AN EMPIRICAL STUDY ON HOUSING BUBBLE IN U.S. ECONOMY

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Abstract

AN EMPIRICAL STUDY ON HOUSING BUBBLE IN U.S. ECONOMY

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The thesis focuses to seek the relationship of factors affect to the housing bubble in U.S. in the period from 1982 till 2012. The housing bubble was a start of an economic crisis affected badly to all type of markets in U.S in 2006 and 2008. For examining the relative factors, such as consumer price index, housing inventory, median household income, average income, GDP, owner and renter of houses, population, median asking rents, location, as well as mortgage debt and rental vacancy rates are selected whether they effect significantly or not to medium asking price in the housing market. The quantitative analyses through a t-test and a stepwise regression model are used to find the link of them. The data for research are collected from archives and reports published by U.S government. The research

found that the factors selected effects significantly to the housing market fluctuations.

논문초록

본 학위논문은 1982 년부터 2012 년까지의 기간에 미국의 주택 거품에 영향 준 요인의 관계를 찾기 위해 초점을 맞추었다. 주택 거품은 2000 년과 2008 년에 미국의 모든 종류의 시장에 심각하게 영향을 줬던 경제위기의 시작이었다. 관계된 요인들을 조사하기 위해서 소비자 물가지표, 주택재고, 중간가구소득, 평균소득, 국내 총생산,집 소유자 및 임차인 인구,일반지불 임대료 위치,그리고 모기자 와 임대주택 공가율로 일반적 요구가격이 주택시장에 상당한 영향을 미쳤든 아니든 간에 선택이 되어졌다. T-검사 정량분석을 통한 양적 분석이 주택시장 가격과 연관이 되어져 있는지를 알기 위해서 사용이 되어진다 조사된 데이터가 미국정부에 의해서 발해서 발행된 기록물이나 보고서 양식으로 모여졌다 보고서에서는 수반된 요인들이 주택시장에 상당한 영향을 미치는 것을 보여준다.

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I must express my gratitude to my family members for their continued support and encouragement in writing period of my research. Completing this work would have been all the more difficulties were it not for the support and friendship provided by the members of the Department of Trade and Economics in the university. I am indebted to them for their help.

Chapter 1 Introduction

1 Background and objectives

Housing bubble is among many other bubbles, stock market crashes, economic bubbles and financial crisis that have occurred throughout the history. The first bubble occurred was the tulip Mania in Holland in the seventeenth century, supply market is the fundamental explanation of the three most famous bubbles; the Dutch bubble tulip manias (1634-1637), the Mississippi bubble (1719-1720) and the South Sea bubble (1720). The Dutch tulip mania of the 1630s has long served as the epitome of the financial bubble.[1]

Housing bubble is an economic bubble affecting the housing market in most of American states. The housing prices peaked in 2006 and 2007 then started declining. The subprime mortgage crisis is a set of events and conditions that led to financial crisis, then recession in the market follows; the rise of the mortgage delinquencies and foreclosures resulting to a decline of securities related to mortgages. The Mortgage Backed Securities (MBS) offered attractive rates of return due to higher interest rates on the mortgages[2], so the lower credit quality caused massive defaults, many financial institutions Ire collapsed in September

[1] Garber, Peter, The Famous First Bubble, *American Economic Association*, American, 2000,p.13.
[2] Shiller, Robert, Irrational Exuberance, *Princeton University Press*, New Jersey, 2005,p.301.

2008, with significant disruption in the flow of credit to business and consumers and sever global recession created.

There were many different causes of the crisis among them; the financial institutions, regulators, credit agencies, government housing policies and consumers. The rise of the percentage of mortgages interest rates which was 8% for a long period of time to reach 20% from 2006-2007 with much higher ratio in some parts of US , such unstable rise in the interest rates ratio in mortgages has lowered lending standards and higher risk mortgage products.

The period of 1940 up to 2010 witnessed a continuous rise in the average prices of housing in US; such rising creates a great assets bubble in the economic history of mankind. The period that followed 2000 up to 2010 has witnessed a rise and fall in the housing market and a great decline in the second part of 2006. Such unstable status of housing market affected the macro economy of US, and considered to be among the important reasons for the housing and mortgage crisis in US. The study aims to know the reasons beside the housing bubble and the effect of that bubble on the economical status. Knowing the causes will help the decision makers to avoid any coming housing bubble or market crash which will affect the financial institutions.

Throughout this study in similar researches, such as Wall Street and the housing bubble in 2004-2006, issued in 2013, and the subprime mortgage crisis in 2008 in US, I found that most of the studies tackle a specific subject in a specific place in the world, trying to find out the problem, and analysis it, and to find the solution for that problem, which is suitable for area of study. The US market is the biggest market, so it is a very important and interesting to study the housing problem in such an important area, and try to get use of the results in different places in the world, putting into consideration the differences between the areas, cultures and economical status. And the problem of the thesis can be restricted the following main question: How did the housing bubble affect the economical status especially

in United States as the biggest one in the world in the study period?

The study is supposed to answer the following questions:

1. Dos the mortgage crisis continues in the US, and what are the effects of such crisis on the economical status?
2. What are the ways to fix the mortgage crisis in America, and how can others benefit from the supposed reform.
3. What is exactly the cause of the housing bubble in US, and what effects does it leave in American economy?

2 Methodology of the study

The source of research data were; previous studies, statistical reports, articles, government and financial institutions reports and any other related literature. The study will follow the quantitative approach in analytical and descriptive manner depending on the collected data and reviewing the related previous studies. And the thesis will use SPSS to analysis the data stepwise method which content ANOVA and model summary and coefficient table which can decide from it the result of variable from analysis model.

3 Research Scope

Time Scope

The study is divided to two periods from 1982-1997 and 1998-2012 and using by available data which content from independent and dependent variables from U.S census bureau to compare its. Also analysis all the data from 1982-2012 in one time and use it by models, and this period is very important because the housing market is changed from continuous price rising to rise and fall, and witness's collapse of many financial institutions.

Place Scope

The housing market in the United States was the biggest bubble in the world in the human history. And the research content data depend the place such as the Median asking price and Median Asking Rent in (North, Midwest, South, west) and analysis it to get accurate result.

4 The structure of the study

This thesis consists of six chapters each of them tackles a specific topic, these chapters are as follow:

Chapter one consists of the study proposal which consists of the problem of the study.

Chapter two consists of theoretical framework and related previous studies.

Chapter three will tackle the causes of housing bubble and the mortgages crisis and the effect of them on the American macro economy.

Chapter four consists of the research model and hypotheses, in this chapter the study will test the Hypotheses and analyze it using the research existing models.

Chapter five tackles the results of research analysis and the hypotheses test; connecting it with the influence of housing bubbles on the American economy and its effect on the housing market.

Chapter six will deal with the study findings and implications.

Chapter 2 Theoretical Framework and Literature Review

1 Theoretical framework

In this section will explain the definition of housing bubble and define it with lot perspectives. And will be identify the rational growing bubble theory and the Greater Fool Theory which presents the way how to expect when the investors cause the bubble and how the price can effect in the market and reach to the boom situation.

1.1 The definition of housing bubble

The housing bubble as Shiller defined the bubble in his report as the national or publicly way. He said that the notion of bubble is really defined in the terms the people's thinking: their expectations about future price increase, their theories about the risk of falling price, and their worries about being price out the housing market in the future if they do not buy. Economic rarely ask people what they are thinking when they are make economic decision[3],So, if the expectations high, home sellers will have stay their investments and think to sell the house in another period to more margins because that the expectation will increase the demand in this situation the bubble is start. The trader behaviors fallow the interest rate and their expectations about suit prices when they make any investments. Also, Arnold L. G. commented in this mutter as 'the asset price must exceed the expected pay off in order to compensate rational traders for taking the risky short position. In the absence of rational traders, by contrast, price equals expected value.[4]

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[3] Shiller, R.,"Is There Housing Bubble in The Housing Market", *Brooking Papers on Economic Activity*, 2004, vol.2, p.14.

[4] Lutz, G.,"The Economics of Rational Speculation in The Presence of Positive Feedback Trading", *The Journal of Finance*, 1999, vol.45, p.1.

In other hand, Kindleberger, in his economic dictionary book, defined the bubble "A bubble maybe defined loosely as a sharp rise in price of an asset or a range of assets in a continuous process, with the initial rise generating expectations of further rises and attracting new buyers generally speculators interested in profits from trading the asset rather than its use or earning capacity. This rise is usually followed by a reversal of expectations and a sharp decline in price often resulting in financial crisis. They are characterized by price increases greater than justified by market fundamentals. Rational expectations theory holds that prices are formed within the limits of available information by market participants using standard economic models appropriate to the circumstances.[5]

Because that, the traders are looking for good profit and in booming situation. Even there are several types of cause of the boom but there is no standard reason as why the housing price is unexplainable. Garber commented about this matter the standard of reference force in economics typically refers on more of these events defining the term of bubble. The defining a housing bubble as the part of the house price movement is unexplainable by fundamentals, on other hand, defining the bubble as "any unsound commercial undertaking" accompanied by a high degree speculation[6] ,So, there is many directions and factor to define the bubble. These factors make rational bubble concepts. Next section will talk about the rational bubble and theories.

1.2 Rational bubble

The researchers define the bubble written in this chapter in various types. According to Garber and Beter, the housing bubble is one part of the house price movement that is unexplainable by fundamentals. It means that if we want to know how the bubble occurs, it is impossible. If it is possible, we must know about the

[5] www.investopedia.com.
[6] Garber, Peter, The Famous First Bubble, *American Economic Association,* American, 2000.p.30.

rational trade. And it's explained in this section by defining the "rational behavior". The definition of "Rational Behavior" is based on making choices that result in the most optimal level of benefit or utility for the individual. Most conventional economic theories are created and used under the assumption that all individuals taking part in an action or an activity are behaving rationally[7].According to the Byre activity value in housing price or asset, it may follow to the boom price. Shiller said the cause of the booms are still until now is not understood and fully the rational trade, price driven fundamental such as income demographic investor information and national economic condition make source in most countries[8]. In the next section will be explain bubble theories and present about the rational growing bubble theory too.

1.3 Rational growing bubble: theory

The rational price must be equal to an ' intrinsic value', the discounted dividend stream, and a bubble term (which can be zero, of course). Growing bubbles are consistent with rational expectations, and hence with the hypothesis that markets are informational efficient, because current prices reflect the discounted price of the future bubble. Traders cannot make excess profits by knowing prices will be too high next period, because the price is too high in this period, also. Indeed, because expected profit from the bubble is zero, there is a risk in neutral trade[9].

In the addition, Tirole J. has tested the possibility of bubbles in an overlapping generation model. In such model, the agents are born on different dates and have a finite lifetime. It means that assets are traded through new generations and the economy goes on forever. Tyrol also states that in same model which there is an infinite number of finite living traders, a bubble cannot rise when the interest rate

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[7] www.investopedia.com.

[8] Shiller, R.,"The Behavior of Home Buyers in Boom and bost-Boom Market", *National Bureau of Economic Research Working*,2008, No.2748, p.14.

[9] Camerer, C.,"Bubble and Fad in Asset Price", *Journal of Economic surveys*, vol.3, 1999, p.6.

exceeds the growth rate of the economy. The reason is that an asset must grow at the interest rate. When an asset price grows faster than the wealth of the economy, the new generation is not able to buy it and the old generation is not able to sell it. For this reason, a bubble cannot occur.[10]

Kocherlakota also introduced rational bubbles on assets by this method. He argued that bubbles may exist if "the marginal utility of wealth does not decline to zero as wealth goes to infinity". The relationship between bubbles and output, or capital stock, depends on the property of the production function. For a production function with decreasing returns to scale, this relationship is negative. On the other hand, it might be positive for a production function with increasing returns to scale. However, all of these analyses are under the restrictive assumption of linear utility in consumption.[11] And the relation between monetary policy and asset price bubbles illustrated by the simple example in the present section is at odds with the conventional wisdom, which invariably points to an interest rate hike as the natural way to disinflation a growing bubble. One might argue that the partial equilibrium nature of the previous example may be misleading in that regard, by not taking into account the existence of aggregate constraints that may impose limits on the size of the bubble and hence on its survival. Furthermore, the type of policy intervention considered (i.e. an exogenous change in the real rate) is arguably less relevant than a policy rule determining the systematic response of the nominal interest rate to movements in the size of the bubble[12].

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[10] Tirole, J., "Asset Bubbles and Overlapping Generation", *Econometrica*, vol.53, 1985, pp.1500-1503.
[11] Ge, Z.," Rational bubbles and the spirit of Capitalism", *Munich personal Repec*, *Archive*,2008 No.44719, p.7.
[12] Gali, J. ,"Monetary Policy and Rational Asset Price Bubbles, *Center for Economic Policy Research*, vol.2, 2013, p.30.

1.4 The Greater Fool Theory

In last section is showed from assess the rationality of bubbles theory the market condition when the bubble can and cannot occur. According to the greater fool theory described by Douglas, investors are aware of the fundamental value of an asset. Observation that any price can be justified if a buyer believes that there is another buyer who will pay an even-higher price for the same item. This line of thinking causes and fuels stock market and commodity market booms and manias which, in due course, lead to busts and paranoiacs[13].

On other hand, Shiller states that fool comes from buyers' stories to increase of interest rate. He continues that the current boom differs from prior booms in that it's much more of national, rather than regional, event in the current boom, successive rounds of regional home price boom have occurred that eventually become that can be called national boom the housing boom might be such a story and not something more tangible like the policies of the central bank has never taken hold in public consciousness. People like to change stories of crazy investors. These factors affect to raise the price and increase the interest rate.[14]And Keynes J. M. discussed about speculation and bubbles, and pointed to five factors which foster these episodes:

(1) Beginner investors own an increased proportion of capital investment;

(2) The day-to-day price fluctuations have an excessive influence over the market;

(3) Violent changes in the mass psychology of ignorant individuals' changes asset valuations;

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[13] www.investopedia.com.

[14] Shiller, Robert, Understanding Recent Trends House Price and Home Ownership, *Cowles. Foundation*, 2005, pp.95-97.

(4) Professional investors devote their skills to “anticipating what average opinion expects the average opinion to be;

(5) There is a confidence or lack in the credit markets.[15]

2 Literature review on previous studies

The literature review aims to discuss the different definitions across the literature over the past twenty years; the firstly, in this part of paper topic on bubble is given series of thoughts on the definition, nature and consequences of asset price, The study touches on two strands of literature, i.e. the literature that analyses the determinants of the bubble causes, and secondly, the one that links mortgages crisis in macroeconomic developments and economic policies. Shiller, R. J. (2005) he show how the bubble relationship between the buyer expectations of large future price increases are sustaining the market, whether these expectations are salient enough to generate anxieties among potential homebuyers, and whether there is sufficient confidence in such expectations to motivate action. And he said if the expectations of rapid and steady future price increases are important motivating factors for buyers, then home prices are inherently unstable. Prices cannot go up rapidly forever, and when people perceive that prices have stopped going up, this support for their acceptance of high home prices could break down. Prices could then fall as a result of diminished demand: the bubble bursts.[16] In the addition (2007) defines that the real estate bubble may soon burst, and he supports his claim by showing that median home prices are now six to nine times greater than median income in some areas of the country.

My theses is related to theoretical literature showing the rational growing bubble theory of Tirole, J. (1985) on asset bubbles and overlapping generations and the bubbles show haw start be with productive saving and cannot grow faster than the

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[15] Keynes, James, The General Theory of Employment, *Macmillan Cambridge University,1936,pp.50.*.

[16] Shiller, Robert, Irrational Exuberance, *Princeton University Press*, New Jersey, 2005,p.301

economy, their existence is naturally shown to rely on the comparison between the asymptotic rates of growth and interest in the bubble less economy.

This comparison in turn depends on technology and preferences as well as the nature of rents. The latter's rate of growth and degree of extant capitalization play a central role in the analysis. And Camerer (1999) on bubble and fads in asset price.Tirole sets conditions under which asset bubbles will lead to an expansion in steady-state capital, investment, employment and output. And Camerer considers the possibility that asset prices might deviate from intrinsic values based on market fundamentals, and he surveyed on three broad categories of theory: (a) growing bubbles (b) fads and (c) information bubbles.[17]

A study researched by Charles Leung (2003) shows that there is a recent growing recognition about the importance of the interactive chain between and among the housing markets and the macroeconomics. The study provides to a selective survey of the small efforts focused upon interplay between the housing markets and macroeconomics. The study examines the housing macroeconomics relation issues pertaining to housing taxation, housing cycle, and housing market and urban structural form. And also Ge Zhou (1985) found that economies with a lower rate of time discount, stronger "spirit of capitalism", or higher technology level, would allow for greater sizes of bubbles. By comparing the bubbly economy with the bubble less economy, one could see that the bubbles stimulate consumption, crowd out investment and slow down economic growth. This observation however is not accurate. And wealth equals the bubble plus the capital stock, making the marginal benefit of the bubble dependent on the capital stock.

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[17] Tirole, J.,"Asset Bubbles and Overlapping Generation", *Econometrica*, vol.53, 1985, pp.1500-1503.

Where money could be neutral and the bubble in his model has an impact on the real economy[18]

Galí J (2013) and also there is related because he found in his article (a) Monetary policy cannot affect the conditions for existence (or nonexistence) of a bubble, but it can influence its short-run behavior, including the size of its fluctuations. And (b) Contrary to the conventional wisdom a stronger interest rate response to bubble fluctuations (i.e. a "leaning against the wind policy") may raise the volatility of asset prices and of their bubble component.(C) The optimal policy must strike a balance between stabilization of current aggregate demand) which calls for a positive interest rate response to the bubble and stabilization of the bubble itself (and hence of future aggregate demand) which would warrant a negative interest rate response to the bubble.[19]

and also my thesis related by finance firm and the relationship between supply and demand like Jamie (2003) he tested The Effect of Demand and Supply factors on the Affordability of Housing and he wrote The demand for housing is indicated by price, household income, household composition, job choice, and housing consumption. As the price of a particular quality of housing unit increases, households demand less of that quality housing. The supply of housing responds only partially to cyclical movements in demand because of lags in construction. As

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[18] Ge, Z.,"Rational Bubbles and the Spirit of Capitalism", *Munich Personal Repec Archive*, 2008, No.44719, p.7.

[19] Gali, J.,"Monetary Policy and Rational Asset Price Bubbles", *Center for Economic Policy Research*, vol.2, 2013, p.30.

a result, rent or home prices moves pro-cyclically.[20] It's mean the income factor and the household factor and renter effect in the U.S. housing bubble.

Chapter 3 Causes of the Housing Bubbles

1 The causes of the bubble

Last chapter is presented about rational growing theories affect growing bubble with various factors and greater fool theory affect as the asset price and monetary system, interest rate and internal value. The greater fool theory showed how the buyers' stories increase interest rate. So next part will explain the macro implications of housing dynamics, meanwhile, are more important today than ever, following the largest residential real estate boom and bust in at least half a century, as well as the subsequent recession. As in most fields of economics, understanding the housing market means understanding both demand and supply. While the literature on housing demand is voluminous, progress in understanding the supply side has been much slower.[21]

Housing prices increased dramatically in many countries during the 1980's. Those increases accentuated differences across countries in the levels of housing prices. They have also caused attention to the dynamics of housing prices more generally. In the United States the phenomenal price increases, some of which have been attributed to "bubbles", in some regions and states during the mid- to late 1980s have given way to price declines. The bubbles seem to have been burst throughout the United States from the Northeastern States to the South and to

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[20] Jemie, D.,"The Effect of Demand and Supply Factors on the Affordability of Housing", *The Park Place Economist*, vol.11, p40.

[21] Paciorek, A.,"Supply Constraints and Housing Market Dynamics", *Divisions of Research & Statistics And Monetary Affairs Federal Reserve Board*, vol.3, 2008.p.9.

California.[22]There is positive relationship between housing price and the number of contracts traded if the price increase directly will effect in demand. So, the price is main factor to determine the housing situation and supply and demand but Joseph, Gyourko commented,

about the house price determined by the intersection of supply and demand.[23] Demand comes from new homebuyers, whose willingness to pay for housing is based on the utility gains from living in the city and expected housing price appreciation. The supply of homes for sale includes new homes produced by developers and old homes sold by existing homeowners. And Elias said about housing price level is dependent on large number of factors. Some of this factor is macroeconomic, i.e. the influence housing price in all regions within country in smaller way housing price level, growth and dynamics many differ significantly between different regional markets.[24] In next section will explain how the macroeconomics side and how affect to the US housing side.

1.1 Supply side of housing

The existing work on the relationship between house prices and supply in the housing market is sparse and uses existing home sales as the measure of supply. This focus on existing homes is not surprising since the majority of homes sold every period are existing homes.[25] Because the housing is durable well, housing supply is determined not only by the production decision of builders of new units but also decisions made by owners of housing (and their agents) concerning

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[22] Lannids, M.,"The dynamics of Housing Price: an International Perspective", *Journal of Urban Economics*, vol.64, 2004,p.4.

[23] Galaeser, E.,"Housing Supply and Housing Bubble", *Journal of Urban Economics*, vol.64, 2008, p.1.

[24] Oikarinan, E., "Studying on Housing Price Dynamics", *The Research Institute of the Finnish Economy, 2007 ,vol.9,* p.40.

[25] Conefery, T.,"Supply, Demand and Prices in U.S. Housing Market", *Journal of Economic literature Urban,* 2008, vol.23, p.5.

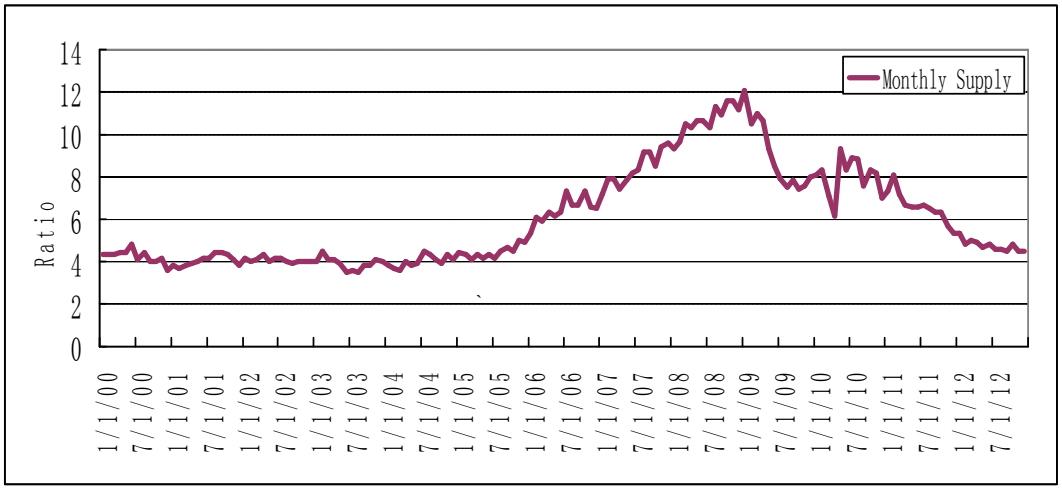
conversion of the existing stock housing. Denise Dipasqale stated about estimation supply there is low basic can estimating housing supply: reduced from estimation where generally price of function of supply and Demand factors and the more structural approaches where aggregate supply is estimated directly with contraction as function of price and the cost shifter.[26] So, there the meanings of price and cost how price-cost are treated in different supplier's structures. And the asset that home buyers believe that future price growth will resemble past price growth. Supply inelasticity then becomes a crucial determinant of the duration of a bubble. When housing supply is elastic, there need a new construction.

In other hand, Thomas Conefrey gives example about high level of month's supply has a significant negative effect on the number of new homes put on the market for sale, which contributes to the excess supply being wound down. Slowing this unwinding from a situation of high supply and falling prices, however, is the fact that new home sales depend positively on the growth rate of house prices, so falling prices also tend to depress house price sales. In the addition he found there particularly strong relationship is found between the change in house prices and months' supply for new homes. Indeed, supply conditions in the market for existing homes, the vacancy rate.[27]

Figure 1 Monthly Supply of Homes in the United States (MSACSR)

[26] Dipaqale, D.,"Why Don't I know More About Housing Bubble", *The Journal of Real Estate Finance And Economics*, vol.18, 1999, p.10.

[27] Conefery, T.,"Supply, Demand and Prices in U.S. Housing Market", *Journal of Economic literature Urban,* 2008, vol.23, p.7.



Source: www.census.gov.

The monthly supply is the ratio of houses for sale to houses sold. This statistic provides an indication of the size of the for sale inventory in relation to the number of houses currently being sold. The monthly supply indicates how long the current for sale inventory would last given the current sales rate if no additional new houses were built.[28] And as we see figure above is a normal housing market usually has 4.0 months of supply. The current 6.0 months of supply is significantly above normal. After the tax and expenses credit related activity ends, the months of supply will probably increase.

The construction industry and the real estate industry play key roles in Housing Supply Flexibility (HSF) given that homes supplied and sold include both new and existing homes as it showed before in the estimation of supply is determine the housing construction and the boost to consumer spending via a powerful positive wealth effect. As the market turned in 2006, housing contributed little to growth. Now in the bust, housing will subtract an estimated over one percentage point from growth this year and a percentage point and a half in 2008.Particularly, when compared with the low prevailing level of home sales, it has been widely conjectured that this “glut” of houses for sale is likely to be a factor continuing to

[28] www.research.stlouisfed.org.

depress house prices for some time.

1.2 Demand side of housing

Circumstances not only vary across buyers and sellers, they can also change over time, often for the worse. A buyer can initially afford to be selective, but eventually, if she is unable to purchase a house on favorable terms, her search becomes more desperate.[29] Likewise, atypical seller entering the housing market can at first afford to hold out for a high price but eventually, if he cannot find a buyer willing to pay his price, he becomes what real estate ads often call a motivated seller." That is, both buyers and sellers experience undesirable transitions if they do not buy or sell quickly enough transitions if they do not buy or sell quickly enough.

The homeownership rate has fallen from a 2004 peak of 69% to a 15-year low of 6 15%, cording to the US Census Bureau. I believe it is likely to shrink further until the market has worked off the inventory of unsold homes, credit becomes more widely available, and job and wage growth accelerate. As discussed, a small change in the homeownership rate can lead to big differences in the projected time it takes for the market to reach equilibrium.[30] In the same time the Buyers and sellers in the housing market are overwhelmingly amateurs, who have little experience with trading. High transactions costs, moral hazard problems, and government subsidization of owner-occupied homes have kept professional speculators out of the market. Therefore many sellers may begin the process of selling.

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[29] Anderson, A.,” Opportunistic Matching in the Housing Market”, *International Economic Review,* vol.48, 2007, pp.641-664.

[30] Kevin ,Chaver, In the Home Stretch? The U.S. Housing Market recovery, *Blackrock Investment Institute,* 2012, p10.

2 Mortgages crisis: causes and effects

Subprime borrowing was a major factor in the increase in home ownership rates and the demand for housing during the bubble years. The U.S. ownership rate increased from 64 percent in 1994 to an all-time high peak of 69.2 percent in 2004. The demand helped fuel the rise of housing prices and consumer spending, creating an unheard of increase in home values of 124 percent between 1997 and 2006. Some homeowners took advantage of the increased property values of their home to refinance their homes with lower interest rates and take out second mortgages against the added value to use for consumer spending. In turn, U.S. household debt as a percentage of income rose to 130 percent in 2007, 30 recent higher than the average amount earlier in the decade.[31]

And also Deteriorating comment about credit quality has put the subprime mortgage market into a downward spiral. Foreclosure filings surged 75% in 2007 amid declining home values and tighter credit, according to Realty Track. Banks and other lenders reported 2.2 million foreclosure filings during 2007, representing 1% of all U.S. households, up from 0.58% in 2006.[32] And the mortgage interest deduction is one of the oldest and largest tax expenditures in the federal income tax. In 2012, it cost the federal treasury an estimated $70 billion, more than all appropriations and outlays for rental housing ($62 billion).so it series factor to affect the causing bubble.[33]

3 Expenditure

When supply and demand are equal (i.e. when the supply function and demand function intersect) the economy is said to be at equilibrium. At this point, the market will normal situation but when the cost and expenditure of building high

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[31] Bianco, M., "The Subprime Lending Crisis", *CCH Federal Banking Law Reporter*, 2008, vol.1, p.7.
[32] Hample, B., The U.S Mortgage Crisis", *Credit Union National Assertion*, 2008,P.3.
[33] Austin ,Turner, How would Reforming the Mortgage Interest Deduction Affect the Housing Market, *The Urban Institution Perss*,2013, p.1.

increase will effect in market supply and M .Benjamin H. Harris said there is many reason to in expenditure and he moment "Transaction costs in US housing markets are substantial. In 2001, fees paid to a mortgage lender or broker averaged about $3,500, while title fees averaged $1,200 per loan. The median real estate commission paid by the seller was 5.5 percent of the sales price of the housing. The addition tax reason American Taxpayer Relief Act of 2012 (ATRA) permanently extended lower tax rates for most taxpayers. Because of ATRA, only a small percentage of taxpayers face substantial increases in marginal tax rates in 2013. ATRA did not extend the lower rates on ordinary income for high-income tax payers,

but it did cap the maximum rate on dividends at 20 percent (dividends were previously taxed at a maximum rate of 15 percent, but were scheduled to be taxed as ordinary income beginning in 2013).[34]

Excluding apartments simplifies our analysis, but in some ways the connection between construction costs and home prices is easier with apartments. In general, the marginal construction cost of an apartment is the price of building up. For example, Means data indicate that the price per square foot of building in a typical high rise of from 8 to 24 stories was nearly $110 per square foot in New York City

[34] Harris, Benjamin, New Estimates of Tax Reform on Housing price, *The Urban institution press, 2013,p.4.*

in 1999 This implies that the purely physical costs of construction for a new 1500 square foot unit in New York City is about $166,500 The construction cost so the increase the expenditure made high cost and its cause to increase mortgages rate and price. So the expenditure has high effect since the housing boom of the mid-2000 to 2012.[35]

4 Speculation

Speculative bubbles on asset markets can cause significant macroeconomic losses in terms of production and employment. The abrupt ending of the new economy boom at the time of the millennium contributed to a recession in a number of industrialized countries. The burst of the US real estate bubble in 2007/2008 was the cause of the recent financial and economic crisis[36] And Allen said the attempts to model short-run house price dynamics also led analysts to investigate speculative bubbles in housing markets.

And he adds the increase in real rates of house price appreciation led to expectations of further real appreciation. However, expecting some real house price appreciation in supply constrained markets that experience increases in aggregate demand for owner-occupied housing is not irrational (or speculative).[37]And as is defined in chapter 2 the interest rate going to increase continuously in a long time will be fool the investors to invest and to any independent reason make sharp and decrease the demand .in this situation the speculative will effect in the market and buyers and consumers.

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[35] Joseph, G.,"The Impact of Zoning on Housing Affordability", *R.S.* Mean Company, vol.30, p.40.

[36] Dreger, C., "Speculative Bubble on Housing Market" *Economic Bulletin*, 2011, vol.1,p.5.

[37] Allen, C.,"Where are the Speculative Bubbles in U.S. Housing Market?", *Journal of Housing Economics*, 2008, vol.18, p.5.

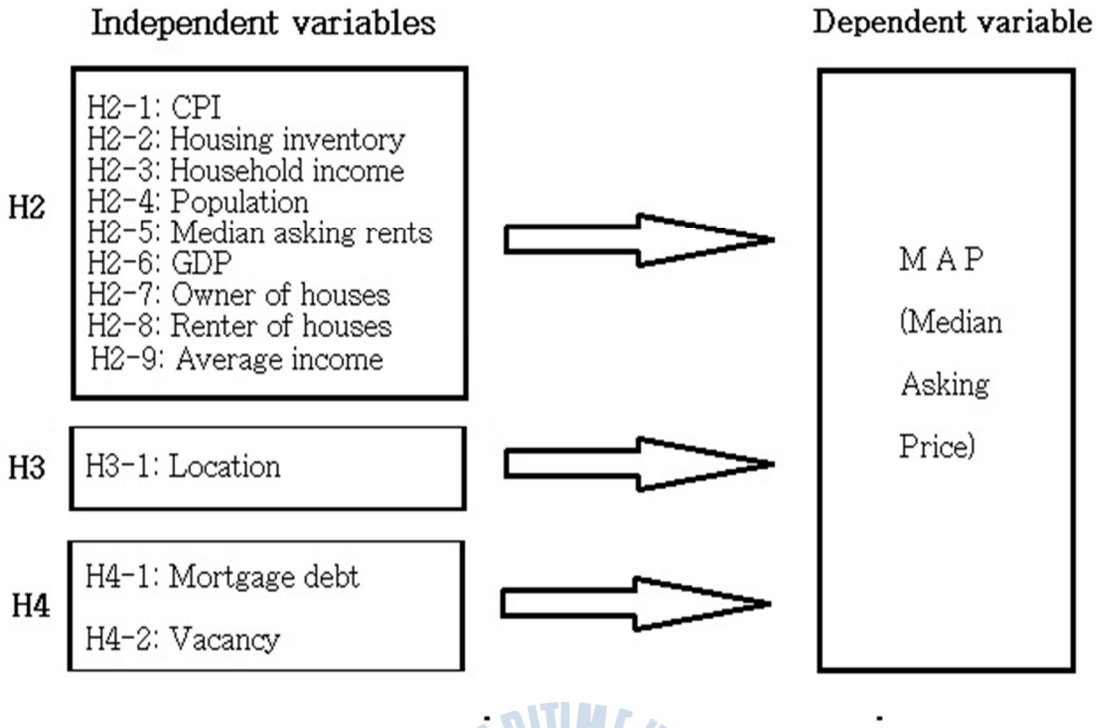
And the speculation effect in all my variables in this thesis such as income, owner renter, specially price and mortgage debt which main reason effect in U.S. housing bubble .But speculative home purchase transactions are not always funded through the banking system. If investors pay cash or secure non bank seller financing, they can postpone paying off liens, past due taxes, and housing code assessments against the property, and Consider what would happen if these speculators didn't exist. First, distressed property values would fall, freeing up resources for rehabbing or demolition. Second, a large amount of distressed property would go on the market, which would allow for large scale rehabilitation, redevelopment, or demolition and the associated economies of scale.[38] It is mean speculation effect in all the policy and market activity.

Chapter 4 Research design

1 Research model

The research model consists of 12 independent variables and 1 dependant variable: 9 independent variables belong to financing firms are given in Hypothesis 2; 1 variable belong to location is given in Hypothesis 3; and 2 variables belongs to mortgage firms are given in Hypothesis 4. The dependent variable is Median asking price of houses in U.S.

[38] Thomas, F.,"The Future of Financial Market Regulating", Federal Reserve Bank of Cleveland, 2011, vol.1, p.3.



Each variable will be calculated in a t-test. The t-test assesses whether the means of two groups are statistically different from each other. If the p-value of the variable in a t-test is less than 0.15, the analysis will be stopped, because the result means that the result of variable is in relationship with dependent variable. Alternatively, if the p-value of the variable by a t-test is over than 0.15, the analysis moves to stepwise regression.

Before moving to stepwise regression which gives the proper relationship between the independent and dependent variables, the model is formulated as follow to fit:

$$Y=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\beta_{10}X_{10}+\beta_{11}X_{11}+\varepsilon.$$

Where:

Y – The dependent variable;

X – The independent variables in each hypothesis;

α – The intercept with Y (dependent variable);

β – The slope of the line;

ε – The error of random.

And the formula is described as follows, when each variable is changed with its name:

$$(MAP)= +\beta_1(CPI)+\beta_2(HINV)+\beta_3(HINC)+\beta_4(POP)+\beta_5(MAR)+\beta_6(GDP)$$
$$+\beta_7(OWN)+\beta_8(RENT)+\beta_9(AVINC)+\beta_{10}(MORT)+\beta_{11}(VAC)+\varepsilon$$

Where:

(MAP) – Median asking price;

(CPI) – Consumer price index;

(HINV) – House inventory;

(HINC) – Housing income;

(POP) – Population;

(MAR) – Median asking rent;

(GDP) – Gross domestic product;

(OWN) – Owner of house;

(RENT) – Renter of house;

(AVINC) – Average income;

(VAC) – Vacancy rate.

(MORT) – Mortgage debt;

The stepwise regression is useful to solve the multi regression model. The focus of stepwise regression would be the question of what the best combination of independent variables would be to predict the dependent variable (Medium asking price). In the regression not all independent variables may end up in the equation. And the step-by-step iterative construction of a regression model involves automatic selection of independent variables. Stepwise regression can be achieved either by trying out one independent variable at a time and including it in the regression model if it is statistically significant, or by including all potential independent variables in the model and eliminating those that are not statistically significant, or by a combination of both methods.

My thesis is smaller by SPSS stepwise method with Wall Street and the housing bubble in 2004-2006,but there is different such as number of variables he

analysis three variables income, population and mortgage debt .And the period of research from 2000~2012 . He used few locations, but this research analysis all the direction and subprime mortgage crisis in 2008 in US focused mortgage variable and amount of loans and interest rate.

2 Research Hypothesis

The research hypotheses are based on the theoretical framework in chapter two, getting use of the previous studies and literature reviews, the study hypotheses are as follow:

Hypothesis 1:

There is a relationship between the number of intensity in the housing markets indicates the boom and bust in such a market.

Renting plays several roles over the lifecycle of the average householder. Most commonly, and rental housing serves a large and diverse population of nearly 39 million households among householders under age 25, some 78 percent are renters. Because that if the rate intensity increases that will bush the inviters take loans and increase mortgage debt. The research will adopt the qualitative method that reveals the boom and bust within specific period of time based on the number of transactions in mortgage loan and financial firms. The research main analysis focuses on the annual intensity of each transaction type, i.e., the number of transactions per person per time period; the focus will be on the annual frequency to avoid time periods with no transactions.

$$Intensity_t = \frac{\#\ Transactions_t}{\#\ people\ eligible\ for\ the\ transaction_t}.$$

The symbol ***t*** refers to the numbers of transactions in one year; the intensity of one type of transaction in year ***t*** in a sample group is defined as the number of

transactions of that type in year ***t*** divided by the number of people eligible to make that type of transaction at the beginning of year ***t***. For example, the intensity of buying a first home is determined by the number of the first home purchases divided by the number of non-owners at the beginning of the year. After get the result will compare it's with existing research intensity, If the result higher than existing research will determine the boom or bust.

The important feature of this research is that it observes not only the transaction activity, but also the transaction inactivity, depending on the comprehensiveness of the public records. This allows us to test the hypothesis that one group was more cautious , i.e., bought less , the number of transactions can be normalized by the total of people who could have made that transaction instead of the number of people who made the transaction.

Hypothesis 2:

There is relationship between finance factor and mortgage crisis in housing bubble affect in U.S. housing economy indicates the boom and bust in market.
The research will focus on the influence of financing firms on the housing bubble , the research will test the above hypotheses to prove whether the housing financing firms plays a role on the housing bubble in United States , as a case study or not . The financing firms play an important role in the housing bubble and mortgage crises due to their influence in the loans procedures and the limits and obligations they impose on the mortgage loans. The research will use the *SPSS* statistical software to analyze the data and figures related to financing firms, adopting the *t*-test and to specify which factor is the most effective in the housing bubble and mortgage crisis. This Hypothesis is supported 8 variables (GDP, Owner, Renter, MAR Population, Inventory, CPI, Housing Inventory, in chapter 4 will explain deeply about this variables

In case of high percentage of the influence of financing firms that exceed 0.15 it means that there is an influence of financing firms with statistical evidence and vice versa. The research will adopt the official common records for getting the needed statistical data and information. There is no statistical evidence related to the effects of the financing firms' factor on the mortgage and housing bubble at $\alpha \leq 0.15$.

Hypothesis 3:

There is a relation between the location factor and the housing bubble and mortgage crisis due to the differences in supply and demand from place to another.

Because if the supply focus in center cities and will be effect on the land price and cost so the investors will mortgage their housing to get liquidity or some time law interest because that my research will focus on the influence of location on the housing bubble, the research will test the above hypotheses to prove whether the location plays a role on the housing bubble in United States, as a case study or not. The research will use *SPSS* statistical software to analyze the available figures and data using the ***t***-test to specify which factor is the most effective in housing bubble and mortgage crisis. If the result high percentage of the influence of location that exceeds 0.15 it means that there is an influence of location on housing bubble and mortgage crisis with statistical evidence and vice versa. The research will adopt the official common records for getting the needed statistical data and information. There is no statistical evidence related to the effects of the location factor on the mortgage and housing bubble at $\alpha \leq 0.15$.

Hypothesis 4:

There is a relation between the mortgage firms and the housing bubble and mortgage crisis due to the relation between such firms and the mortgage rate laws and procedures.

The low mortgage interest rates contributed to the housing bubble by keeping monthly mortgage payments affordable for more buyers even as home prices rose and if it high interest rate the payments will be un affordable from this reason the research will focus on the influence of mortgage firms on the housing bubble and mortgage crisis, the research will test the above hypotheses to prove whether the mortgage firms play a role on the housing bubble in United States, as a case study or not. And This Hypothesis is supported 2 variables (vacancy rate, mortgage debt) The research will adopt the *SPSS* program to analyze the data and figures related to mortgage firms, adopting in that the *t*-test to specify the most influential factor in the housing bubble and mortgage crisis. if the result analyze is high percentage of the influence of mortgage firms that exceeds 0.15 it means that there is an influence of mortgage firms on housing bubble and mortgage crisis with statistical evidence and vice versa. The research will adopt the official common records for getting the needed statistical data and information. There is no statistical evidence related to the effects of mortgage firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$.

3 Definition of variables and collection of data

Household : the income which come persons living under one roof or occupying a separate housing unit, having either direct access to the outside (or to a public area). Where the members of a household are related by blood or law, they

constitute a family.[39] In 2012 the number of households in the United States more than tripled between (1982 and 2010) from 35 million to 117 million, and household growth outpaced population growth in every decade across this time period. So we must test is the number of household effect in mortgage crisis.

Population:(Statistics) The mean (usually arithmetic, but possibly geometric) of all members of a population or all possible values from which a sample can be taken, as opposed to a sample mean.[40] And US population increase 3.15% annually for example US gained 2.2 million people from 2010 to 2011.bcuse that its reason to be variable to effect in US market.

CPI: The consumer price index measures changes in the price level of a market basket of consumer goods and services purchased by households. The CPI in the United States is defined by the Bureau of Labor Statistics as "a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services.[41] The Consumer Price Index for United States of America fluctuates during the time period between the (1982-2012) as its highest value it was 5.3% and decreased in 1990 to lowest value in 2009 to be -0.5% .So its singe to say there is relationship and effect in market .

Mortgage debt : a loan secured by real property through the use of a mortgage note which evidences the existence of the loan and the encumbrance of that realty through the granting of a mortgage which secures the loan. However, the word mortgage alone, in everyday usage, is most often used to mean mortgage loan.[42] A lot of Americans mortgage their houses between (2005-2008), and the mortgage debt in 2008 was (14,661.300 billion dollar), so is the high level from

[39] www.businessdictionary.com.
[40] www.wiktionary.org.
[41] Boskin, J.,"Consumer Price Index", *Journal Economic Perspective* , 2008,vol.12, p.7.
[42] www.wiktionary.org.

mortgage debt affects in U.S economy so its evidence to check this variable.

Gross Domestic Product (GDP): GDP equals the value of all the goods and services produced for money in an economy, evaluated at their market prices.[43] And the latest value for GDP per capita (current US$) in United States was $48,112 as of 2011. Over the past 51 years, the value for this indicator has fluctuated between $48,112 in 2011 and $14500in 1982.And because GDP reflect the market situation its reason to analysis it effect or no.

Owner: A party that possesses the exclusive right to hold, use, benefit-from, enjoy, convey, transfer, and otherwise dispose of an asset or property.[44] The owner rate in US before 2000 was 65.3% and increased in 2005 to 68% rate and again came back in 2009 to 65.3% rate its reason also to effect in MAP.

Renter: An insurance policy providing coverage to a residential occupant who does not own the home. The policy covers personal belongings but provides no coverage on the structure or property.[45]If the cost of building in U.S is high the population will be rent the houses in same time if the rent is high cost will push the families to buy houses which cause high demined and rise the MAP that mean the rent variable can be reason to effect U.S. economy.

Collection of data

To investigate the possibility of a housing bubble, the data is divided to the entire

[43] www.wiktionary.org.
[44] www.businessdictionary.com.
[45] www.businessdictionary.com.

data set into two sub-sets: 1982 to 1997 to reflect a more stable period for housing prices (pre-bubble) and 1998 to 2012 during which housing prices soared, reflecting the bubble effect. Then its used multiple stepwise regression models were proposed using our 12 independent variables, with Median Asking Prices as the dependent variable. and The data is consists of time series of the period from 1982 till 2012 and different recourses, such as U.S. Department of commerce, U.S. Federal housing finance agency and U.S. Economic Time Series Page.

More details of Hypothesis:

Based on well understood relationships, the following hypotheses are proposed: H2-1: there is no relationship between CPI and MAP (this is used to answer hypothesis number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-2: there is no relationship between Housing Inventory and MAP (this is used to answer hypothesis number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-3: there is no relationship between Household Income and MAP (this is used to answer hypotheses 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-4: there is relationship between Population and MAP (this is used to answer hypotheses number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-5: there is no relationship between Median Asking Rents and MAP (this is used to answer hypothesis number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-6: there is no relationship a between GDP and MAP (this is used to answer hypotheses number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-7: there is no relationship between number of owner of house and MAP (this is used to answer hypotheses number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H2-8: there is no relationship between number of renter of house and MAP (this is used to answer hypotheses number 2: There is no statistical evidence related to the effects of financial firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H3-1: There is no statistical evidence related to the effects of the location factor on the mortgage and housing bubble at $\alpha \leq 0.15$.

H4-1: there is no relationship between Vacancy Rates and MAP (this used to answer hypotheses number 4: There is no statistical evidence related to the effects of mortgage firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

H4-2: there is no relationship between Mortgage Debt and MAP (this is used to answer hypotheses number 4: There is no statistical evidence related to the effects of mortgage firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

4 Research methodology

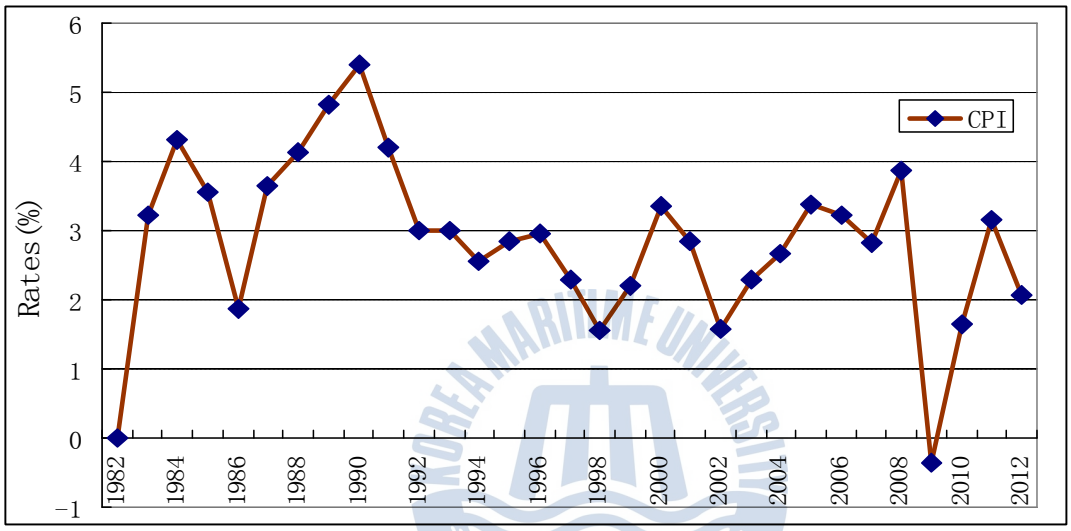
The research will adopt the official common records for getting the needed statistical data and information. And the study will follow the quantitative approach in analytical and descriptive manner depending on the collected data And the analysis data will use SPSS program first will use differences means table to know and determine the different between two time of variables, after that analysis and the data to show by geographic, then stepwise method (statical group) which content from model summary to know the level of strong relationship dependent and independent variables, then ANOVA to know by F test the variables is reject or no, if the result is rejected by $\alpha \leq 0.15$,will analysis by coefficient test by this analysis I can know every variable result reject or accept and I can determine how effect it's on MAP by my model.

Chapter 5 Results of Analysis and Hypotheses Tests

1 The Analyses of the Available Data

In this chapter is to describe all independent variable graphically and use variable data from 1982-2012 which registered from U.S census bureau and analysis it and show it by period before bubble and bubble time and compare it's to know how its effect in U.S. Market, and start from first CPI variable.

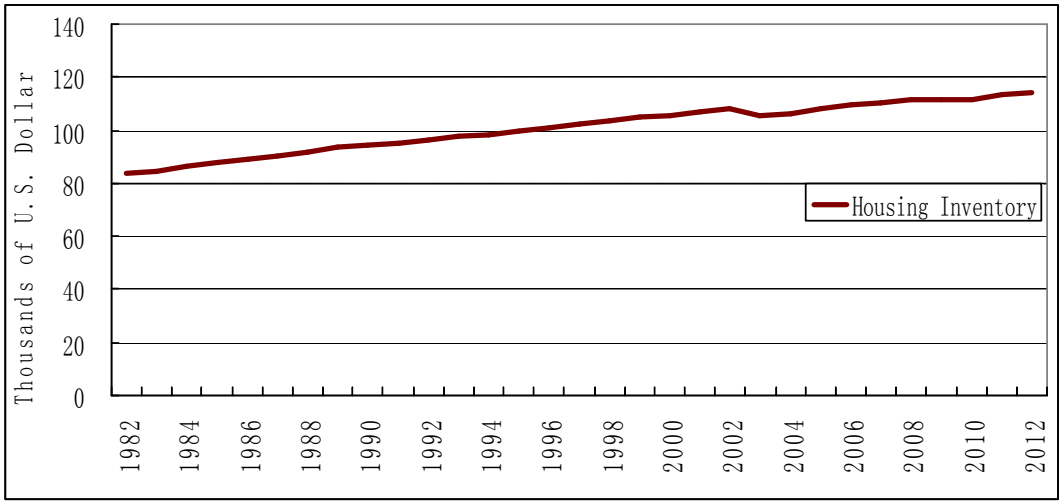
Figure 2: Consumer Price Index



Source: www.census.gov.

When you see the figure above shows that The Consumer Price Index for United States of America fluctuate during the time period between (1982-2012) as its highest value in 1990 and the lowest value in 2009.

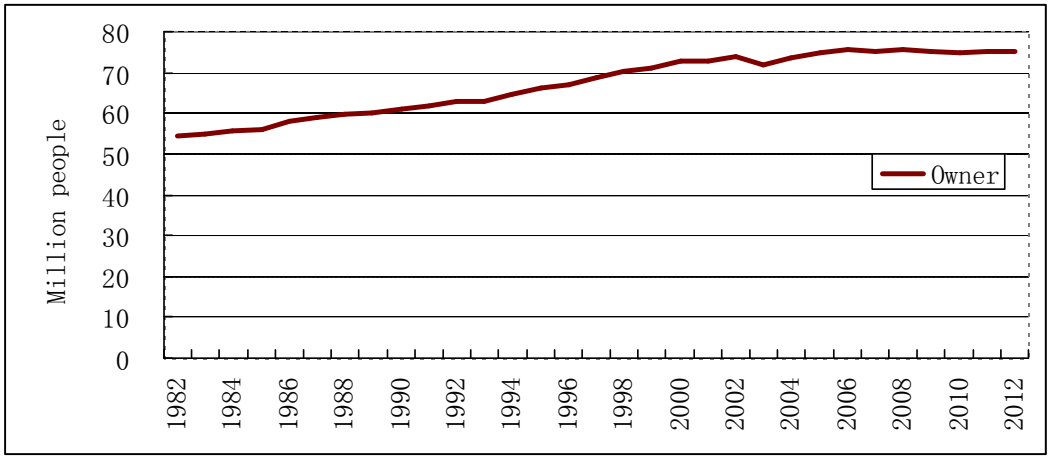
Figure 3 Housing Inventory



Source: www.census.gov.

From above figure the housing inventory in America on the rise with passage of time. The inventory rose residential units in the United States during the last year, an increase of 36.0% during the period from 1982 to 2012, and increased inventory of residential units in each U.S. the Housing Inventory indicator and MAP, and the pre-1997 period was variable MAP low and then increased as well Housing Inventory indicator and that indicates the presence of a changing relationship between MAP and Housing Inventory in the United States.

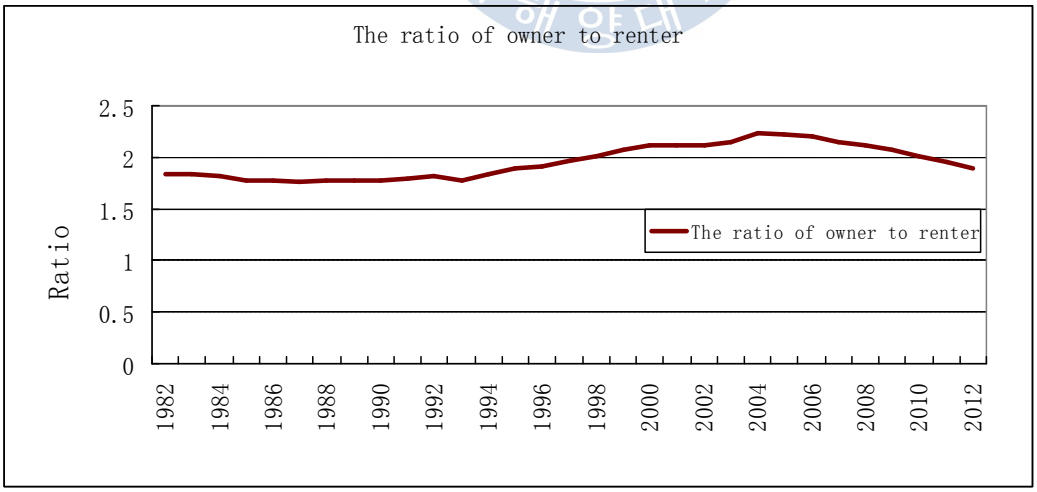
Figure 4 Owners of Houses



Source: www.census.gov

From the figure above that there is a growing increase in home ownership the United States rose significantly during the period 1982-2012.There is between the indicator home ownership and variable MAP, and the period before 1997 was MAP low and then increased as well indicator of home ownership and it indicates the existence of a relationship between a variable MAP and home ownership in the United States.

Figure 5 Intensity

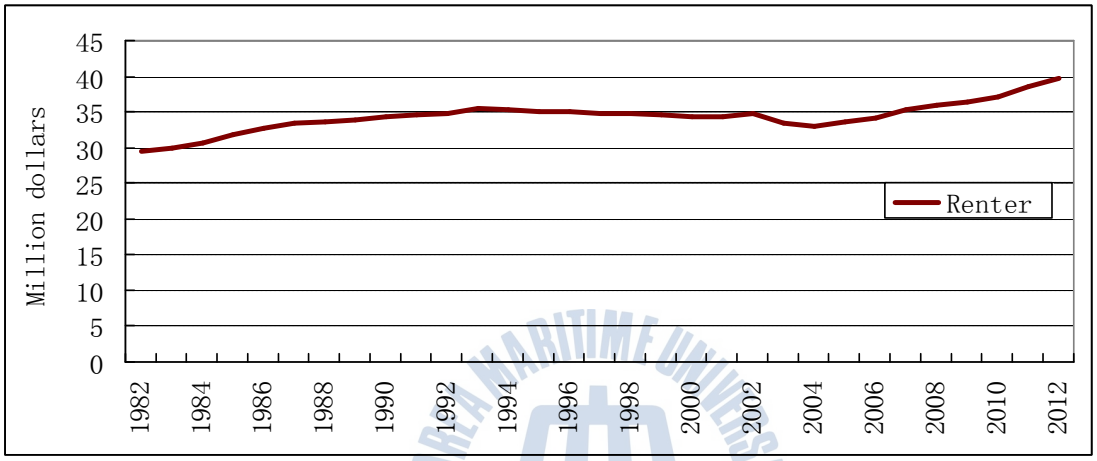


Source: www.census.gov

Last figure intensity measure the weight activity its relative to all housing owner and renter, its indicate the market demand of houses market and the weight

Intensity from (1982-1998) is low when we compare it with (1999-2012) and after that suddenly the rate is deceased by sharply way that mean there is effect from anther factors and as its explained last chapter the renters and investors is fallowing location and price and income from renter side and mortgage debt and vacancy rate and cost of building to investors and home owners.

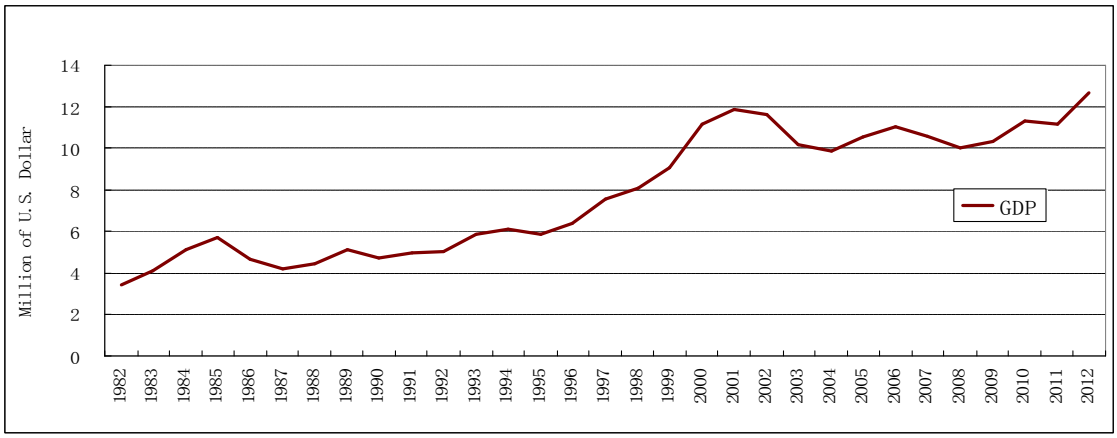
Figure 6 Rent Housing



Source: www.fhfa.gov

There is rise in rented homes in the United States during the 1982-2012 time period, knowing that he was a small decline in 2004, but in general there was a rise rose by 34.0% during the period 1982-2012, When we link between indicator rented housing and variable MAP, we can note the period before 1997 was variable MAP low and then increased as well indicator rented housing and it indicates the existence of a relationship between a variable MAP and rented housing in the United States.

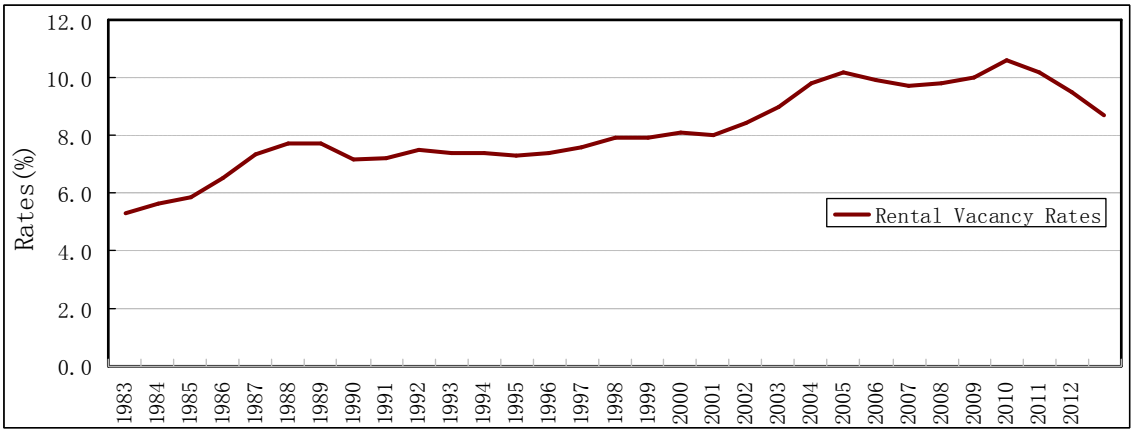
Figure 7 GDP



Source: www.census.gov

The results indicate that there is a continuous rise in the value of GDP at the level of the United States during the period 1982-2012, and reached a value of 12.643.68 dollar in the year 2012, recording an increase of 2.7% for the year 1982m, there is indicate between GDP and variable MAP, and the period before 1997 (variable MAP) is low and then increased as well indicator gross GDP and it indicates the existence of a relationship between a variable MAP and indicator GDP in the United States.

Figure 8 Rental Vacancy Rates

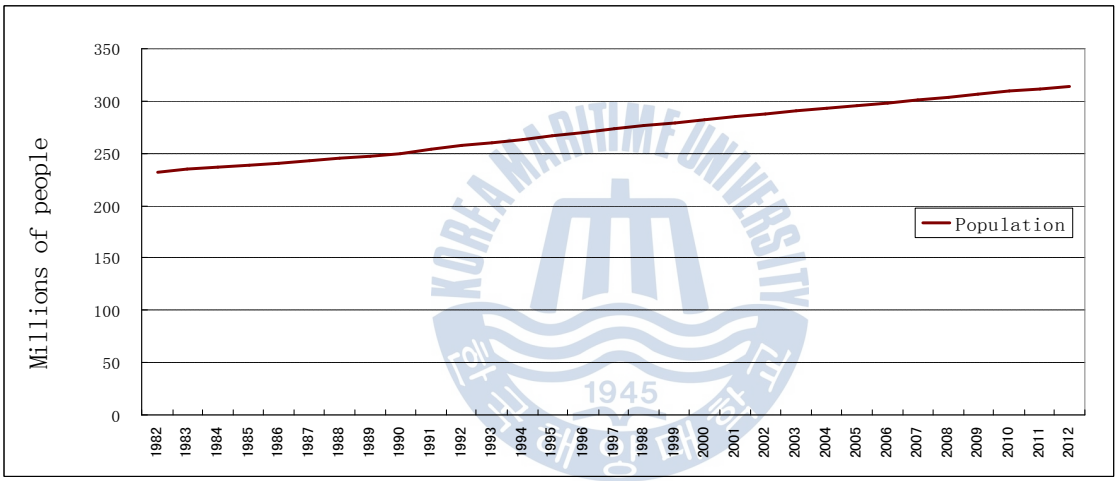


Source: www.census.gov

Generally note that there is a fluctuation in the vacancy rate knowing that there is a decrease in the period between 1988-2001 and then there was a rise in the

2002-2004 period and the other hand there was a reduction in the period 2006-2009 knowing that he was high during 2009 and took to fall again in the period 2010-2012 knowing he record the lowest value during the year 1982, where he scored 5.3 and its highest value in 2009, where he scored 10.6.there is between Rental Vacancy Rates and variable MAP, and the period before 1997 (variable MAP)is low and then increased as well indicator Rental Vacancy Rates and it indicates the existence of a relationship between a variable MAP and Rental Vacancy Rates in the United States.

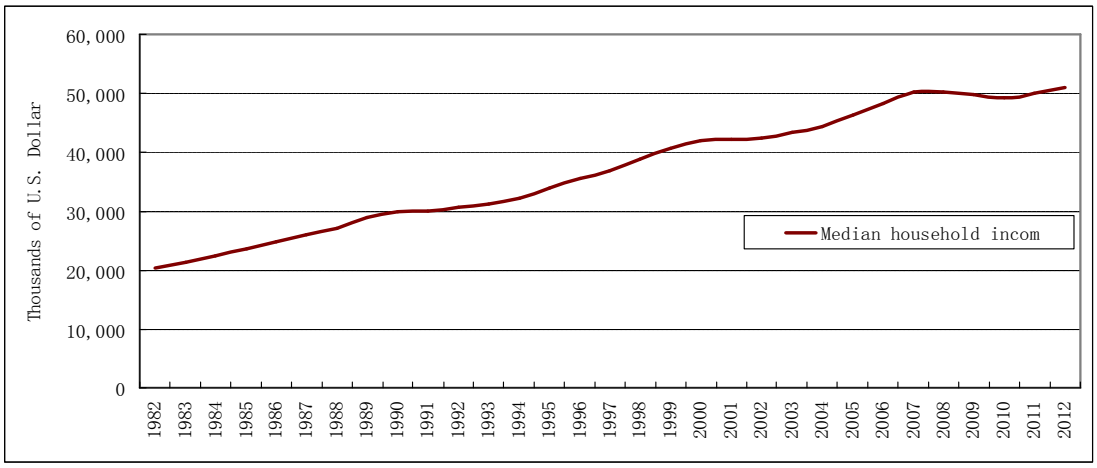
Figure 9 Population



Source: www.census.gov.

There is a continuous rise in the number of population in the United States, where the available data indicated that there is an increase of 3.15% in the period 1982-2012, there is effect between the number of population and variable MAP, and the period before 1997 to number of population is low and then increased as well variable MAP it indicates the existence of a relationship between a variable MAP and number of population in the United States.

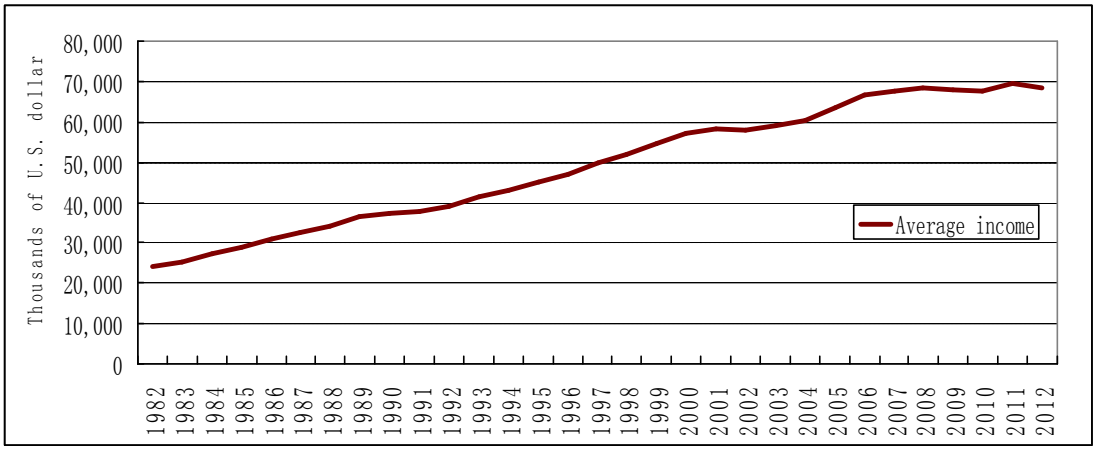
Figure 10 Median Household Incomes



Source: www.census.gov.

According to data indicate the figure above that there is a continuous rise in the Median household income where income rose between 2012 and 1982, as it recorded in 2012, $51,017 thousand dollars compared to $ 20,250 thousand dollars in 1982, and an increase of 1.15%. There is effect between Median household income and variable MAP, and the period before 1997 (variable MAP) is low and then increased as well indicator Median household income it indicates the existence of a relationship between a variable MAP and Median household income in the United States.

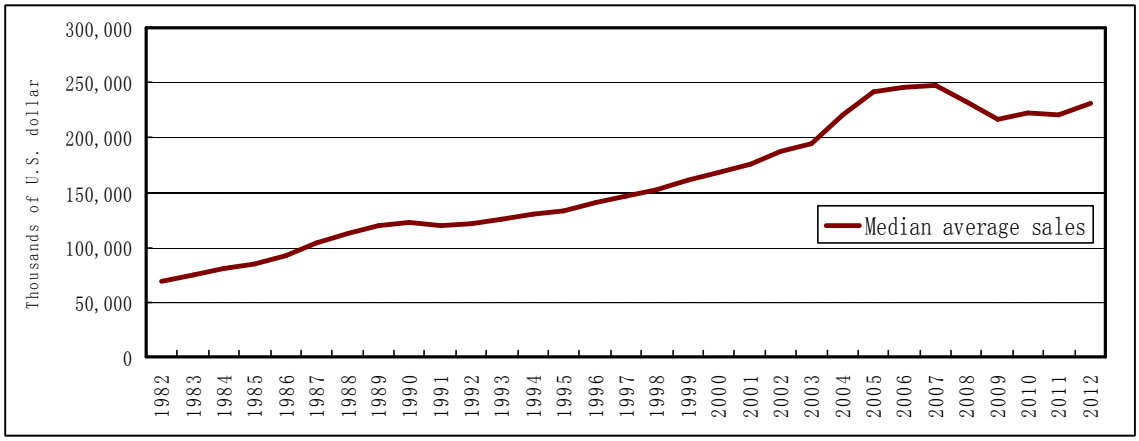
Figure 11 Average Income



Source: www.census.gov.

According to data indicate the figure above that there is a continuous rise in the average income where income rose between 2012 and 1982, as it recorded in 2012, 68,535 thousand dollars compared to 24,309 thousand dollars in 1982, an increase of 1.8%.There is effect between Average income and variable MAP, and the period before 1997 is variable MAP low, and then increased as well indicator Average income it indicates the existence of a relationship between a variable MAP and Average income in the United States.

Figure 12 Median and Average Sales Prices of New Homes Sold with land

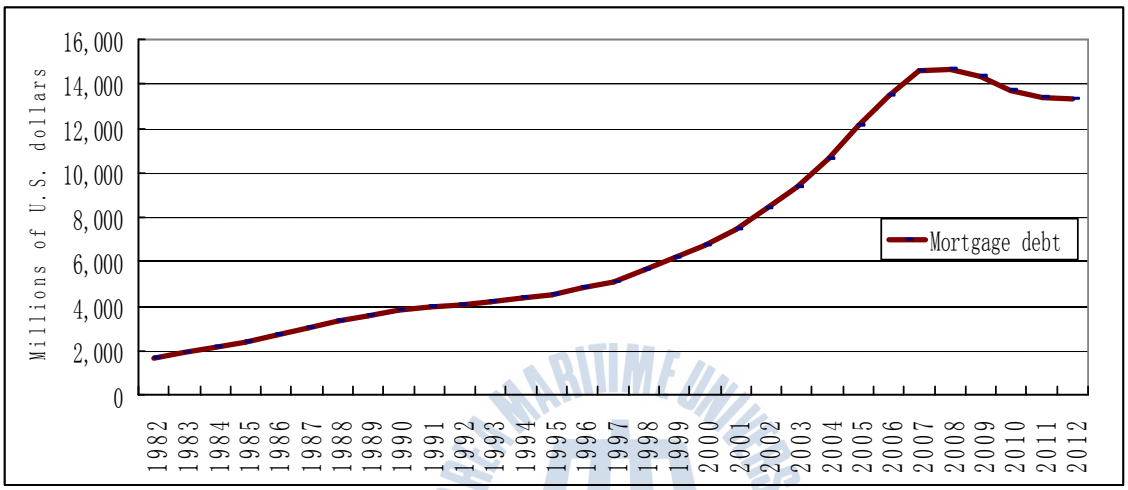


Source: www.fhfa.gov.

From the above figure that there is a fluctuation in the prices apartments with land

its high his stay as it recorded highest value in 2007, 247,900 the other hand, the lowest value in 1982 reaching 69, 300.

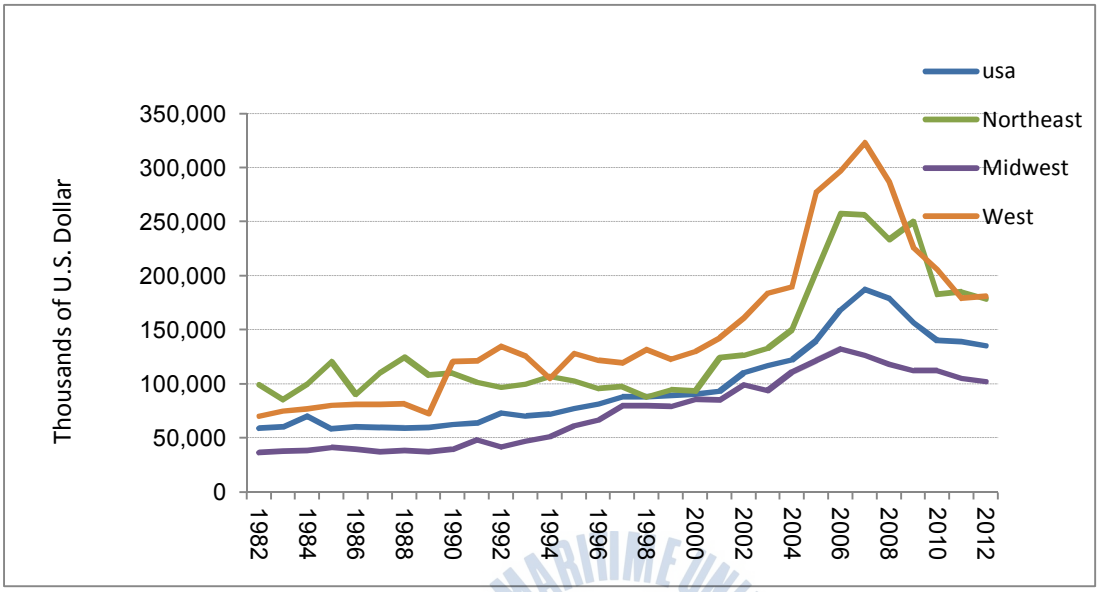
Figure 13 Mortgage Debt Outstanding by Holder [Billions of dollars]



Source: www.fhfa.gov

There was a decline in the mortgage debt in the period between 2008-2012 with it is still higher than the pre-2008 as it recorded highest value in 2008 at about 14,661.300 billion dollar. After the link between Mortgage debt outstanding and variable MAP, we can note that the period before 1997 (variable MAP) is low and then increased as well indicator Mortgage debt outstanding it indicates the existence of a relationship between a variable MAP and Mortgage debt outstanding in the United States.

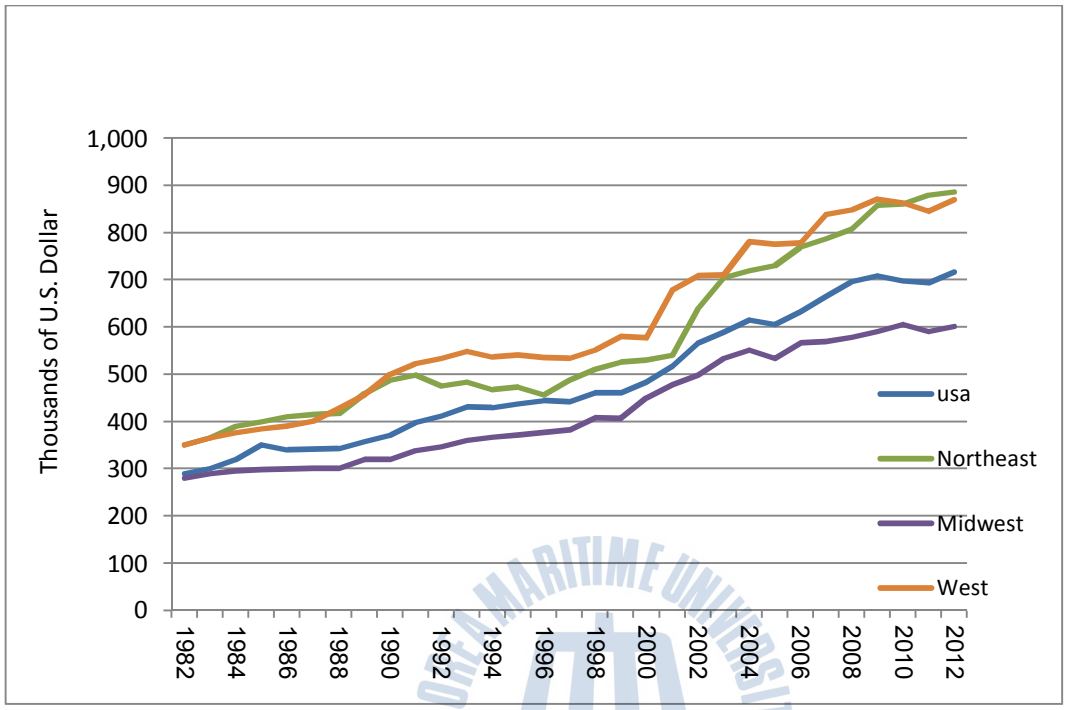
Figure 14 Median and Average Sales Prices of New Homes Sold without land



Source: www.fhfa.gov.

From the Looking at the figure above show that with different geographic areas, but the apartments prices without land to rise until 2007 and then begin to decline with the knowledge that he remains high compared with the pre-2007. And when we compare between regions, we can note that the west recorded the highest value, followed in the north and then the middle.there is indicate between New Homes Sold without land and variable MAP, and the period before 1997 (variable MAP) low and then increased as well indicator New Homes Sold without land it indicates the existence of a relationship between a variable MAP and New Homes Sold without land in the United States.

Figure 15 Median Asking Rent without land



Source: www.fhfa.gov.

The request of apartments From figure above without land with different geographical regions with a continuous rise during the period 1982-2012 with the existence of differences between the regions where the highest percentage recorded in the north and after the west, followed by the middle. When make linking between Median Asking Rent without land and variable MAP, can not the period before 1997 (variable MAP) is low and then increased as well indicator Median Asking Rent without land it indicates the existence of a relationship between a variable MAP and Median Asking Rent without land in the United States.

5.2 Results for the Research samples (Group of Statistics)

In this section analysis will be by Group of Statistics like stepwise method group table. And next table will measure the differences means between all variable (independent variables) and Median Asking Price before the bubble and bubble time.

Table1 Differences Means

variables	BUBBLE	N	Mean	Std. Deviation	Std. Error Mean
CPI	**pre-bubble**	16	127.675	21.3589	5.3397
	bubble time	15	195.889	21.8087	5.631
Housing Inventory	**pre-bubble**	16	93322.63	5877.153	1469.288
	bubble time	15	108843.4	3292.069	850.008
Population	**pre-bubble**	16	250654.56	13110.952	3277.738
	bubble time	15	295595.27	12122.308	3129.9664
Median household income	**pre-bubble**	16	28472.19	5055.204	1263.801
	bubble time	15	45936.5	4139.18	1068.732
MAR west	**pre-bubble**	16	462.69	75.204	18.801
	bubble time	15	751.53	112.535	29.056
GDP Mill.	**pre-bubble**	16	5208869.2	1023892.7	255973.17
	bubble time	15	10626660	1125861.2	290696.1
Owner	**pre-bubble**	16	60804.81	4462.497	1115.624
	bubble time	15	73757.2	1682.555	434.434
Renter	**pre-bubble**	16	33417.13	1968	492
	bubble time	15	35317.87	1846.23	476.694
Average Income	**pre-bubble**	16	36276.56	7739.284	1934.821
	bubble time	15	62589.77	5846.281	1509.503

Continually table1 Differences Means

variables	BUBBLE	N	Mean	Std. Deviation	Std. Error Mean
MAP(LAND)	pre-bubble	16	111162.5	24088.832	6022.208
	bubble time	15	207880	31966.661	8253.756
MAP U.S.	pre-bubble	16	67175	9152.231	2288.058
	bubble time	15	130486.67	32944.886	8506.333
MAP Northeast	pre-bubble	16	103081.25	10124.374	2531.094
	bubble time	15	170413.3	60481.93	15616.37
MAP Midwest	pre-bubble	16	46234.38	12709.53	3177.383
	bubble time	15	104273.3	16979.12	4383.991
MAP South	pre-bubble	16	59118.75	7298.878	1824.72
	bubble time	15	120386.7	32105.54	8289.614
MAP west	pre-bubble	16	99675	24043.64	6010.91
	bubble time	15	202520	65590.49	16935.39
Mortgage debt	pre-bubble	16	3455.531	1069.228	267.3069
	bubble time	15	10928.99	3334.232	860.895
Rental Vacancy Rates	pre-bubble	16	7.058	0.7947	0.1987
	bubble time	15	9.32	0.8946	0.231

We can note in above table the number of owner house pre-bubble less than other period despite to MAP increase with bubble house period and there is more loans in the same pried of bubble. Also there is another evidence to confirm the existence of housing bubble in US through 1998-2012. The percentage number of owner house compare renter house through the period 1998-2012 less greater than one thus means this period witnessed many demand of purchases house, The economic situation is very important graphically despite there is recession period

the Median Asking Price still increase the analytical analysis will prove that later. There is no differences between means of any independent variable through two time (pre-bubble and bubble house time).

Independent Samples Test

Now to test privacies result can use (independent sample ***t***-test) to compare P-value with 15%, if the value of sig less than 15% then will reject the variables that is means there is significant difference between means for each variable for two period.

Table 2 Independent Samples Test

variables	sig (2-tailed)	85% Confidence Interval of the Difference	
		Lower	Upper
Independent variables which Hypothesis 2			
CPI	**0.000**	-84.074	-52.3532
	0.000	-84.0903	-52.3369
Housing Inventory	**0.000**	-19053.456	-11988.094
	0.000	-19025.239	-12016.311
Population	**0.000**	-54234.19373	-35647.2146
	0.000	-54210.01735	-35671.39098
Median Household Income	**0.000**	-20871.746	-14056.885
	0.000	-20851.942	-14076.689
MARU.S.	**0.000**	-286.302	-177.356
	0.000	-288.022	-175.636
GDP Mill.	**0.000**	-6207475.805	-4628104.887
	0.000	-6210868.35	-4624712.341
Owner	**0.000**	-15463.096	-10441.679
	0.000	-15454.584	-10450.191
Renter	**0.010**	-3304.823	-496.66
	0.010	-3301.839	-499.645
Average Income	**0.000**	-31378.187	-21248.221
	0.000	-31341.736	-21284.673

Continually table 2 Independent Samples Test

Independent variables which Hypothesis 3			
MAP(LAND)	**0.000**	-117422.665	-76012.335
	0.000	-117719.396	-75715.604
MAP U.S.	**0.000**	-80819.078	-45804.255
	0.000	-81983.266	-44640.067
MAP Northeast	**0.000**	-98681.637	-35982.53
	0.000	-101104.698	-33559.468
MAP Midwest	**0.000**	-69008.86	-47069.057
	0.000	-69170.381	-46907.536
MAP South	**0.000**	-78112.711	-44423.122
	0.000	-79323.352	-43212.481
MAP west	**0.000**	-138673.705	-67016.295
	0.000	-140678.591	-65011.409
Independent variables which Hypothesis 4			
Rental Vacancy Rates	**0.000**	-2.8829	-1.6415
	0.000	-2.8862	-1.6381
Mortgage Debt	**0.000**	-9267.6803	-5679.2438
	0.000	-9378.0733	-5568.8509

The table above shows the value of sig less than 15% for all variables so its rejected and that means there is significant difference between means for each variable for two period and all above result are significant and the bubble is exist.

5.3 Estimation of the outcome results

Table 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.993[a]	.986	.978	5871.374	1.797

a. Predictors: (Constant), Hypothese 2 :
H2-1 CPI, H2-2 Housing Inventory H2-3 , median houshould income
H2-4 , MARU.S. H2-5 GDP Mill. H2-6 Owner H2-7 , Renter .
H2-8 , Population H2-9 , Average Income (Numbers in thousands)
Hypotheses 4:
H3-1 Mortgage debt H3-2 Rental Vacancy Rates

The table above show there is strong relationship between all independent variables on MAP by 99% and the value of R square show how the independent variable can be explain MAP (by 98%) this result is significant by F-test in ANOVA table below where p-value = 0.00 less than 15% also there is no serial correlation problem where the value of Durbin- Watson =1.8 nearly 2 then doesn't have serial correlation. and to know The model is fitted as:

Table 4 ANOVA Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.68E+10	11	4257190869	123.493	.000[a]
	Residual	6.55E+08	19	34473028.02		
	Total	4.75E+10	30			

a. Predictors: (Constant), Hypothese 2 :
H2-1 CPI, H2-2 Housing Inventory H2-3 , median houshould income
H2-4 , MARU.S. H2-5 GDP Mill. H2-6 Owner H2-7 , Rentei .
H2-8 , Population H2-9 , Average Income (Numbers in thousands)
Hypotheses 4:
H4-1 Mortgage debt H4-2 , Rental Vacancy Rates

Table 5 Coefficient Test

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	21773.86	80633.73		.790	.439		
H2-1	CPI	1575.606	1025.089	-1.609	-1.537	.141	.001	1509.642
H2-2	Housing Inventory	-5.547	5.170	-1.282	-1.073	.297	.001	1965.161
H2-3	Owner	9.960	4.815	1.849	2.068	.052	.001	1101.255
H2-4	Renter	3.912	4.169	.208	.938	.360	.015	67.457
H2-5	GDP	-.005	.002	-.346	-2.408	.026	.035	28.436
H2-6	MAR U.S.	376.238	140.828	1.310	2.672	.015	.003	331.007
H2-7	Population	-1.184	1.253	-.774	-.946	.356	.001	922.579
H2-8	Median houshould income	-.468	2.999	-.117	-.156	.878	.001	778.881
H2-9	Average Income (Numbers in thousand)	2.779	2.533	1.047	1.097	.286	.001	1253.530
H4-1	Rental Vacancy Rates	7030.939	3764.563	-.607	-4.524	.000	.040	24.788
H4-2	Mortgage debt	11.561	2.865	1.305	4.035	.001	.007	144.095

a. Dependent Variable: MAP U.S.

H2-1: there is no relationship at alpha 5% between CPI house and MAP (it is rejected null hypotheses this means there is significant effect between number of owner of house and MAP because p-value = .141 less than or equal 15% and the

type of effect is positive according that when number of owner of house increase by one unit MAP increase by 1575.6 unit).

H2-2: there is no relationship at alpha 5% between Housing Inventory and MAP (The hypothesis is accepted)

H2-3: there is no relationship at alpha 5% between number of owner of house and MAP (it is rejected null hypotheses this means there is significant effect between number of owner of house and MAP because p-value = .052 less than or equal 15% and the type of effect is positive according that when number of owner of house increase by one unit MAP increase by 10 unit)

H2-4: there is no relationship at alpha 5% between number of renter of house and MAP (The hypothesis is accepted) H2-6: there is no relationship at alpha 5% between GDP and MAP (it is rejected null hypotheses this means there is significant effect between GDP and MAP because p-value = .026 less than or equal 5% and the type of effect is negative according that when GDP increase by one unit MAP decrease by 0.005 unit)

H2-5: there is no relationship at alpha 5% between GDP and MAP (it is rejected null hypotheses this means there is significant effect between GDP and MAP because p-value = .026 less than or equal 5% and the type of effect is negative according that when GDP increase by one unit MAP decrease by 0.005 unit)

H2-5: there is no relationship at alpha 5% between Median Asking Rents and MAP (it is rejected null hypotheses this means there is significant effect between Median Asking Rents and MAP because p-value = .015 less than or equal 5% and the type of effect is positive according that when Median Asking Rents increase by one unit MAP increase by 376 unit)

H2-4: there is no relationship at alpha 5% between Population and MAP (The

hypothesis is accepted)

H4-1: there is no relationship at alpha 5% between Vacancy Rates and MAP(it is rejected null hypotheses this means there is significant effect between Vacancy Rates and MAP because p-value = .000 less than or equal 5% and the type of effect is negative according that when Vacancy Rates increase by one unit MAP decrease by 1.1% unit).

H4-2: there is no relationship between Mortgage Debt and MAP (It's rejected null hypothesis this means there is effect between Mortgage Debt and MAP because p-value = .001 less than or equal 5% and the type of effect is positive according that when Mortgage Debt house increase by one unit MAP increase by 11.5 unit).

5.4 Summary of the Hypotheses test in the housing market

Result for the main three hypotheses: The hypothesis 2 variables are H2-4, H2-7, H2-8, H2-9 H2-6, H2-5 H2-3 and H2-1 and the hypothesis 4 is H4-1 and H4-2 and hypothesis 3 is H3-1 as we see in next table:

Table 6 Result of Variables

Model		Sig.	Result Hypothese
1	(Constant)	.439	
H2-1	CPI	.141	rejected
H2-2	Housing Inventory	.297	accepted
H2-3	Owner	.052	rejected
H2-4	Renter	.360	accepted
H2-5	GDP Mill.	.026	rejected
H2-6	MARU.S.	.015	rejected
H2-7	Population	.356	accepted
H2-8	median houshould income	.878	accepted
H2-9	Average Income (Numbers in thousanc	.286	accepted
H4-1	Rental Vacancy Rate	.000	rejected
H4-2	Mortgage debt	.001	rejected

a. Dependent Variable: MAP U.S.

To Answer Hypotheses 2 (reject or accept)

(8 parts of partial hypotheses used to answer hypothesis number **2:** There is no statistical evidence related to the effects of the financing firm's factor on the mortgage and housing bubble at $\alpha \leq 0.15$).

Accept hypothesis is:

There is no relationship at alpha 5% between H2-4, H2-7, H2-8 and H2-9 and MAP (The hypothesis is accepted).

Reject hypothesis:

For H2-6, H2-5 H2-3 and H2-1 the P-value =0.015, 0.026, .052 and .141 respectively less than .15 (I use ***t***-test - table coefficiant**).**

Design and Conclusion:

H2-6: between Median Asking Rents and MAP because p-value = .015less than

or equal 15% and the type of effect is positive according that when Median Asking Rents increase by one unit MAP increase by 376 unit).

H2-5: GDP and MAP because p-value = .026less than or equal 15% and the type of effect is negative according that when GDP increase by one unit MAP decrease by 0.005 unit)

H2-3: of CPI of house and MAP p-value = .141 less than or equal 15% and the type of effect is positive according that when number of owner of house increase by one unit MAP increase by 10 unit).

H2-1 of owner of house and MAP p-value = .052 less than or equal 15% and the type of effect is positive according that when number of owner of house increase by one unit MAP increase by 1575.6 unit).

To answer Hypotheses 3 (reject or accept)

State Hypotheses: H3. There is no statistical evidence related to the effects of the location factor on the mortgage and housing bubble at $\alpha \leq 0.15$.

According the result in table (above) the place of houses effect on MAP where in west area US. And the MAP is very high (= 202520 $) comparing other location. In next table:

Table 7 Differences Means Location Variable

MAP Midwest	**pre-bubble**	16	46234.38
	bubble time	15	104273.33
MAP South	**pre-bubble**	16	59118.75
	bubble time	15	120386.67
MAP west	**pre-bubble**	16	99675
	bubble time	15	202520

Testing hypotheses: the P-value =0.000 less than .15 (I use T-test-table independent sample t-test).

Design and Conclusion: sig less than 0.15 then and reject null hypotheses and thus mean the location effect on bubble and mortgage in west area more than other location.

To Answer Hypotheses 4 (reject or accept)

(Two parts of partial hypotheses used to answer hypothesis number 4. There is no statistical evidence related to the effects of mortgage firm factor on the mortgage crisis and housing bubble at $\alpha \leq 0.15$).

Testing hypotheses: By use *t*-test in table coefficiants (for H4-1 and H4-2 the P-value =0.000 less than .15).

Design and Conclusion:

H4-1 : p-value = .000less than or equal 15% and the type of effect is negative according that when Vacancy Rates increase by one unit MAP decrease by 1.1% unit.

H4-2 : p-value = .001less than or equal 15% and the type of effect is positive according that when Mortgage Debt house increase by one unit MAP increase by 11.5 unit and effect by default negatively with interest rate).

Chapter 6 Research findings and implications

Both of two variables vacancy rate and mortgage debt are rejected because alpha less than 15% that means both of two variables effect to MAP (dependant variable) , and now mortgage crisis is continually effect U.S. economy by the result of

There is significant effect between Vacancy Rates and MAP because p-value = .000 less than or equal 15% and the type of effect is negative according that when Vacancy Rates increase by one unit MAP decrease by 1.1% unit).
There is significant effect between Mortgage Debt and MAP because p-value = .001 less than or equal 15% and the type of effect is positive according that when Mortgage Debt house increase by one unit MAP increase by 11.5 unit).

The suitable way to fix such crises is to decrease the mortgage loans, by decrease interest rate in home investor's loan that will be discourage the investor's to take loans because Housing activity is directly impacted by mortgage rates. Higher interest rates increase housing costs and reduce the number of qualified borrowers, thus, a decline in home sales and drop-off in starts. Conversely, lower interest rates increases housing affordability and spurs homes sales and housing starts. And increase the obligations of loans such as decrease the Permits of house building in a few areas such as west of U.S because its focus there, The building permits are control the house investing, also Permit activity provides insight into housing and overall economic activity in upcoming months. It is so important that it is included in the index of leading economic indicators.

The number of owner house pre-bubble less than other period despite to MAP increase with bubble house period and I can notes there is more loans in the same pried of bubble. Also there is another evidence to confirm the existence of bubble house in US through 1998-2012 the percentage number of owner house compare renter house through the period 1998-2012 less greater than one thus means this period witnessed many demand of purchases house.
There is differences means between all variable (independent variables) and Median Asking Price before bubble and bubble time. Also the economic situation is very important graphically despite there is recession period the Median Asking Price still increase. And its explained before how the variables effect in MAP

which effect in mortgage crisis, also (location variable) The place of houses effect on MAP where in west area of US the MAP is very high. And MAP increase effects by the test variables are:

There is no significant relationship at alpha 15% between CPI and MAP. H2: There is no significant relationship at alpha 15% between Housing Inventory and MAP.

There is no significant relationship at alpha 15% between Household Income and MAP.

There is no significant relationship at alpha 15% between Population and MAP.

There is significant effect between Median Asking Rents and MAP because p-value = .015 less than or equal 15% and the type of effect is positive according that when Median Asking Rents increase by one unit MAP increase by 376 unit).

There is significant effect between GDP and MAP because p-value = .026 less than or equal 15% and the type of effect is negative according that when GDP increase by one unit MAP decrease by 0.005 unit)

There is significant effect between number of owner of house and MAP because p-value = .052 less than or equal 15% and the type of effect is positive according that when number of owner of house increase by one unit MAP increase by 10 unit).

There are three major limitations of the study, the significance of certain variables in Some in U.N. the factors includes in the regression model; and the prediction power of the median asking price in the study. Ensuring that the proper metrics differentiating risks are applied in decision making is only one aspect of a process that enables a bank to mitigate excessive risk taking. Another is measuring

expected and unexpected losses with some degree of accuracy. Such capabilities are highly dependent on having sufficient and accurate data to build these views of geographic location and other features. For example, the value of a fixed rate 30-year mortgage will generally be more sensitive to changes in interest rates than a short-term, simply due to differences in interest rate risk profiles. And Because of the lack of information and statistical tables, it took a long time to get to consider doing one of the most important obstacles in this research paper.

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Independent Variables Data

Year	CPI Rate	Housing Inventory (Thousands)	Owner (Million)	Renter (Million)	GDP (Million)
1982	0	83,731	54,237	29,495	3,414,258
1983	3.21%	84,565	54,671	29,894	4,086,741
1984	4.32%	86,346	55,671	30,675	5,121,073
1985	3.56%	87,887	56,152	31,736	5,696,197
1986	1.86%	89,145	57,915	32,602	4,663,943
1987	3.65%	90,517	58,700	33,320	4,218,652
1988	4.14%	92,020	59,755	33,734	4,442,010
1989	4.82%	93,489	60,248	33,976	5,135,197
1990	5.40%	94,224	61,010	34,242	4,695,681
1991	4.21%	95,253	61,823	34,568	4,982,414
1992	3.01%	96,391	62,998	34,730	5,037,580
1993	2.99%	97,728	63,136	35,558	5,874,217
1994	2.56%	98,695	64,739	35,246	6,144,251
1995	2.83%	99,985	66,041	34,943	5,859,301
1996	2.95%	100,984	67,143	35,059	6,379,381
1997	2.29%	102,202	68,638	34,896	7,591,011
1998	1.56%	103,534	70,097	34,831	8,107,365
1999	2.21%	104,928	71,250	34,470	9,068,962
2000	3.36%	105,720	72,593	34,417	11,140,862
2001	2.85%	107,010	72,593	34,417	11,863,890
2002	1.58%	108,539	73,713	34,826	11,611,887
2003	2.28%	105,560	72,054	33,506	10,176,980
2004	2.66%	106,588	73,575	33,013	9,869,765
2005	3.39%	108,231	74,553	33,678	10,526,003
2006	3.23%	109,575	75,380	34,195	11,036,875
2007	2.83%	110,306	75,159	35,147	10,565,706
2008	3.86%	111,409	75,566	35,843	10,008,363
2009	-0.36%	111,344	75,014	36,330	10,336,894
2010	1.64%	111,860	74,791	37,069	11,283,322
2011	3.16%	113,534	75,091	38,443	11,159,339
2012	2.07%	114,513	74929	39583	12,643,680

Year	Rental Vacancy Rates	Population (Million)	Median household income (Thousands)	Average Income (thousand)	Median and Average Sales Prices of New Homes Sold with land
1982	5.3	232,188.000	20,250	24,309	69,300
1983	5.6	234,307.000	21,400	25,401	75,300
1984	5.9	236,348.000	22,415	27,464	79,900
1985	6.5	238,466.000	23,618	29,066	84,300
1986	7.4	240,651.000	24,897	30,759	92,000
1987	7.7	242,804.000	26,061	32,410	104,500
1988	7.7	245,021.000	27,225	34,017	112,500
1989	7.2	247,342.000	28,906	36,520	120,000
1990	7.2	250,132.000	29,943	37,403	122,900
1991	7.5	253,493.000	30,126	37,922	120,000
1992	7.4	256,894.000	30,636	38,840	121,500
1993	7.4	260,255.000	31,241	41,428	126,500
1994	7.3	263,436.000	32,264	43,133	130,000
1995	7.4	266,557.000	34,076	44,938	133,900
1996	7.6	269,667.000	35,492	47,123	140,000
1997	7.9	272,912.000	37,005	49,692	146,000
1998	7.9	276,115.000	38,885	51,855	152,500
1999	8.1	279,295.000	40,696	54,737	161,000
2000	8.0	282,162.000	41,990	57,135	169,000
2001	8.4	284,969.000	42,228	58,208	175,200
2002	9.0	287,625.000	42,409	57,852	187,600
2003	9.8	290,108.000	43,318	59,067	195,000
2004	10.2	292,805.000	44,334	60,466	221,000
2005	9.9	295,517.000	46,326	63,344	240,900
2006	9.7	298,380.000	48,201	66,570	246,500
2007	9.8	301,231.000	50,233	67,609	247,900
2008	10.0	304,094.000	50,303	68,424	232,100
2009	10.6	306,772.000	49,777	67,976	216,700
2010	10.2	309,350.000	49,276	67,392	221,800
2011	9.5	311,592.000	50,054	69,677	220,500
2012	8.7	313,914.000	51,017	68,535	230,500

Year	Median Asking Price with land (U.S. Thousands dollar)					Mortgage debt outstanding by holder[Billions of dollars]
	U.S.	Northeast	Midwest	South	West	
1982	59,100	99,000	36,150	50,500	70,200	1,676.1
1983	60,200	85,500	37,900	55,600	75,200	1,871.7
1984	70,400	100,000	38,400	60,600	76,900	2,120.6
1985	58,500	120,300	40,900	59,200	80,200	2,370.3
1986	60,200	90,200	39,300	60,000	80,600	2,657.9
1987	59,500	110,600	37,300	53,400	81,100	2,996.2
1988	59,200	124,500	38,100	56,400	81,300	3,313.1
1989	59,500	108,100	36,800	57,900	72,700	3,585.4
1990	62,700	109,900	39,200	50,400	120,500	3,788.2
1991	63,700	101,600	48,300	49,700	120,900	3,929.8
1992	73,300	96,800	41,500	57,700	134,900	4,043.4
1993	69,900	99,700	46,900	58,600	125,800	4,174.8
1994	72,200	107,100	51,000	63,200	105,100	4,339.0
1995	77,500	102,600	61,400	65,400	128,300	4,524.8
1996	81,200	95,700	66,800	70,300	121,900	4,792.4
1997	87,700	97,700	79,800	77,000	119,200	5,104.8
1998	87,800	88,200	79,400	81,300	131,600	5,589.5
1999	89,400	94,500	79,300	81,700	122,900	6,195.1
2000	90,400	93,200	85,800	82,500	130,000	6,752.6
2001	93,300	124,100	85,100	83,700	142,600	7,460.4
2002	110,600	126,200	99,400	96,900	160,800	8,361.2
2003	117,100	132,700	93,700	107,600	184,000	9,376.2
2004	122,100	150,000	111,000	104,500	189,600	10,650.7
2005	140,100	203,800	121,600	124,100	277,300	12,097.7
2006	168,800	257,500	132,500	149,100	296,900	13,481.9
2007	187,600	255,900	126,200	172,700	323,300	14,566.0
2008	178,900	233,800	117,900	171,900	286,800	14,661.3
2009	156,900	250,000	112,400	150,800	225,900	14,370.0
2010	140,300	182,500	112,500	134,200	206,000	13,712.3
2011	138,600	185,200	105,400	135,900	179,200	13,383.8
2012	135,400	178,600	101,900	128,900	180,900	13,276.2

Year	Median Asking Rent without land (U.S. Thousands dollar)					Mortgage debt outstanding by holder[Billions of dollars]
	U.S.	Northeast	Midwest	South	West	
1982	290	350	280	260	350	1,676.1
1983	301	366	290	265	366	1,871.7
1984	320	390	295	270	377	2,120.6
1985	350	400	298	275	385	2,370.3
1986	340	410	299	285	390	2,657.9
1987	341	415	300	300	401	2,996.2
1988	343	417	301	311	428	3,313.1
1989	358	459	320	316	456	3,585.4
1990	371	487	319	318	500	3,788.2
1991	398	498	339	347	523	3,929.8
1992	411	476	347	354	533	4,043.4
1993	431	483	360	372	548	4,174.8
1994	429	467	367	375	536	4,339.0
1995	438	473	371	393	541	4,524.8
1996	444	457	377	417	535	4,792.4
1997	442	487	382	404	534	5,104.8
1998	461	511	408	419	551	5,589.5
1999	461	526	406	424	580	6,195.1
2000	483	530	449	452	577	6,752.6
2001	518	541	478	487	679	7,460.4
2002	566	640	498	534	708	8,361.2
2003	589	705	533	556	710	9,376.2
2004	615	719	551	575	781	10,650.7
2005	605	730	534	560	775	12,097.7
2006	633	770	566	597	777	13,481.9
2007	665	787	569	640	838	14,566.0
2008	696	808	579	676	848	14,661.3
2009	708	857	590	671	871	14,370.0
2010	698	861	605	657	863	13,712.3
2011	694	879	591	655	845	13,383.8
2012	717	886	602	666	870	13,276.2