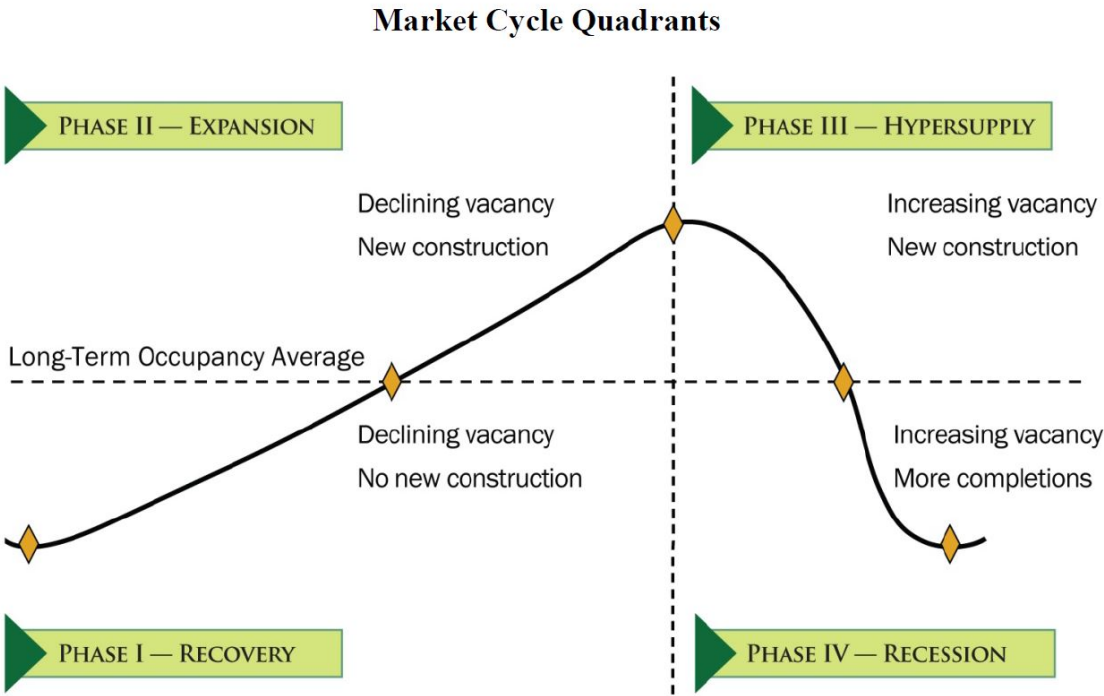
2 Background Literature/Related Studies

The housing market is constantly changing. Everyday homes are being listed and purchased across the United States. When prospective home buyers begin the search for a new home, many "don't ever think that the value of their home might decrease" [6]. This is considered a common occurrence when referring to a real estate housing bubble.

2.1 What is a Housing Bubble?

A housing bubble "is a run-up in housing prices fueled by demand, speculation, and exuberance" [2]. Over the last decade, there has been an increase in the number of Americans looking to sell their home. A housing bubble starts when there is an increase in the buying demand. When there is a limited supply of homes on the market, the average asking price of sellers increases. This number is far greater than the number of Americans that are in the market to purchase a home. Due to the difference in numbers, the housing market then becomes what is referred to as a flooded market. A flooded market contributes to a fluctuation in price which can result in a loss in home equity. Prices then spike and owners may end up owing the bank or loan company more money than the home is worth, which is directly related to the decrease in home value.

Typically, a housing bubble is not identified until it is considered to have 'popped'. A housing bubble is considered to have 'popped' when the number of homes on the market topples over the demand. In order to better visualize a bubble and its pop, the housing market can be referred to in phases, cycles, or quadrants. There are four phases of the market. Each phase serves as a vital and important role for the housing market. The phases are as follows: Phase I-Recovery, Phase II-Expansion, Phase III- Hypersupply, and Phase IV-Recession. These phases provide a better understanding of how new home construction and property vacancies factor into the state of the market. While each variable may seem unimportant, both are considered some of the largest, most important factors. The figure below visually represents each phase.

Market Cycle Quadrants

PHASE II — EXPANSION

Declining vacancy
New construction

Long-Term Occupancy Average

Declining vacancy
No new construction

PHASE I — RECOVERY

PHASE III — HYPERSUPPLY

Increasing vacancy
New construction

Increasing vacancy
More completions

PHASE IV — RECESSION

Source: Mueller, Real Estate Finance, 1995.

2.2   The Housing Bubble of 2008

The last documentation of a housing bubble occurring in the United States was in the year 2008. One of the largest impacts of this market crash was the "rush to lend money to home-buyers without regard for their ability to repay" [10]. As banks and loan companies began to realize the extent of the problem, they began to raise interest rates with the hope that the spike would influence a faster payback. What the loaners did not anticipate, however, was the lack of a response. Increased interest rates only increased the value of the loan, making it even harder to pay back what was originally owed [1]. It is hypothesized that "the Great Recession was not caused by an unexpected event" [5]. Statisticians and mathematicians alike banded together to predict the bubble of 2008, however, none could specifically pinpoint a month for the pop to occur, as it is challenging to identify if a market is in a bubble unless it has already 'popped'. However, interest rates have a direct effect on the real estate market and this helped contribute to the housing bubble. Companies began to compete against one another by altering interest rates, the minimum payment amounts, and frequency of payments.

At this point in time, interest rates on home loans are at an all time high and "history shows that real estate interest rates tend to hit their highest after land values peak" [3]. The housing crisis of 2008 was not identified until after the fact. While the market was already in a fragile state, data scientists worked diligently to uncover the root cause of the problem. Unfortunately, the outcome was bleak, and the market crashed. It is from this

past experience that individuals have dedicated their time, energy, and effort into predicting the next crash before it happens. If able to do so, it would greatly impact the economy of the United States and allow for a more stable market for potential buyers and sellers [9].

2.3   What Can You Do?

A housing bubble affects everyone. There are certain measures or precautions that can be taken to help limit the personal impact. What can you do to soften the blow? Here are a few tips and pointers for preparing for the next housing bubble [7].

One of the best ways to make certain to not default on a mortgage is job security. The better suited into a solid, stable profession the less likely an individual is to default on their home loan. With this in mind, it is wise to not immediately purchase a home just because of said job. It is best to wait until having worked in this same job for a while to ensure not only financial stability, but to also be certain that a relocation will not be happening anytime soon. It would be unfortunate to take out a large loan only to realize that you must sell out, especially during the time of an unstable housing market. Another thing to consider before purchasing a home, ask 'Is it a necessity?'. In the United States, the price-rent ratio is seemingly affordable. If an individual has the option to rent for a shorter period of time (knowing that a permanent residence is not a smart choice at this time), they are less likely to be affected by the state of the housing market. Already being committed to a leasing agreement when housing/rent prices begin to spike ensures that the amount already being paid will not change at that moment. While prices may increase with the next lease, there is time to decide whether to continue renting or begin looking for another housing alternative. In the end, if the goal is only needing a place to rest your head, take the time to save over spend [8].

Which leads into the next way to protect yourself when home-buying during a housing bubble. While it is not recommended to purchase during this time, making sure to pay at least a 20 percent down payment will help reduce the monthly mortgage payment. Allowing the opportunity for a lower payment takes the burden of paying the loan company or bank back down a notch. It is said that the "higher your overall down payment, the less in interest you will pay and the higher your non-home equity net worth, the less likely you are to default on a mortgage" [4]. The average age of the typically homebuyer in the United States is getting lower and lower. It has been questioned that due to the lowering age, buyers are spending more money than necessary in order to purchase homes that are larger than needed. Only purchase what is needed. A larger home comes with larger utility bills, which in turn, takes money away that could be put toward a monthly mortgage payment.

3   Methods

In order to be able to create a time-line for the next housing bubble, a multivariable regression analysis must be used. Multiple regression has only one output variable, but multiple input variables that each contribute to the singular output. To run the data analysis, all used information and data was put into Microsoft Excel. An additional Excel package is needed to successfully generate the regression models.

4   Data and Models

In order to run a multivariable regression analysis, different areas of data were needed. Data such as average property selling/purchase price and number of foreclosures in the United States were needed, as they are vast and influential contributors to the housing market. In addition to foreclosure and purchase price, the number of new construction homes for each year is also crucial. Data, manually input into an Excel spreadsheet, can then be analyzed according to individual variable. This individualized data can then be compared to that of the 2008 housing bubble, where trends can be identified between the two different sets of information.

4.1   Data

The raw data used for generating the models needed for this project included that from the last decade. Data was acquired from multiple different sources including, but not limited to, HUD (Department of Housing and Urban Development), the Census Bureau, multiple public governement agencies, and archived real estate statistics. Each database used has a slightly different approach to collecting their data. While no two are the same, the results are still conclusive. Most data can be obtained easily and is part of an open, public record. This made locating and downloading each data set smooth and simple. The data was able to be downloaded and exported into a Microsoft Excel spreadsheet where it was then organized by variables, time frame (by year or month depending on how individualized the data was), and labeled according to what the data pertained to.

4.2   Models

The following graphic was generated using data recovered from the Census Bureau. As the graph visually depicts, the number of new construction starts over the last decade has gradually increased with each passing year.

Just as important as new construction, the average number of foreclosed homes impacts the state of the housing market. Below, a trend line shows the decline in number of foreclosed properties. As this number decreases, buyers are swayed towards beginning their own new
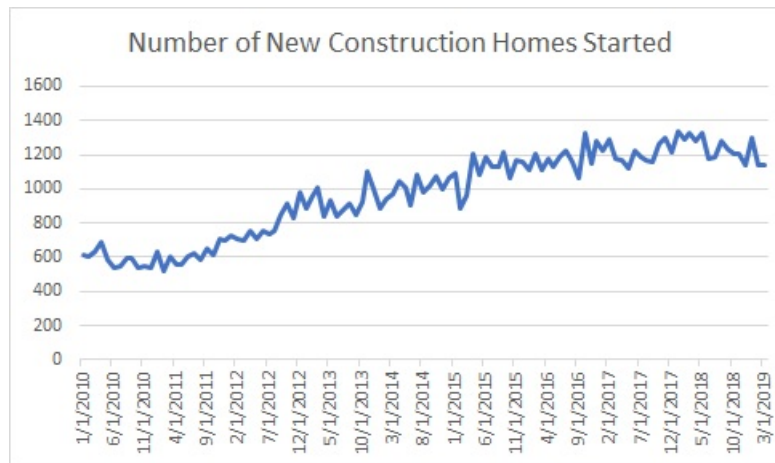
construction or are to look at properties already listed. This, in turn, increases the demand of the market and the average selling price begins to rise.
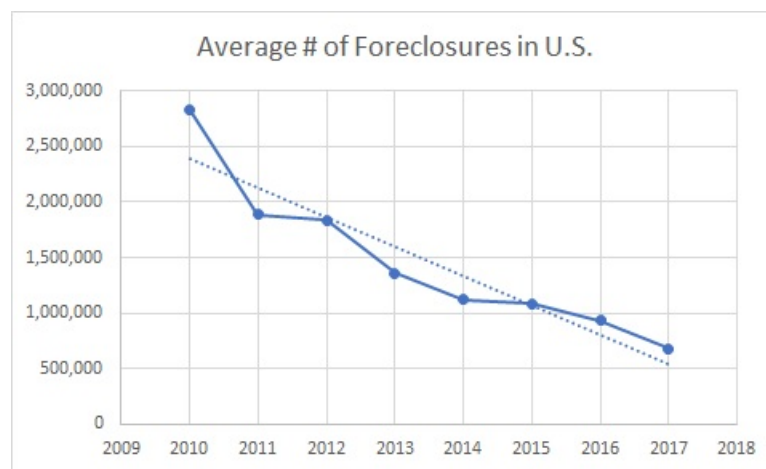

Upon creating a chart for the number of new constructions and number of foreclosures, a visual aid for average selling price was needed. Being able to see the increases, dips, and peaks in the data allows for a more accurate way to compare the generated models against those from the housing bubble of 2008.

5   Results

Upon completeing the multivariable regression analysis, each model generated from the organized, collected data is then compared to models from the 2008 housing market crash. By using this comparision, any and all patterns and trends between each data set can be clearly identified. Based on the results of my own multivariable regression analysis, I was then able to make an educated time-line prediction of the next housing bubble. The regression analysis data is shown in the figure below.

It is with confidence, that my data shows the next housing bubble to occur in the year 2021.

Average Selling Home Selling Price
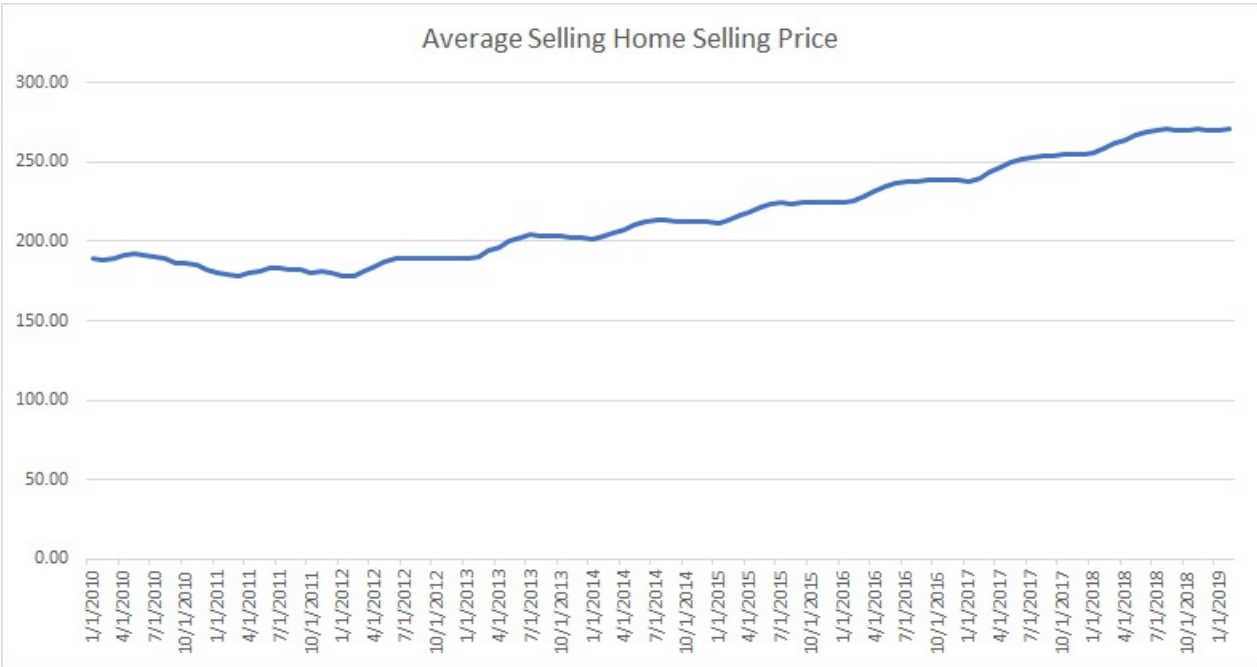
Regression Statistics		Regression Statistics		Regression Statistics	
Multiple R	0.940996	Multiple R	0.962553	Multiple R	0.936477404
R Square	0.885474	R Square	0.926509	R Square	0.876989928
Adjusted R	0.866386	Adjusted R	0.925829	Adjusted R Square	0.875861395

While a specific month has not been pinpointed, the results lead me to believe that it will occur anywhere from April 2021-August 2021. While this may seem like a large margin, these months show the highest peak before a large dip occurs in the market. It is also during these summer months that the most home buying occurs, making this a likely time frame for a housing bubble.

6   Conclusion

Conducting this research has been very rewarding and eyeopening. I have gained a greater insight to the mortgage industry, and it has influenced my future career goals. While many other mathematicians, statisticians, and researchers have set out to also predict the next housing bubble, each has their own unique approach and data set that, in turn, gives a different prediction.

Throughout the course of this research, the support of my faculty advisor, Stan McCaa, played a vital role in staying on task and focused. He was an endless source of knowledge and ideas, always willing to help in any way necessary. The completion of this project would not have been possible without him, and for that I am thankful.

If I were to conduct this research for a second time, I would use more in-depth data and additional variables. The more variables that are introduced into the analysis, the more accurate the prediction. Another change I would be interested in, is pinpointing a specific area. While it is nice to know about the United States as an entirety, being able to know the state of the market for a specific region, state, or city seems more beneficial to prospective buyers and sellers. Looking at the real estate market as a whole entity gives a broad visual of the market. Being able to analyze the different areas can also factor in additional variables that may not be as prominent in other parts of the country. Looking at different poverty levels, average household income, and land value can influence how far a single dollar can go. Overall, the real estate market is easily influenced and highly unstable, and there are many different variables to consider, each having its own impact to the overall state.

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