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INVESTOR SENTIMENT AND HOUSE PRICES: PRE-BUBBLE VERSUS POST-BUBBLE

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ABSTRACT

We examine house prices in the United States between 1987 and 2011; we wish to discover and measure the role played by investor sentiment and other traditional factors in describing the now-deflating real estate bubble of the mid 2000's. Several variables are associated with declining house prices; we find that with increasing unemployment, increasing foreclosure activity, rising loan delinquencies, and increasing consumer fears concerning job prospects, housing values declined. We discover also that increasing rents in examined communities are coupled with rising home prices. Echoing and extending prior research, we find no significant statistical relationship between home prices and interest rates, overall investor sentiment, and consumer confidence. Another proxy for investor sentiment - consumer fears concerning future job prospects - dominates. The Conference Board of Consumer Confidence Index and the American Association of Individual Investors Bear Index may describe or anticipate house price changes standing alone, but they are not robust factors. Our findings are important to the lender, the homeowner, the real estate investor or developer, and the policymaker.

Keywords: Investor Sentiment, Bubble, Real-Estate, Behavioral Finance

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CHAPTER 1 – INTRODUCTION

Behavioral finance is a relatively new branch of finance that continues to grow at an accelerated pace. Academics and investors alike are becoming more familiar with how emotions affect the way we invest our money. The rational approach is in the process of slowly succumbing to an original approach that considers the irrationality of investors and their emotionally-driven decisions. There are several papers that have successfully demonstrated a correlation between investor mood or psychology and financial market behavior. Behavioral finance takes advantage of psychological theories or explanations to describe seemingly egregious decisions made by investors. The premise behind this paper is to attempt to utilize data collected over a twenty-four year period between 1987 through 2011 to capture the relationship of house prices and investor sentiment on the real estate markets.

This paper examines the proposition that home prices fluctuate in real estate markets that are driven by changes in individual investor sentiment, in part the homebuyer. Movements during twenty-four year duration between 1987 through 2011 may be attributable to movements in homebuyers' sentiment. The collection of investor's sentiment proxies and traditional market variables raises three questions; 1) what is the changing relationship between investor sentiment and house prices relative to the bubble? 2) Does investor sentiment help to describe house prices? 3) Do home prices help to describe sentiment? Answers to those questions will be of interest to homeowners, buyers, sellers, policy makers, urban planners, appraisers and academics professors.

Trying to understand the homeowner and buyer behavior in the real estate market is not as easy calculated or measured as in the stock market. The real estate assets are heterogeneous, and unlike the listed shares of a firm which close substitutes exist, the unique location and other

attributes of real estate assets limit the choice of other substitutes. Furthermore, these heterogeneous assets trade in illiquid, highly segmented and informationally inefficient markets. As a result, researchers who try to explore potential investments are confronted with costly fees, and time consuming inquiries. Therefore, these characteristics create a market that restricts the savvy investor to become an arbitrageur; eliminate mispricing, and controlling for deviations of prices from fundamental values. Instead, the markets characteristics are ultimately compelled by sentimental values.

Many agree that the sentiment of real estate market participants over the past decade may have changed, and we examine proxies for that changing sentiment. Surrogates for investor sentiment can be used to describe the relationship of homebuyers in the housing market to the changes in house prices. These “surrogates” include the Conference Board of Consumer Confidence (CCI), Conference Board of Consumer Confidence index of Jobs Hard to find, American Association of Individual Investors Sentiment Bearish Readings (AAIIB), and The National Association of Home Builders (NAHB). We employ these proxies to describe investors’ impulses on their perception of the economy. We also incorporate macroeconomic variables to understand the aggregate climate of the US economy. This approach is called a “top down” macroeconomic approach which was used by Brown and Cliff (2004), and Baker and Wurgler (2006) when trying to understand investor psychology for stocks. The “top down” macroeconomic factors that we use in our study are: Homeowner Vacancy Rate, Fannie Mae Commitment Rates 30 year Fixed Rate 30 days, US Employment Rate Total in Labor Force Seasonally Adjusted, US CPI Urban Consumers Rent of Primary Residence, S&P/Case-Shiller Composite-20 City Home Price Index MoM, Foreclosures as % of total loans, and Delinquencies

as % of Total Loans. In our tests, we find evidence of changing sentiment among investors when house prices fluctuate, how jobs impact the environment, and changing interest rates.

We briefly review financial theories in the next section. We consider a plethora of research articles on investor psychology in chapter one and define investor sentiment, bubble and speculator. In chapter two, we examine previous research on the real estate market and investor sentiment, in particular the real estate bubble. Then we collect data and summarize the variables that describe investor sentiment and the economy in chapter three. Chapter four revisits the objective of our study, develops a hypothesis question and model. Following, we test our variables in a regression analysis and discuss our empirical results in chapter five. Finally, we concluded with further research pertaining to our study and close our case.

Classical Finance Theory verse Behavioral Finance Theory

Classical finance theory suggests that a price of assets traded in frictionless markets by using the standard present value model indicates that there is no role for investor sentiment. This theory proposes that if mispricing does occur, it is quickly eliminated by the arbitrageurs. However, when dramatic run-ups and subsequent crashes in asset prices occur, such that of the internet “bubble” in the late 1990s and other price anomalies happen, the “behavioral” finance approach to asset valuation according to many research participants state that investor sentiment can have a role in the asset price valuation, in particular the real estate market.

Traditional economists believe in The Efficient Market Hypothesis Theory (EMH). According to this theory, in an efficient market there are investors taking advantage of useful publicly available information to make rational decisions. In a fully rational market, prices would be driven by fundamentals such as income, demographic changes, and national economic

conditions. Investors in such a market would use all information on potential changes in fundamentals to predict future price movements; thus making arbitrage limited and profit opportunities rare. One widely criticized component that the efficient market hypothesis fails to address is the inevitable irrational decision-making process. In fact, notable economist, Professor Robert Shiller at Yale University has stated, “The Efficient Market Hypothesis is one of the most egregious errors in the history of economic thought” (Institutional Investor). Moreover, there has been an abundant amount of research conducted to demonstrate how investor mood and investor emotions play a critical role in the way we perceive risk and reward and gains and losses. Furthermore, we see markets driven by expectations; a new behavioral approach to finance.

Investor Psychology

Many modern researchers agree that it is the continual anomalies existence that eventually introduced finance to the behavioral approach; violating classical and financial theories that assume rational and logical behavior. Behavioral finance is a field of finance that proposes that psychology-based theories to explain market anomalies. Within behavioral finance, it is assumed that the fundamental information combined with the participating market players systematically influence individuals’ investment decisions as well as the market outcome.

One important element that supports behavioral finance is frame dependence. As previously described, as rational human beings, when we are presented with a situation or problem, our perception of that situation determines how we handle it. In other words, we can be presented with the same situation, but if it is explained to us in two different manners, we may arrive at two conflicting solutions. We frame each situation differently, which explains the possibility of arriving at different conclusions. This ability to manipulate certain circumstances can prove to be hazardous in terms of investor’s decisions.

Another component of behavioral finance is a bias that has developed and is driven by heuristics. Heuristics, or rules of thumb, have infiltrated and overwhelmed statistics and finance. For example, overconfidence and aversion to ambiguity are two heuristic elements outlined by David Hirshleifer (2001).

A number of psychological theories exist in a way that they can be applied to ascertain investor sentiment. One of the more common theories is misattribution. This theory states that people assign or originate their feelings from incorrect sources. These frequent feelings from mistaken sources have a tendency to lead to misjudgments. A prime example offered by Hirshleifer(2001) describes how people's attitude and perceptions are more favorable when the weather is pleasant. Furthermore, Hirshleifer names a study performed by Schwarz and Clore that found that people normally rate their life's endeavors more favorably on a sunny day as opposed to a dreary day despite their overall well-being not having changed.

Hirshleifer (2001) maintains that investor mood is also influenced by the amount of available information and the degree of complexity to which the decision requires. When faced with overwhelming amounts of information regarding a particular situation, people tend to develop and employ simple heuristics in arriving at a solution. Normal and rational human beings gravitate towards the more simple approach because it requires less action while still achieving a desired result. Furthermore, a direct correlation between mood and emotional decision-making exists as discovered by psychologist Norbert Schwarz of the University of Michigan. He found that people in pleasant favorable moods are more affected by their emotions. Moreover, people unconsciously make decisions dictated by their mood. For example, a good mood permits people to respond to irrational or worthless information while a bad mood services as a way to dissect and analyze possible misinformation to extract the critical parts of said

information. A number of psychological research studies have concluded that investor mood affects the way investors make decisions, whether they are categorized as rational or irrational at this point is irrelevant, despite many not realizing their mood affects their decisions.

Fascinatingly, people in a more positive mood are more optimistic about their future endeavors and more willing to invest in risky assets (Hirschleifer 2001).

Professor Hirshleifer (2001) outlines objections to the fully rational approach or efficient market hypothesis. Among the objections are: irrational investors will assume more risk and achieve more wealth and precision investing will accumulate through trial and error to avoid poor and questionable decisions. Moreover, Hirshleifer (2001) references an idea called narrow framing where problems are examined in seclusion especially when resources are in a limited capacity.

Investors measure their expected value of wealth by the probabilities of two unique payoffs when encountered by a gamble. However, they normally make their decision on the expected utility of wealth. This utility of wealth measure's an investor's happiness in respect to which payoff he tries to gain during a gamble. Traditional utility theory states that the participant will assess the current gamble by involving previous risks the participant encountered. After comparing it to earlier risks, the participant will decide if the gamble is appealing enough to take on. Conversely, narrow framing occurs when a new gamble is presented but preceding risks are not taken into consideration. This new gamble and the risk it contains is isolated from other risks. Narrow framing can lead to investor error and irrational decision-making. Hirshleifer (2001) continues with another idea called mental accounting. It is a category of narrow framing where investors mentally follow gains and losses in relation to decisions they have made. When it is convenient for them, the previous gains and losses will be released from mental accounts and

only analyzed in a relevant situation. Hirshleifer (2001) states that mental accounting could explain the disposition effect. This unusual psychological theory states that an investor will likely refuse to sell winners and feverishly hold onto instruments that have dramatically declined in value. Taking mental notes of gains and losses allows satisfying or unsatisfying feelings to surface, which can provide inspiration for extreme profitable decisions. A common problem with this theory arises when someone fails to recognize losses. Self-deception theory explains this failure to recognize losses by illustrating how a loss is a poor result of a bad decision. However, someone who deceives themselves will preserve their confidence in decision-making by simply ignoring the loss; otherwise called regret avoidance.

As mentioned above, the Efficient Market Hypothesis (EMH) is when the price of holding an asset accurately reflects all public knowledge of it at any given moment; however this theory does not explain bubbles, crashes or investor sentiment. The EMH instead deposits bubbles and crashes under the term “anomalies.” Rather than being anomalies, bubbles and crises, many researches like Mohacsy and Lefer (2007) conquer

“that they are the rule in economics. They result from collective reaction and instinct.”

Mohacsy and Lefer (2007) explain representativeness as crowds experiencing collective optimism, causing bubbles; which is followed by collective pessimism, causing crashes. In other words, it is human nature to experience these emotions and want to belong to a group. Similarly, Hirshleifer (2001) articulates representativeness heuristic, as individuals claiming to be rational investors, but by their actions they react collectively, buying high and selling low in crowds. A side effect of representativeness heuristic can cause trend chasing, because irrational people perceive random events as reflecting a systematic pattern. A rational investor should track a

trend long enough to make fair judgment whether the trend is fueled by systematic factors or by random clustering and then make a purchase. Otherwise, during optimistic periods, market prices soar as crowds are willing to pay anything. For example, the internet stock market crash.

“The online auction site eBay’s first day of trading started at \$18 and soared to \$241.25 within two months. The stock of search engine Yahoo surged 153% on its first day. In pessimistic periods, market prices crash as crowds feel unwilling to buy, no matter how cheap.”

Hence, it is crowds that cause financial bubbles, and crowds that cause financial crises.

More research advocates such as Griffin and Tversky (1992) along with Barberis, Shleifer, and Vishny (1998) attempt to reconcile representativeness in which people update their beliefs based on the ‘strength’ and the ‘weight’ of new evidence. In other words, representativeness heuristic can impair one’s judgment by allocating too much or too little attention on the pertinent information.

Barberis, Shleifer and Vishney (1998) create a model to illustrate how investors might form beliefs that lead to both underreaction and overreaction to information. They propose that in making forecasts, people pay too much attention to the strength of the evidence they are presented with and too little attention to its statistical weight. The models specifications are built on the psychological evidence documented by psychologists: conservatism and representativeness heuristic. Conservatism states that individuals are slow to change their beliefs in the face of new evidence (Edwards, 1968). When evidence of corporate earnings announcements is released it is considered to be low strength and high significant statistical weight. The assumption gives way that the stock prices underreact to earnings announcements

and similar events, in part due to conservatism. Representative description is measured in the study by consistent patterns of news, such as series of good earnings announcements, representing high strength and low weight information. This measure assumes that stock prices overreact to consistent patterns of good or bad news, in part due to representativeness. In the end, the theory predicts that, holding the weight of information constant, one-time strong news events should generate an overreaction by the investor. Thus, indicating that individual sentiment and irrationality is innately filtering the market, continuing to challenge the classical market theory.

Whether one is tracking or chasing trends; overreacting or underreacting to information, Graham articulates, “Investors worst enemy is himself” (Graham 2003). Instead of technical or fundamental rules influencing the market, the rules are adapted by collective reaction and instinct. In the words of Mohacsy and Lefer (2007) the market is a “conglomeration of human sentiment,” therefore, fundamental, technical figures, and collective sentiment all contribute to the mechanics of bubbles, crashes, and asset valuations. Daniel Kahneman, a notable Nobel Prize winner in Economics 2002 and in 2011 Bloomberg recognized him as one of 50 most influential people in global finance; suggests that markets ups and down may be due to “investors’ illusions of control.” In other words, people fail to recognize the important factor(s) because they look to one another for signs of happiness, thinking they are controlling the decision and outcome. Comparably, during the real estate bubble; individuals were leveraging more than they could afford to purchase a house. Meanwhile, withstanding the fact that the investment was not affordable and realistic, they disregarded their own financial statements and joined the crowd.

Bubble

From a psychological perspective, thus far, we have illustrated how human behavior affects individuals' investment decisions. The years between 1997 through the peak August 2006 is when home prices inflated and the real estate market escalated, creating an enormous bubble, and then busted. First, let's define an asset price bubble. According to Kroszner, cited by Belke and Wiedmann (2005), an asset price bubble "represents a mispricing of asset values by the market." Another definition elaborates that with a bubble; prices increase faster and are higher than can be explained by market fundamentals. For example, home prices had increased by 24.6 percent through 1/2000. The S&P/Case-Shiller index increased at a swelling rate; 23.9 percent from 1/2000 to 1/2002, 31.4 percent from 1/2002 to 1/2004, and 36.6 percent from 1/2004 to 1/2006. The peak of the index of 226.29 was reached in 6/2006; an outrageous increase of 182.0 percent from June 1997 (McDonald and Stokes 2011). See Figure 2. Level and First difference data for Home Price Index. Subsequently, a bubble occurs when people purchase an asset solely because they believe that the asset will be priced higher tomorrow; attracting speculators interested in profits rather than revenue. Once an asset is bought strictly for the purpose of reselling it to someone else for a higher price, the market is confronted with speculation and loses contact with its fundamentally reasonable levels. Many studies report the existence of price bubbles, suggesting that the occurrence of trends in house prices lack fundamental economic rationale.

Speculator

What is a speculator? A speculator is typically a sophisticated risk-taking investor with expertise in the market(s) in which one is trading and will usually use highly leveraged investments. Speculators take large risks, especially with respect to anticipating future price movements, in the hope of making quick, large gains. Although in our study we do not try to calculate the number of speculators in the market, we do try to understand the characteristics of a speculator and its role in the formation of the real estate bubble, and equally builds on the notion (paradigm) of the behavioral approach theory in finance; which ultimately influences investors' sentiment. A speculator in general is hard to quantify, and trying to measure speculators influencing the residential housing market adds another challenging element to movements of house prices because single-family housing segment is viewed as both an investment and consumption good. (Gatzlaff and Tirtiroglu 1995).

Sentiment

Market sentiment or interchangeably investor sentiment is defined as; the feeling or tone of a market (i.e. crowd psychology). It is characterized by the activity and price movement of securities, the risk and return an investor is willing to take on. This type of behavior is demonstrated by rising prices, indicating a bullish sentiment market and falling prices, indicating a bearish sentiment market. Mohacsy and Lefer (2007) reference another Nobel Prize winner of 2004, Prescott and Kydland, who theorize that new technology causes markets booms and busts. Interestingly, all bubbles begin with new innovated technology that creates new opportunities. For instance, securitization, derivatives, auction-rate securities, credit default swaps, were new tools in 2000s for the financial sector to create a more liquid, global and efficient market for risk.

Therefore, new technology turns people into speculators, because without speculators taking on risk to promote new ideas, then the new innovative tool would never exist. Said differently, speculation drives prices excessively upward, illustrated by the

“¹existing single-family home sales increased by 22.4% between the end of 2001 and March 2004, indicating an increasing turnover by speculators.”

¹ National Association of Realtors: Existing Single Family Homes Sales, Current Release June 2004, in: <http://www.realtor.org/research.nst/pages/EHSdata> [08.08.2004],p.1.

CHAPTER 2- REAL ESTATE LITERATURE REVIEW

In the first chapter, we try to educate the reader how investor psychology, behavior and finance are woven together. In chapter two, we expand on the idea but specifically focus on the niche real estate market; single-family homes. Clayton, Ling and Naranjo (2008) examine the relative influence of fundamentals and investor sentiment by exploring the variation of property-specific national-level capitalization rates. The primary data source is the Real Estate Research Corporation (RERC) which is known for its research, analysis, and investment criteria. The RERC's Real Estate Report, publishes results from the RERC's quarterly Real Estate Investment Survey. Survey respondents are asked to rank the "investment conditions" of nine property types: apartment, hotel, industrial research and development, industrial warehouse, central business district (CBD) office, suburban office, neighborhood retail, power shopping centers, and regional malls. The sample participants (institutional investors and managers) rank the nine property types on a scale of 1 to 10, with 1 representing "poor" investment conditions and 10 indicating "excellent" conditions for investing. These rankings of investment conditions directly measure investor sentiment. In the study, RERC cap rate survey and RERC expected rental growth rates survey are proxies of investor sentiment.

RERC cap rates and RERC expected rent growth for apartments, CBD offices, and retail-malls between 1996 through 2002 display a negative correlation between. Between the years 2002 through 2007 cap rates and expected rental growth start to move together, demonstrating a positive correlation. This movement assumes that the decline in cap rates was sentiment driven by irrational investors expecting increase rental income.

The results demonstrate that sentiment does not appear to affect the variation in rental growth rates. However, the decrease in capitalization rates over the periods 2002 through 2006 is

an increase cash outflow that could reflect investor sentiment. In other words, the reduction in capitalization rates that occurred can be largely attributed to the available liquidity or sentiment-driven cash flows that impacted the market over the past 5-to-6 years.

Case and Shiller (1988) found in their 1988 house price movements survey that interest rates are a dominant factor in the decision-making process preceding the purchase of a home. According to Case and Shiller, and our statistical results, we provide enough evidence that house prices do not depend on interest rates. These papers provide useful empirical characterization of the dynamic real estate crisis, capital flow and pricing, and therefore provide a solid foundation on which additional research can build.

Consumer Confidence Index

According to a recent study done by Garret, Hernandez-Murillo and Owyang (2005), they uncover a significant relationship between consumer sentiment and retail sales growth on a micro-level, for individual states. Retail sales growth is a measure of state-level personal consumption expenditure, dependent variable. They compute retail sales, for all states, by dividing state sales tax collection by the state sales tax rate, representing a state series index and a national series index. The independent variables are The University of Michigan's Index of Consumer Sentiment (ICS) and the Conference Board's Consumer Confidence Index (CCI).

The national retail sales models are split into groups by national ICS, national ICS with additional variables, regional ICS, regional ICS with additional variables, national CCI, and national CCI with additional variables.

National ICS predicts retail sales growth in about 39 percent of the states, when no additional variables are included or significant in 17 of the 44 sample states. The percentage of explained variation in retail sales growth, adjusted R^2 , for the states with significant

relationships, reveals an average of 2.8 percent using the national ICS and an average of 4.6 percent using the regional ICS. When additional control variables are included, the ICS predicts retail sales growth in about 43 percent of the sample states or significant in 19 of the 44 sample states. The model's adjusted R^2 measures variation for the states with significant relationships, describing on average an increase for the national ICS to 4.6 percent and an average of 3.7 percent regional ICS decrease, when introducing new variables.

The CCI predicts retail sales growth in about 27 percent of the sample states, with no additional control variables or significant in 12 of the 44 sample states. The percentage of explained variation in retail sales growth, adjusted R^2 , for states with significant relationships, reveals an average of 3.5 percent using the national CCI. When additional control variables are included, the CCI predicts retail sales growth in about 43 percent of the sample states or significant in 19 of the 44 sample states. Although the predicted retail sales growth is about 43 percent significant for both sentiment indices, ICS and CCI, the percentage of explained variation in retail sales growth, adjusted R^2 , for the states with significant relationships, unfolds that the national CCI averages 4.3 percent increase variation. In other words, the CCI has stronger predictive power over the ICS, when additional control variables are included in the model and measured by the adjusted R^2 .

The findings of Garrett, Hernandez-Murillo, and Owyang (2005) reveal that, the results suggest that consumer sentiment measures are relatively poor predictors of state-level retail sales growth. However, predictive power of CCI is robust in the national regression when additional explanatory variables are included. Therefore, consumer sentiment may help the general economy from a macroeconomic approach, but may be less significant in forecasting regional economic growth. This article is informative for our macroeconomic real estate study because trying to find

a relationship between investor sentiment and house price is limited not only on both a micro and macro approach but restricted also from a behavioral methodology. Therefore we assume by including the CCI as an independent variable is a worthy representation of consumer sentiment on an aggregate level. In our study, the CCI contributes no evidence to the house prices, foreclosures, and delinquency index models. Although the CCI fails to reject the null hypothesis in the three models, CCI is significant for the National Association of Home Builders Model, at the .01 level and CCI Jobs Hard to get is significant to house prices. Contrary to Garrett, Hernandez-Murill, and Owyang (2005), the articles associated with house pricing from a micro-level and regional area, have more influential factors on home prices, than variables from a macro approach.

CHAPTER 3 – DATA COLLECTION AND SUMMARY STATISTICS

In the beginning, we started with thirty-one prospect variables. The first elimination method was based on insufficient data. For example, our study start in the year of 1987, so any indices that did not provide data close to that year was removed. Therefore, Office Building Index started on March 31, 2001; so we eliminated the variable. Bloomberg Put/Call Ratio, CBOE Put/Call, S&P500 Put/Call, US Home Sold Annual MoM, City Home Price MoM, State Street Investor Confidence, State Street Investor Confidence North America, Investor intelligence Sentiment Bulls, and Subprime Delinquencies % of total Loans all were terminated due to a lack of sufficient years. The second elimination method was confirmed after the aggregate correlation analysis. The correlation matrix assumes that Gold Commodity, Silver Commodity, LIBOR 3months, and American Association of Investor Bulls, all find no systematic relationship or zero correlation so these variables were also erased from the data set. In addition to the elimination process, the VIX index, Mortgage Bankers Association Refinancing Index, CPI YoY, and CPI MoM were also ruled out of the data set, due to zero correlation. In this process, we do not provide further analysis on why these variables assume zero correlation.

After the filters where applied, the remaining variables we use in our study are: S&P/Case-Shiller Composite-20 City Home Price Index, Homeowner Vacancy Rate, US CPI Urban Housing Rent, Fannie Mae 30Y Fixed Rate, National Association of Home Builders (NAHB), Conference Board of Consumer Confidence Index (CCI), Conference Board Consumer Confidence Jobs hard to find, American Association of Individual Investor Bears, Foreclosure, Delinquencies as % of total loans, and Unemployment Seasonally. These variables provide adequate sample length, frequency and proper correlation.

The group of independent variables (explanatory variables) can be divided into two groups. The first group is a proxy for investor sentiment; Conference Board Consumer Confidence Jobs hard to find, Conference Board Consumer Confidence (CCI), and American Association of Individual Investor Bear Readings. The second group can be considered macroeconomic variables: US Unemployment, Homeowner Vacancy Rate, Fannie Mae 30Y Fixed Rate, and US CPI Urban Housing Rent. The dependent variables (outcome variables) are also divided into two groups; same as above - proxy for investor sentiment and macroeconomic variables. The dependent variable, National Association of Home Builders, is used to describe investors' sentiment with other sentimental factors and/ or economic fundamental variables. Foreclosures, Delinquencies as a % of total loans, and Home Price Indices, are dependent variables that assume to describe a relationship with investors' sentiment and economic fundamentals. Table 1 and 2 show all the variables with their description, source, and type.

We use monthly data over the period 1987:Q2 to 2011:Q2 for the analysis, focusing on aggregate house pricing, investor sentiment and market fundamentals. The sample data on the various components of investor sentiment and market fundamentals are collected from the U.S Bureau Census, and various indices all which are gathered from Bloomberg's database.

Correlation Statistics

Correlation is a statistical measure of how two variables tend to move together, a measure of association, describing the strength and direction of the relationship between two variables. Correlation closer to one means a strong relationship moving together. Closer to negative one means the variables tend to move in opposite directions.

House pricing has high positive correlation with Homeowner Vacancy Rate (.70) and US CPI Urban Housing Rent (.86). House pricing and US unemployment have no systematic

relationship. A high negative correlation with interest rates (-0.71) Fannie Mae 30Y fixed rates and the other variables indication low negative correlations.

Foreclosures are directly related with Delinquencies (.97), Unemployment (.76), and Homeowner Vacancy rate (.74), and US CPI Urban Housing Rent (.71). There is an inverse relationship with NAHB (-0.7), interest rates (-0.65), and Consumer Confidence (-0.58).

Delinquencies are positive related with Foreclosure (0.97), Unemployment (0.78), and Homeowner Vacancy Rate (0.75). Delinquencies have an inverse relationship with interest rates, NAHB, and Conference Board Consumer Confidence (CCI).

National Association of Home Builders (NAHB) is positively correlated with Consumer Confidence (0.64) and negatively correlated with Homeowner Vacancy Rate (-0.77), Delinquencies (-0.76), Foreclosures (-0.70), and Unemployment (-0.60).

Consumer Confidence (CCI) is positive correlated with NAHB (0.64) and an inverse relationship with CCI jobs are to get (-0.92) and (-0.82) with Unemployment. All the other variables show low negative correlations.

CCI Jobs Hard to get has one high positive correlation of unemployment (0.93) and followed by low positive correlations. CCI jobs hard to get is highly correlated in the opposite direction with CCI (-0.92).

American Association of Individual Investor Bearish Readings (AAIIB) displays no high positive correlations. It mostly describes a low positive correlation ranging from 0.21 to 0.42, and a negative relationship with interest rates, NAHB, and CCI.

Homeowner Vacancy Rate has a direct relationship with US CPI Urban Housing Rent (.81), Delinquencies (.75), Foreclosure (.74) and House Pricing (.71). The inverse relationship is also related with interest rates (-0.59) Fannie Mae 30Y fixed rates.

US Unemployment Rate is positive related with CCI Jobs hard to get (.93), Delinquencies (.78) and Foreclosures (.76). A highly negative correlation with CCI (-0.82), and NAHB (-0.60). Then followed by a low negative correlation with interest rates (-0.37) Fannie Mae 30Y fixed rates.

US CPI Urban Housing Rent is positive correlated with House Pricing (.86), Homeowner Vacancy Rate (.81), and Foreclosures (.71). Housing rent is negative correlated with interest rates (-0.91).

The surrogates for investor sentiment: NAHB, CCI, CCI Jobs hard to get, and AAIIB, demonstrate interesting relationships. NAHB is positive correlated with CCI at the 0.64 level. CCI Jobs hard to get negatively correlated with CCI (-0.92) and NAHB (-0.55). AAIIB shows no high positive correlation with the others but rather low correlation and negative correlation with NAHB, and CCI. Refer to Table 3. for the correlation matrix.

Descriptive Statistics

Measures of average are also called measures of central tendency and include the mean, the median, and the mode. When the mean, median and mode are compared together, the measured sample population creates a distribution shape. The distribution values create shapes that tell a story. Standard normal distribution is when the mean, mode and median are equal, creating a bell-shaped curve. When the mean is greater the median the distribution is said to be “right skewered,” or positively skewed distribution because the extreme scores at the tail of the

distribution have increased the value of the mean. This is true for House Price, Unemployment, Homeowner vacancy rate, Foreclosures, Delinquencies, Fannie Mae interest rates, CCI Jobs hard to find, and US CPI Urban Housing Rent. When the mean is less than the median it is said to be “left skewed,” or negatively skewed distribution because with extreme scores are at the lower end of the distribution, skewing the measures of central tendency in opposite order. The mean is lower than the median for NAHB (48.44/53), CCI (94.96/100.20). Interestingly, the AAIIB (30.50/30) distribution is arranged as mean 30.50, median at 30.0 and mode at 20.0, a close distribution which can be considered as an uniform shape. Refer to Table 4 and 5 for a full view of the descriptive statistics.

The measures that determine the spread of the data values are called measures of variation or measures of dispersion. These measures include the range, variance, and standard deviation. Range is the measure of variability and is the difference between the lowest and highest, or minimum and maximum units. The min and max from the mean indicate a narrow spread or range. When extreme high or extreme low data values are in the data set, they are called outliers; which can affect the mean of the data set. The variance and standard deviations can be used to determine the spread of the data. If the variance or standard deviation is large, the data is more dispersed. Their measurements are useful to determine the consistency of a variable, and to determine the number of data values that fall within a specified interval in a distribution.

CHAPTER 4 –RESEARCH OBJECTIVE, HYPOTHESIS QUESTION & MODEL

The main goal is to discover whether investor sentiment helps to describe house prices, and whether house prices help to describe investor sentiment. Home prices and sentiment are related one another, and a number of macroeconomic variables have influence on these factors, as well.

The Null hypothesis:

Macroeconomic variables and proxies for investor sentiment do not describe home pricing.

Similarly:

What macroeconomic variables and proxies for investor sentiment describe home pricing?

Do home prices help to describe sentiment?

The collected data stated above is displayed in Table 1 and 2, which starts in August 1987 because that's when the S&P/Case-Shiller Composite-20 City Home Price Index started to record monthly data. Our study assembles data from August 1987 until June 2011. Some data was unavailable monthly, and then it was collected quarterly. In the case of quarterly data, like US Unemployment, Homeowner Vacancy Rate, Foreclosures, and Delinquencies as a % of total loans, they were evenly distributed by the smoothing technique. Although we do not test for unit roots in our study, the first four regression analysis revealed that most of the dependent variables may have a unit root, causing the models to appear "perfect." Therefore, instead of using the actual level series of all variables, we first difference each of the time series. The level line graphs and first difference line graphs are illustrated from Figure 2 through Figure 12; to clarify the non-stationary and stationary values.

The empirical model assumes that the dependent variable(s) (House Pricing, Foreclosures, Delinquencies, and NAHB) depends on both macroeconomic variables and proxies for investor sentiment. The described relationships above are analyzed by Ordinary Least Square (OLS) regression model. The OLS analysis will reveal the most significant independent variables on House Pricing, Foreclosures, Delinquencies and NAHB. Although, we stop and analyze the results from the first regression model, we realize for further studies, the next procedure to refit the model would be to base the models with the significant variables, and eliminate the variables that do not contribute to the model.

CHAPTER 5 – REGRESSION ANALYSIS AND RESULTS

For all four of the regression models, we set the alpha to 0.10, and beta equals zero, so if the P-value is greater than 0.1 we do not reject the null hypothesis, because there is not enough evidence to reject the claim. In other words, we fail to reject the null hypothesis. If the P-value is less than 0.1 we reject the null hypothesis, concluding there is enough evidence to reject the claim.

The first regression model tries to describe the relationship of house prices on ten different economic variables and proxies for investor sentiment. For example, The National Association of Home Builders' (NAHB) P-value equals 0.251695, thus the P-value is greater than alpha, and is not in the rejection region so we fail to reject the null hypothesis because it is not significant at the .10 level. Surprisingly, three out of the four independent investor sentiment proxies do not help to describe house pricing. These include: NAHB, CCI, and AAIIB; excluding CCI jobs hard to get. When people are worried about the current job market, and jobs are hard to get, CCI jobs hard to get index indicates a negative significant relationship with house prices. In other words, when house prices are low, consumer fears increase concerning jobs prospects. Contrary to many beliefs, that interest rates effect house prices, Fannie Mae 30 year fixed rate, fails to reject the null hypothesis, not significant at the .1 level. Interest rates is negatively correlated with house prices. We believe that higher interest rates are associated with stronger employment and income growth. This could be due to the fact that when interest rates are low, the economy is slugging, and growing at a slower pace. When interest rates are high, the economy is booming and house prices are low. When interest rates increase or decrease, the Federal Reserve intervenes and tries to stabilize the economy. Belke and Wiedmann (2005)

allocate mortgage rates as a major determinant of increasing real estate prices between the years 1975 through 2003. Correlation does not cause causation and gathered from our results; interest rates do not provide significant evidence to influence house prices. Negative correlation and failure to reject the null hypothesis is also associated with CCI. Therefore house prices do not depend on NAHB, CCI, AAIB, and the homeowner's vacant rate or interest rates.

Conversely, the remaining results indicate the US Unemployment rates, foreclosures, delinquencies as % of total loans, CCI jobs hard to find and US CPI Urban housing rent independent variables play a significant role in home prices. In other words, the results suggest a relationship between house prices on five of the ten variables selected in this regression model. Unemployment has significance and negative correlation influencing the y variable. When unemployment is low, house prices are high. When individuals have job security, they have an opportunity to invest their income in assets such as the real estate home market. The unemployment rate fell dramatically between 1996 through early 2001.

Foreclosures, delinquencies as % of total loans, and CCI jobs hard to get are all independent variables that help describe house prices with an inverse relationship. Overall, when unemployment rates increase, there is a domino effect; homeowners are without a job, so delinquent loans increase, then foreclosures increase, and naturally house prices decrease. The one proxy for investor sentiment that describes house prices is CCI jobs hard to get. When consumer fears increase circulating around the job market, individuals are not going to take on more risk or purchase a home; instead they will decrease risky investments until the job market generates opportunity.

Regression models Table 7 and 8, represent regressions for the fundamental real estate dependent variables; Foreclosures, and Delinquencies as a % of total loans. The overall fit of the Foreclosure model, identifies the highest R square out of the four models; 37 percent. Thus, 37 percent of the variation of foreclosures is accounted for by the variations in the independent variables. Out of the ten independent variables, only three reject the null hypothesis. In other words, house pricing, delinquencies, and urban home rent all provide significant evidence on foreclosure activity. House price index has a negative correlation with foreclosures, whereas delinquencies and rental income have a positive correlation. Our regressors discover that when foreclosures increase, house prices decrease and home rents increase. According to Belke and Weidmann (2005), they agree that the increase in foreclosures could initiate lower prices because foreclosure risk could be associated with the increase of sub-prime loans that were promoted by the expansion of the Government Sponsored Enterprises (Fannie Mae and Freddie Mac). This expansion started in 1997, welcoming low-income individuals a chance to purchase a home, possibly pushing up house prices, increasing return and risk. If risk increases because homeowners fail to pay on their loans, then an increase in foreclosures could force homeowners to sell, thereby decreasing home values, and subsequently increasing rent in the rental market.

These variables: NAHB, Unemployment, homeowner vacancy rate, Fannie Mae fixed interest rates, CCI, AAIIB, and CCI Jobs hard to get, fail to reject the null hypothesis, there is not a statistically different difference. Although interest rates are not significant, the negative correlation to foreclosures is an interesting result. Said differently; when foreclosures increase, interest rates decline; possibly due to banks loosening lending requirements to increase consumption in the economy and stimulate growth.

The Delinquencies as % of total loans regression model is closely related to the foreclosure model. The results displayed in Table 8, provide similar results to Table 7, but includes two different significant variables. The overall fit for this model suggests that 23 percent of the dependent variable- Delinquencies- is accounted for by the variations in the independent variables. There is 77 percent variation in foreclosures that is not due to variations in the independent variables. The significant variables with a p-value less than 0.1 include: foreclosures, house pricing, unemployment rate, and homeowner vacancy rate rejecting the null hypothesis and contributing to the model. House pricing has a negative correlation with delinquencies and foreclosures. Subsequently, when foreclosures and delinquencies rise, house prices depreciate; a verdict that was assumed before the study and confirmed on house pricing, foreclosures, and now delinquent regression models. Although unemployment rates were not significant on foreclosures, they are significant with delinquent loans. More than likely, when unemployment rates increase and people lose their jobs, it increases the possibility of missing payments up to 30 and 60, or 90 days but recover payments before the risk of foreclosure. What is noteworthy from Table 6 through Table 8 is the highly significant association between house prices, delinquencies and foreclosures. The variable that does not help to describe foreclosures is unemployment rates; although it was significant in the other regressions, and not significant for this model, leads us to believe that individuals can still have a job but not afford their home, ultimately representing that the home was too expensive to begin with and ends in foreclosure, deflating the value of the house. The last positive correlation indicating significance is homeowner vacancy rates relative to delinquencies. When the numbers of vacant homes decrease (increase), delinquencies also decrease (increase). When foreclosures, vacant homes, and

unemployment decrease (increase), the delinquency rate decreases (increase). The real estate house prices increase (decrease), relates to a decrease (increase) for delinquent movement.

National Association of Home Builders (NAHB) is the last regression model located on Table 9. The NAHB is a function of investor sentiment and national fundamentals. About 16 percent of the NAHB's variation is based on variations by the independent factors. Although the overall fit of the models measured by R square is weaker in this model compared to the previous models, we are confident that there is an effect and we have a reasonable estimate of that effect, by rejecting the null hypothesis for Fannie Mae fixed rates; we are significant at the .01 level. Fannie Mae interest rate finally plays a positive correlated role for describing investor sentiment, in part the Home Builders Association. The building association's outlook is influenced by current interest rates. This result is consistent by Case & Shiller (1988) survey, mentioned in the previous chapter. When the economy is prospering, interest rates increase, and the NAHB are optimistic. The US CPI Urban housing rent has a negative correlation, and is significant at the .05 level. The consumer confidence index is highly significant indicating that when consumers have an optimistic outlook on the current and future economy they are more willing to spend on goods and services. CCI jobs hard to get is the other sentiment proxy that is significant at the .1 level.

The variables that fail to reject the null hypothesis are: delinquencies as a % of total loans, foreclosures, house pricing, unemployment, AAIIB and homeowner vacancy rate. They are not significant at the .10 level. The combinations of the variables that do not contribute to NAHB, conclude that some market sentiment surrogates and select fundamentals may not be important enough to influence the investors current or future view of the economy. The important benchmark not only for The National Association of Home Builders, but for

homeowners, investors, appraisers, and policy makers is that interest rates can change or influence one's outlook and purchasing power. We conclude that most people debate that house prices are dependent on interest rates, but according to our study they are not significant. However, our beliefs, that people think house prices are dependent on interest rates, could be correct because according to our results; interest rates provide evidence to influence the NAHBs. Human behavior is contingent upon the current interest rates. According to McDonald and Stokes (2011) who investigates the relationship between monetary policy and the housing bubble, suggest that if the interest rates were artificially implemented by the monetary authorities, the economy will be confused because "a decline in the interest rate promotes an increase in investment projects, but also induces the public to save," They find that the Federal Reserve lowering interest rate and holding it down in the period 2001-2004 significantly helped cause the housing bubble, however it does not explain the hypothesis; that the decrease federal funds rate caused housing prices to increase. In the end, the findings are consistent with our results; that interest rates are negatively related to housing price series. Although in our study we do not try to prove whether or not the bubble existed, it should be noted that changes in the mortgage market contributed to the bubble because of loose credit standards, increase securitization, and lax regulations- just to name a few causes in the financial sector that changed the sentiment of the market, homebuyer and investor.

CHAPTER 6 – CONCLUSION

This paper investigates the role of fundamentals and investor sentiment on house prices in the residential real estate market, as well as trying to describe a relationship with home prices and market sentiment. Our results examine time-series data collected between 1987 through 2011 with the maximum aggregate variables to help understand the dynamic of home prices from a macroeconomic valuation and behavioral perspective. The real estate market is inefficient because it's regarded as being highly segmented, illiquid, and heterogeneous. Therefore it is difficult for investors to identify opportunities, which could correct any mispricing. These characteristics make research inconsistent, costly and scarce. Trying to measure not only the fundamentals is costly and time consuming but trying to understand the behavioral process of purchasing a home is difficult when the asset is negotiated, rather than auctioned or exposed to the general public. The notion of owning a home is the "American dream," and it has been innate in the American culture embedded with my emotions. Our results provide evidence that house prices are dependent on unemployment rates, and consumers' uncertainties around job security. We also discover that foreclosures and house prices are negatively correlated and significant at the .01 level. These findings are important to homeowners, buyers, sellers, investors because a property can deviate from the fair market value, and understanding the direction of the real estate market can impact one's wealth.

Further Research

To get a closer abstract view of the real estate market sentiment and how investor psychology influences purchases, additional sentiment proxies such as: days on the market, bid/ask spread, and different types of mortgage loans can all help to describe how much risk

investors are willing to incur in the climate of the economy. It also helps to measure speculators in the real estate market, which is hard to distinguish. Finding these variables are timely and costly, so we would suggest that the researcher follow a microeconomic approach and collect data for a specified location or zip code.

Additional research could try to exploit an aggregate model on house pricing between the same years as our study 1987 through 2011 and then conduct various models specifically before, during and after the real estate bubble. This would capture price movements and changing investor sentiment at specific phases of the economy.

TABLES

Table 1. Dependant Variables. Abbreviation, Description and Source

Abbreviation	Variable Description	Source
Y	S&P/Case-Shiller Composite-20 City Home Price Index MoM.	Bloomberg and S&P
Y	National Association of Home Builders	Bloomberg
Y	Foreclosures as % of total loans	Bloomberg
Y	Delinquencies as % of total loans	Bloomberg

Table 2. Independent Variables, Abbreviation, Description, Source, Type

Abbreviation	Variable Description	Source	Type
SPCS20M%	S&P/Case-Shiller Home Price Index. The price index of price changes with in 20 metropolitan markets. Home price index reflects price changes in Boston, Chicago, Denver, LA, Las Vegas, Miami, NY, San Diego, SF, Washington D.C., Atlanta, Charlotte, Cleveland, Dallas, Detroit, Minneapolis, Phoenix, Portland, Seattle, and Tampa. Purpose is to measure the average change in single-family home prices in a particular geographic market. To be included in the home price indices, a house must be a single-family dwelling; excluding condominiums, and new construction.	S&P/Case-Shiller Composite -20 City Home Price Index MoM	National
DLQTFORE	Foreclosures as a % of total loans. Survey does include REO's.	Bloomberg	National
USHBMIDX	National Association of Home Builders Index. A housing market index which measures building industry sentiment and outlook, the real estate index measures buyers' and sellers' current attitudes, as well as their expectations for the future.	Bloomberg NAHB-Wells Fargo (HMI)	National
DTQTDLQT	Delinquencies as % of total loans. Survey does not include REO's. Figures shown as a percent of total numbers of residential loans outstanding. Delinquencies are the total of 30, 60, and 90-day past due. This index does not include foreclosures.	Bloomberg	National

Table 2 cont.

CONCCONF	Conference Board Consumer Confidence Index (CCI). Is a barometer of the health of the U.S. economy from the perspective of the consumer. The index is based on consumers' perceptions of current business and employment conditions, as well as their expectations for six months hence regarding business conditions, employment, and income. An economic benchmark indicator available each month.	Bloomberg	National
CONCJOBH	Conference Board Consumer Confidence Jobs hard to get Index.	Bloomberg	National
HVRAHOME	Homeowner vacancy rate index. The homeowner vacancy rate is the proportion of the homeowner inventory which is vacant for sale. Subject to one-quarter lag. Quarterly.	Bloomberg US Census Bureau	National
FNCR3030	Fannie Mae Commitment Rates 30 year fixed rate 30 days. These rates reflect the Fannie Mae required net yields for a 30 year fixed mortgage rate.	Fannie Mae Bloomberg	National
USURTOT	US Employment rate total in labor force seasonally adjusted. Measures the US unemployment rate on a monthly basis. The unemployment rate represents the number unemployed persons as a percent of the labor force. Each month approximately 60,000 sample households are interviewed (a portion is done via telephone) during the week that includes the 12 th of the month.	Bloomberg US Census Bureau	National
CPSHRPR	US CPI Urban Consumers Rent of Primary Residence Index. How much consumers are paying for rent.	Bloomberg Bureau of Labor Statistics	National
AAIBEAR	American Association of Individual Investors Sentiment Bearish Readings Index. This indices reflects the sentiment of individual investors towards the stock market over the next 6months. The question asked is "I feel that the direction of the stock market over the next 6months will be?" Polls indicate the bullishness and bearishness of the stock market.	Bloomberg	National

Table 3. The Correlation Matrix

	Composite-20	US Unemp. Season adj.	Homeowner vacancy rate	Foreclosure	Delinquencies as % of total loans	Fannie Mae 30Y Fixed rate	NAHB	CCI	American Association of indiv. Invest. Bear	CCI Jobs hard to get	US CPI Urban housing rent
Composite-20	1										
US Unemp. Season adj.	0.00	1									
Homeowner vacancy rate	0.71	0.35	1								
Foreclosure	0.36	0.76	0.74	1							
Delinquencies as % of total loans	0.34	0.78	0.75	0.97	1						
Fannie Mae 30Y Fixed rate	-0.71	-0.37	-0.60	-0.64	-0.56	1					
NAHB	-0.26	-0.60	-0.77	-0.70	-0.76	0.24	1				
CCI	-0.18	-0.82	-0.43	-0.58	-0.62	0.42	0.64	1			
Amer. Ass. of indiv. Invest. Bear	0.31	0.21	0.42	0.30	0.33	-0.19	-0.46	-0.38	1		
CCI Jobs hard to get	0.03	0.93	0.30	0.58	0.61	-0.33	-0.55	-0.92	0.23	1	
US CPI Urban housing rent	0.86	0.28	0.81	0.71	0.65	-0.90	-0.43	-0.35	0.31	0.22	1

Table 4. Descriptive Statistics

	House Price Composite-20	US Unemp. Season adj.	Homeowner vacancy rate	Foreclosure	Delinquencies as % of total loans	Fannie Mae 30Y Fixed rate
Mean	115.53	5.87	1.87	1.52	5.16	7.25
Standard Error	2.55	0.09	0.03	0.06	0.09	0.10
Median	95.08	5.50	1.70	1.09	4.68	7.12
Mode	79.91	5.40	1.70	1.04	4.70	7.90
Standard Deviation	43.35	1.48	0.43	1.06	1.48	1.76
Sample Variance	1879.30	2.20	0.19	1.12	2.18	3.09
Kurtosis	-0.82	1.05	-0.03	3.27	3.43	-0.75
Skewness	0.73	1.26	1.20	2.19	2.15	0.22
Range	139.47	6.30	1.50	3.78	6.14	7.35
Minimum	67.12	3.80	1.40	0.86	3.92	3.73
Maximum	206.59	10.10	2.90	4.64	10.06	11.08
Count	288	288	288	288	288	288

Table 5. Descriptive Statistics

	NAHB	CCI	AAIIB	CCI Jobs Hard to get	US CPI Urban Housing Rent
Mean	48.44	94.96	30.50	26.95	184.52
Standard Error	1.07	1.61	0.60	0.63	2.34
Median	53.00	100.20	30.00	24.10	177.40
Mode	55.00	115.70	20.00	22.40	124.60
Standard Deviation	18.19	27.28	10.12	10.62	39.65
Sample Variance	330.76	744.38	102.43	112.79	1571.94
Kurtosis	-0.66	-0.76	-0.31	-0.67	-1.21
Skewness	-0.66	-0.29	0.42	0.56	0.27
Range	70.00	119.40	54.33	39.80	129.68
Minimum	8.00	25.30	6.67	9.60	123.00
Maximum	78.00	144.70	61.00	49.40	252.68
Count	288	288	288	288	288

Table 6. OLS Regression Home Price 1987-2011

<i>Regression Statistics</i>						
Multiple R			0.5878			
R Square			0.3455			
Adjusted R Square			0.3218			
Standard Error			0.0062			
Observations			287			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.0020	0.0009	2.3209	0.0210	0.0003	0.0037
NAHB	0.0055	0.0048	1.1487	0.2517	-0.0039	0.0148
US Unemp. Season adj.	-0.0356	0.0143	-2.4814	0.0137	-0.0638	-0.0074
Homeowner Vacancy Rate	0.0001	0.0199	0.0051	0.9959	-0.0391	0.0393
Foreclosure	-0.1664	0.0199	-8.3621	0.0000	-0.2056	-0.1272
Delinquencies as % of total loans	-0.0459	0.0252	-1.8245	0.0692	-0.0955	0.0036
Fannie Mae 30Y Fixed rate	-0.0022	0.0092	-0.2441	0.8073	-0.0203	0.0159
CCI	-0.0025	0.0051	-0.4868	0.6268	-0.0125	0.0075
AAIIB	0.0011	0.0009	1.1802	0.2389	-0.0007	0.0030
CCI Jobs hard to get	-0.0119	0.0065	-1.8392	0.0670	-0.0247	0.0008
US CPI Urban Housing Rent	0.6430	0.3073	2.0924	0.0373	0.0380	1.2479

Table 7 OLS Regression Foreclosures 1987-2011

<i>Regression Statistics</i>						
Multiple R	0.6076					
R Square	0.3691					
Adjusted R Square	0.3463					
Standard Error	0.0168					
Observations	287					
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.0041	0.0023	1.7754	0.0769	-0.0004	0.0087
Home Price	-1.2146	0.1453	-8.3621	0.0000	-1.5006	-0.9287
NAHB	0.0107	0.0128	0.8346	0.4046	-0.0146	0.0360
US Unemp. Season adj.	0.0594	0.0390	1.5221	0.1291	-0.0174	0.1361
Homeowner Vacancy Rate	-0.0277	0.0538	-0.5146	0.6073	-0.1335	0.0782
Delinquencies as % of total loans	0.3050	0.0659	4.6286	0.0000	0.1753	0.4347
Fannie Mae 30Y Fixed Rate	-0.0094	0.0248	-0.3787	0.7052	-0.0583	0.0395
CCI	-0.0052	0.0137	-0.3790	0.7050	-0.0322	0.0218
AAIIB	-0.0012	0.0025	-0.4760	0.6345	-0.0062	0.0038
CCI Jobs hard to get	0.0019	0.0177	0.1075	0.9145	-0.0329	0.0367
US CPI Urban Housing Rent	1.4251	0.8324	1.7122	0.0880	-0.2134	3.0637

Table 8. OLS Regression Delinquencies as % of total loans 1987-2011

<i>Regression Statistics</i>						
Multiple R	0.4795					
R Square	0.2299					
Adjusted R Square	0.2020					
Standard Error	0.0148					
Observations	287					
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.0006	0.0020	0.3150	0.7530	-0.0034	0.0047
Foreclosure	0.2362	0.0510	4.6286	0.0000	0.1357	0.3366
Home Price	-0.2595	0.1422	-1.8245	0.0692	-0.5396	0.0205
NAHB	-0.0012	0.0113	-0.1102	0.9123	-0.0235	0.0210
US Unemp. Season adj.	0.0824	0.0341	2.4173	0.0163	0.0153	0.1496
Homeowner Vacancy Rate	0.1118	0.0469	2.3847	0.0178	0.0195	0.2040
Fannie Mae 30Y Fixed rate	-0.0340	0.0218	-1.5637	0.1190	-0.0769	0.0088
CCI	-0.0064	0.0121	-0.5290	0.5972	-0.0301	0.0174
AAIIB	0.0030	0.0022	1.3284	0.1852	-0.0014	0.0074
CCI Jobs hard to get	0.0064	0.0155	0.4109	0.6815	-0.0242	0.0370
US CPI Urban Housing Rent	0.0918	0.7363	0.1247	0.9009	-1.3577	1.5413

Table 9. OLS Regression National Association of Home Builders 1987-2011

<i>Regression Statistics</i>						
Multiple R	0.3937					
R Square	0.1550					
Adjusted R Square	0.1244					
Standard Error	0.0787					
Observations	287					
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.0164	0.0108	1.5165	0.1305	-0.0049	0.0378
Delinquencies as % of total loans	-0.0353	0.3200	-0.1102	0.9123	-0.6653	0.5947
Foreclosure	0.2348	0.2813	0.8346	0.4046	-0.3190	0.7885
Home Price	0.8719	0.7591	1.1487	0.2517	-0.6224	2.3662
US Unemp. Season adj.	0.0166	0.1832	0.0906	0.9279	-0.3441	0.3773
Homeowner Vacancy Rate	-0.3283	0.2510	-1.3084	0.1918	-0.8224	0.1657
Fannie Mae 30Y Fixed rate	0.3088	0.1147	2.6917	0.0075	0.0829	0.5346
CCI	0.3432	0.0608	5.6454	0.0000	0.2235	0.4629
AAIIB	-0.0005	0.0119	-0.0441	0.9649	-0.0240	0.0230
CCI Jobs Hard to get	0.2080	0.0817	2.5474	0.0114	0.0473	0.3688
US CPI Urban Housing Rent	-8.6168	3.8807	-2.2204	0.0272	16.2562	-0.9773

FIGURES

Figure 1. Inflation & Home Price Index 1987-2011

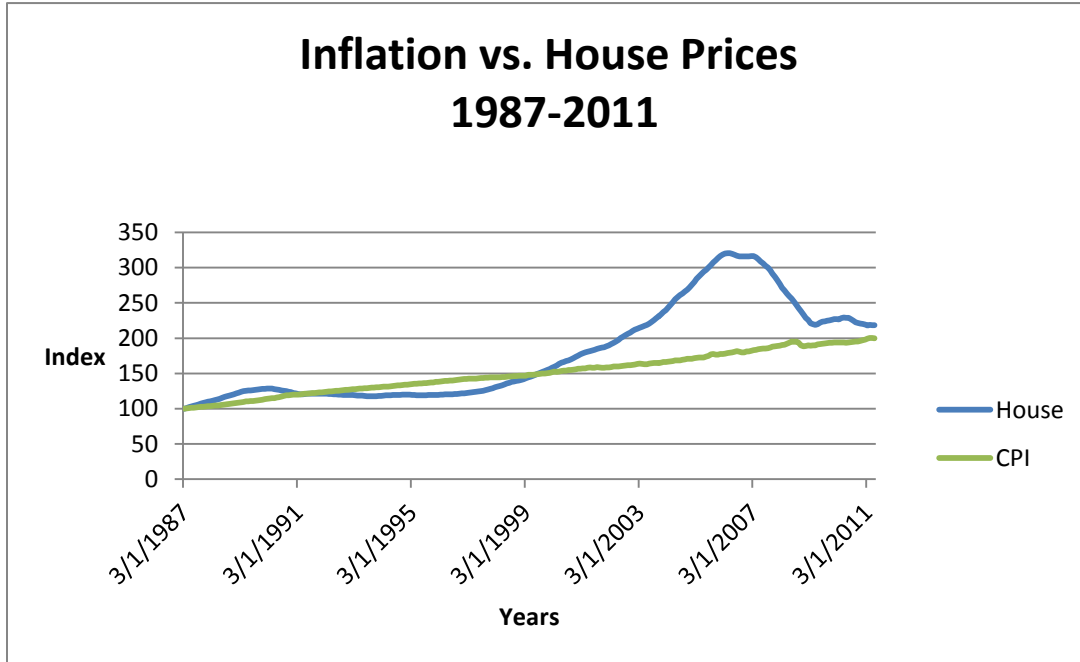


Figure 2. Level and First Difference data for Home Price Index

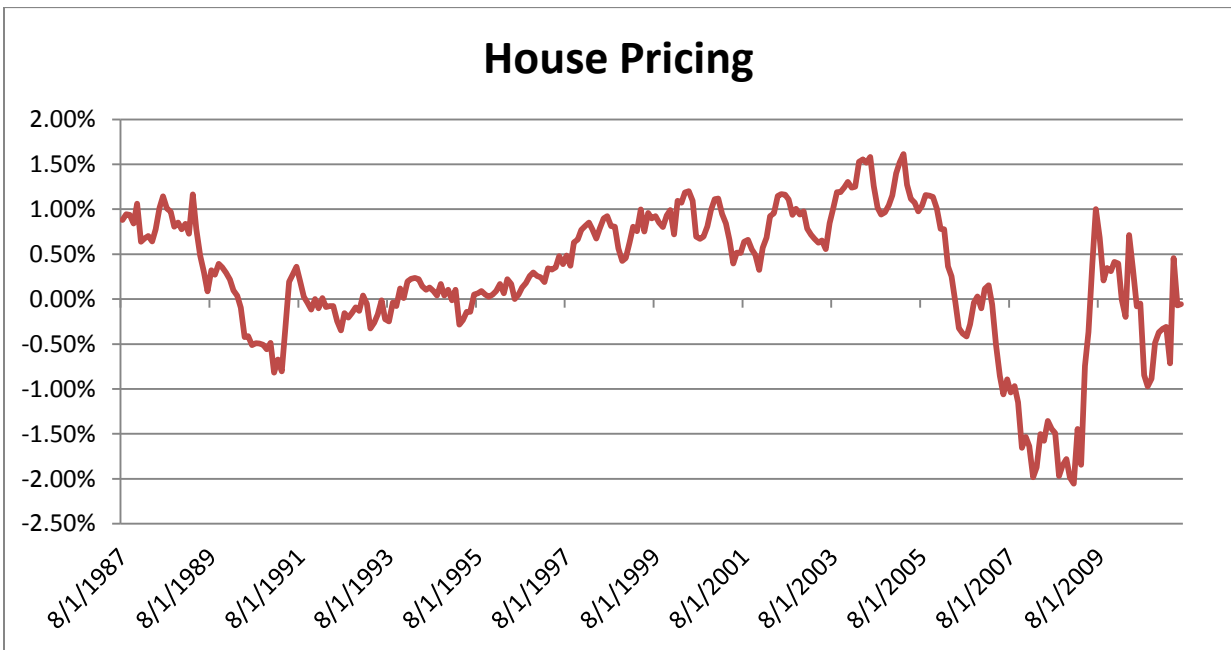
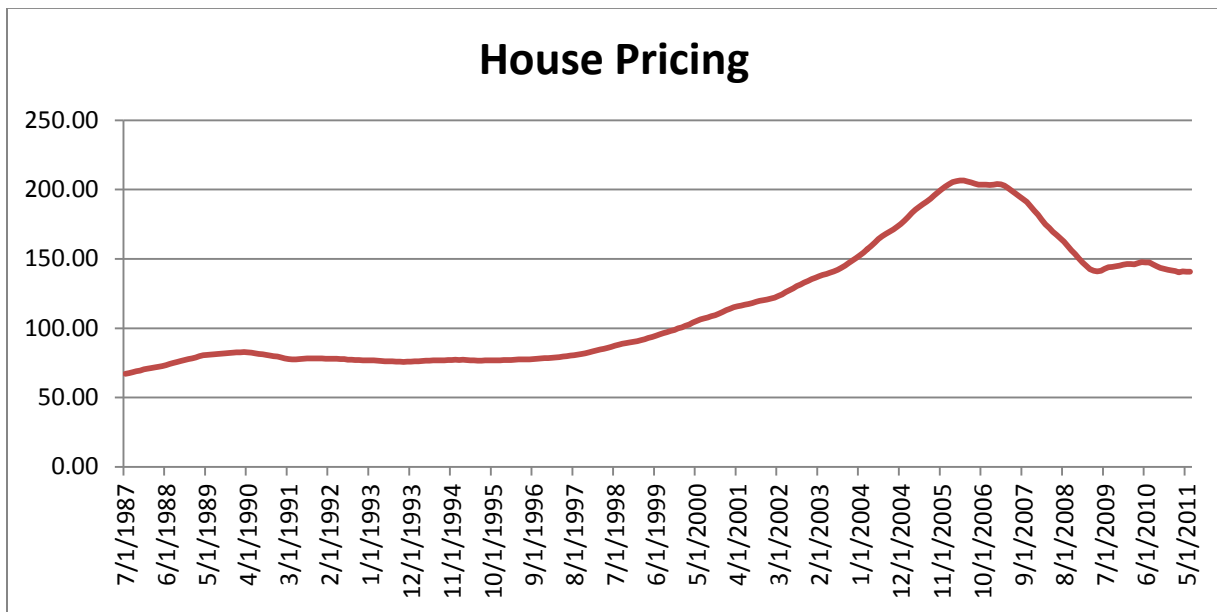


Figure 3. Levels and First Difference Index Foreclosure 1987-2011

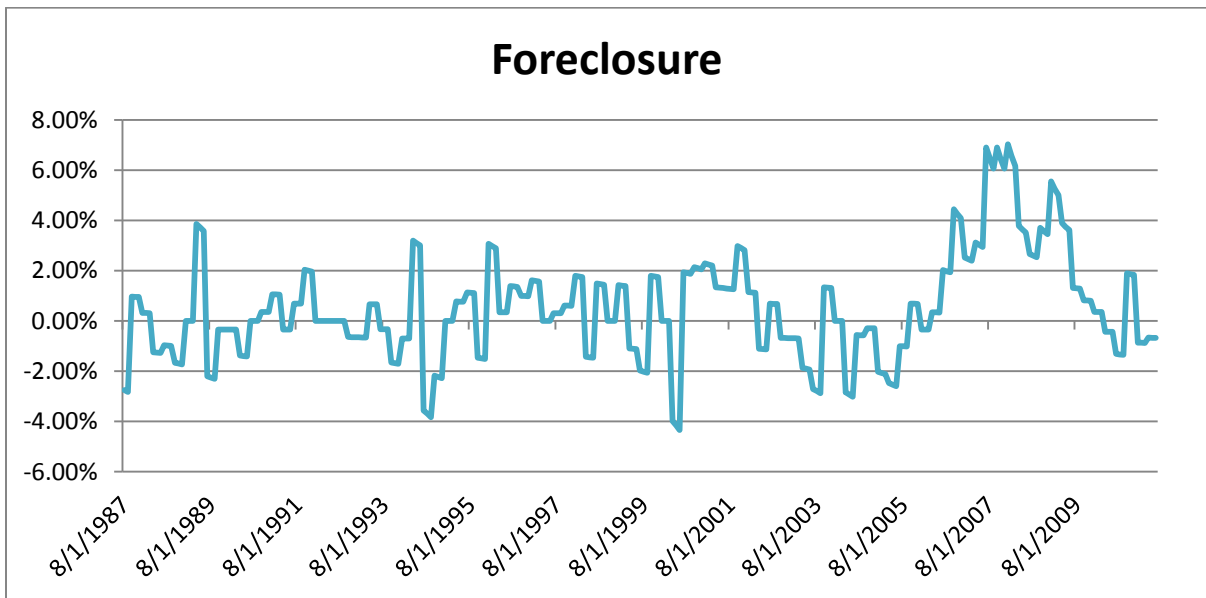
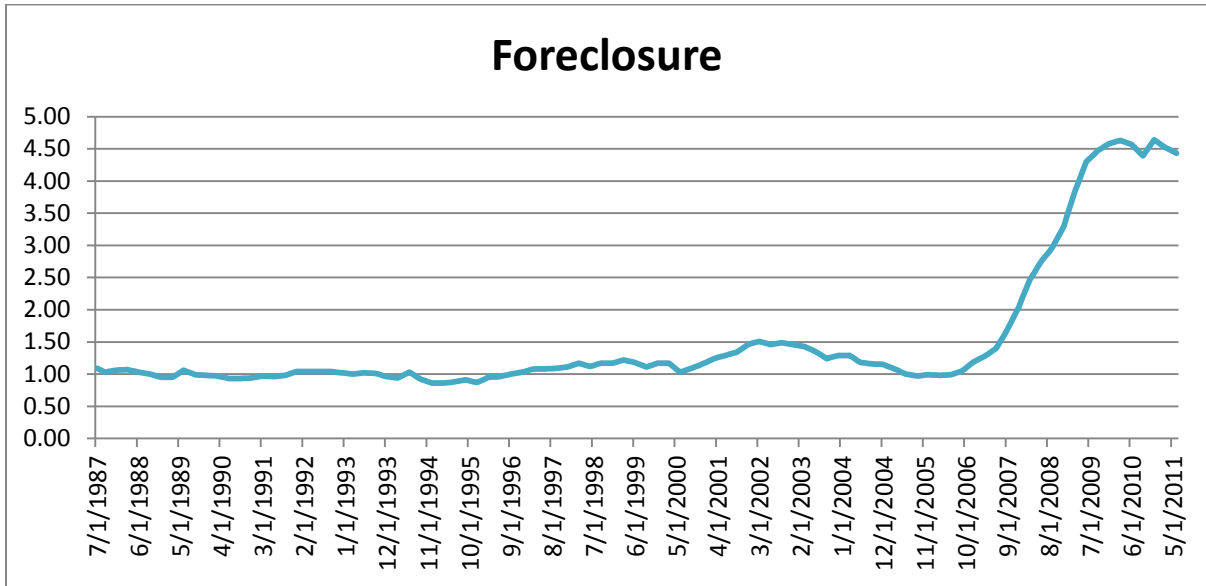


Figure 4. Levels and First Difference Delinquencies 1987-2011

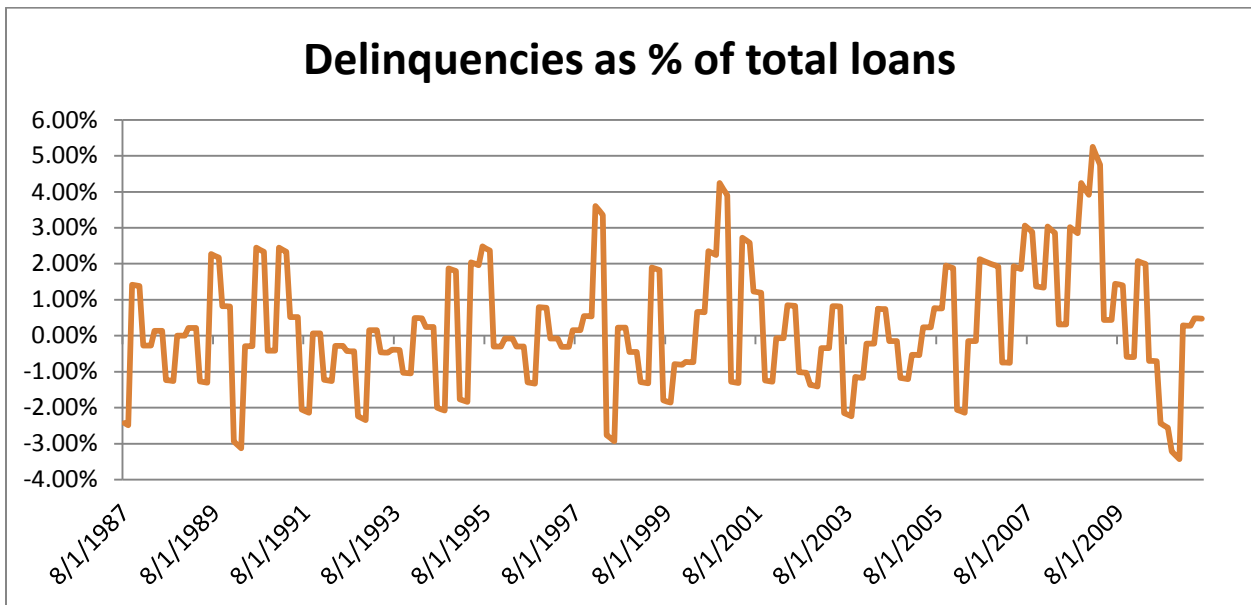
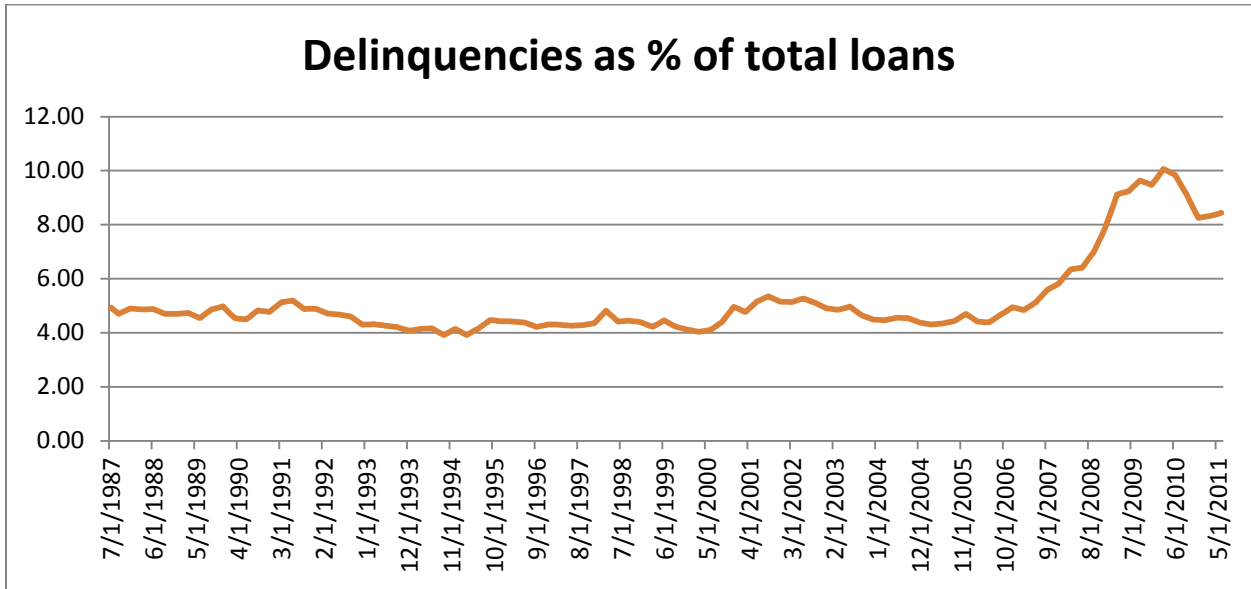


Figure 5. Levels and First Difference National Association of Home Builders 1987-2011

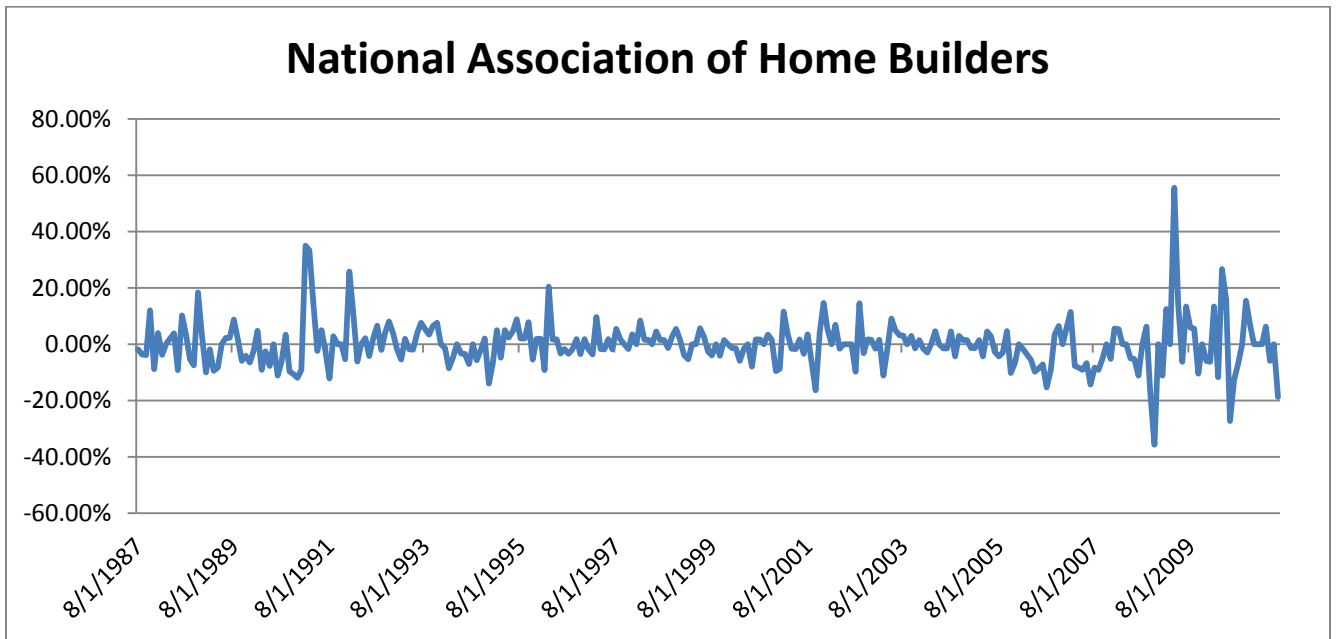
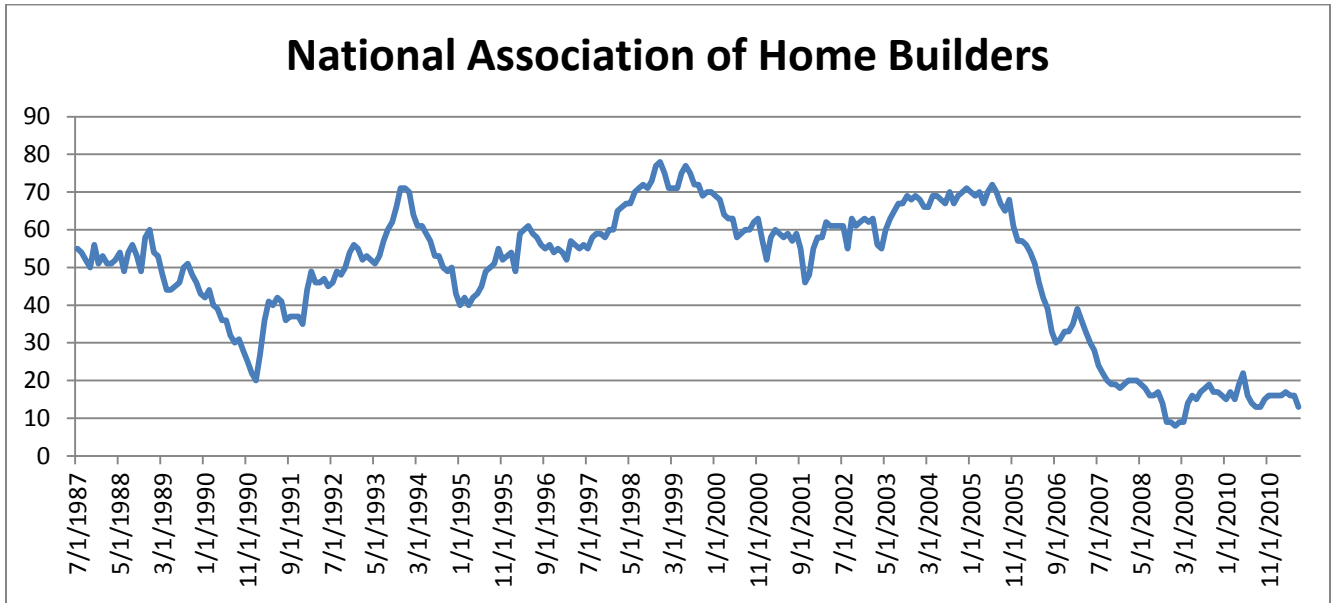


Figure 6. Levels and First Difference Conference Board Consumer Confidence 1987-2011

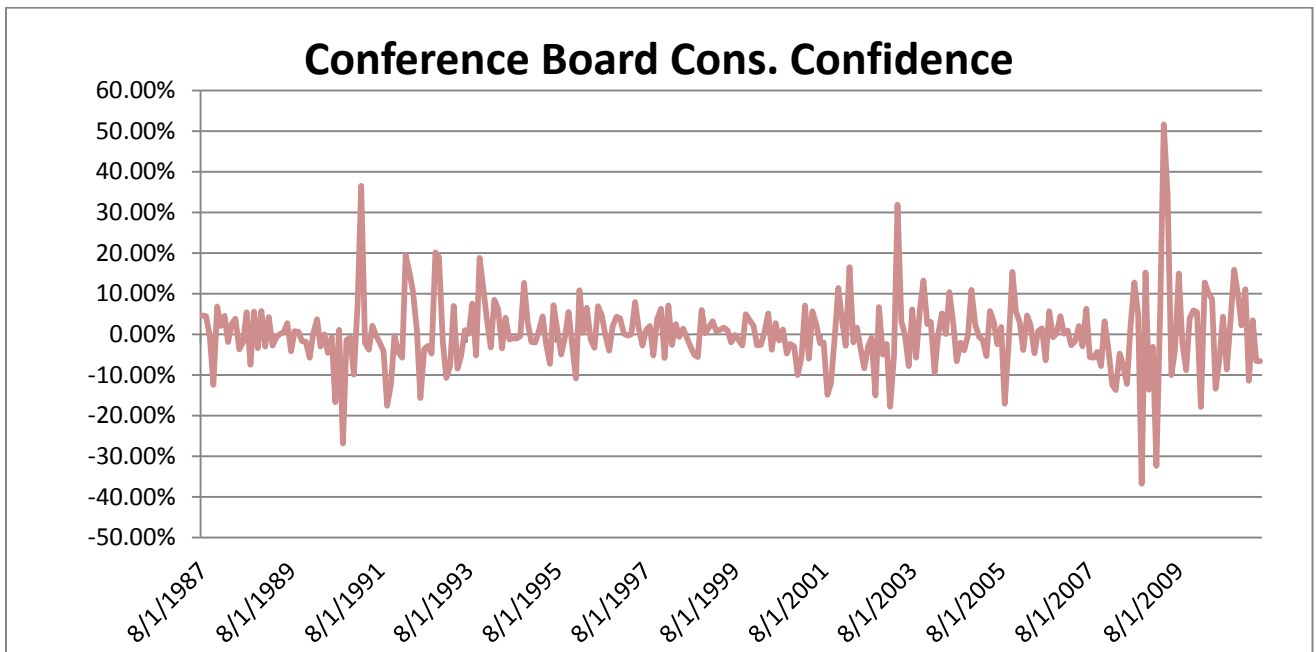
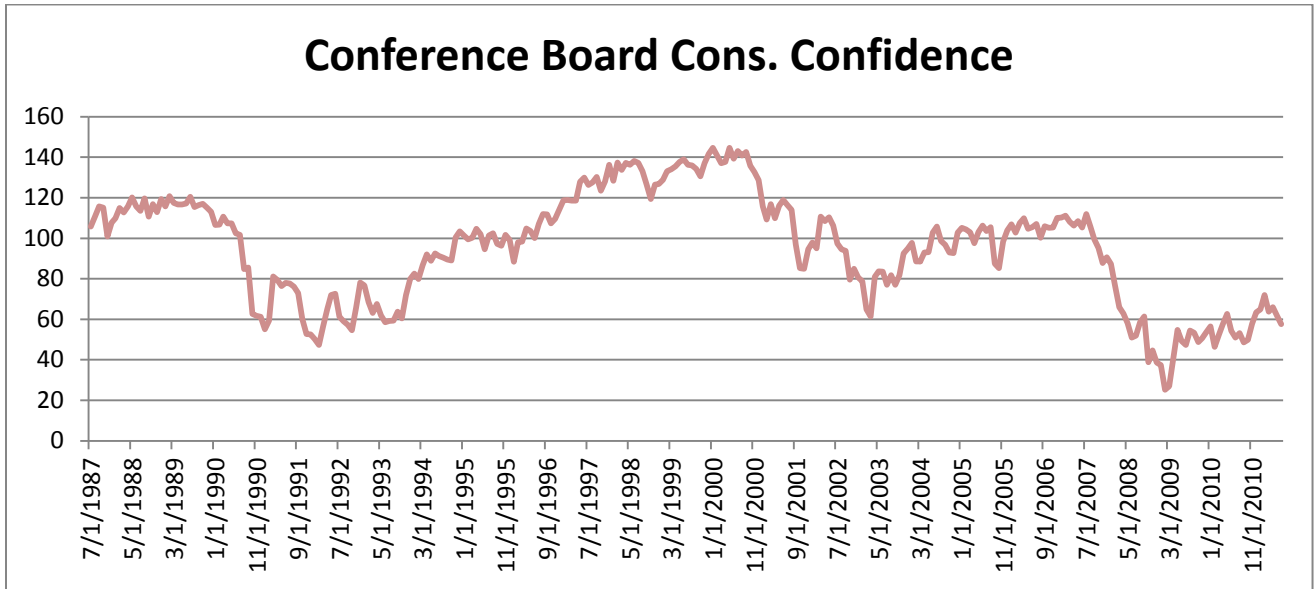


Figure 7. Levels and First Difference Conference Board Consumer Confidence Jobs hard to Get 1987-2011

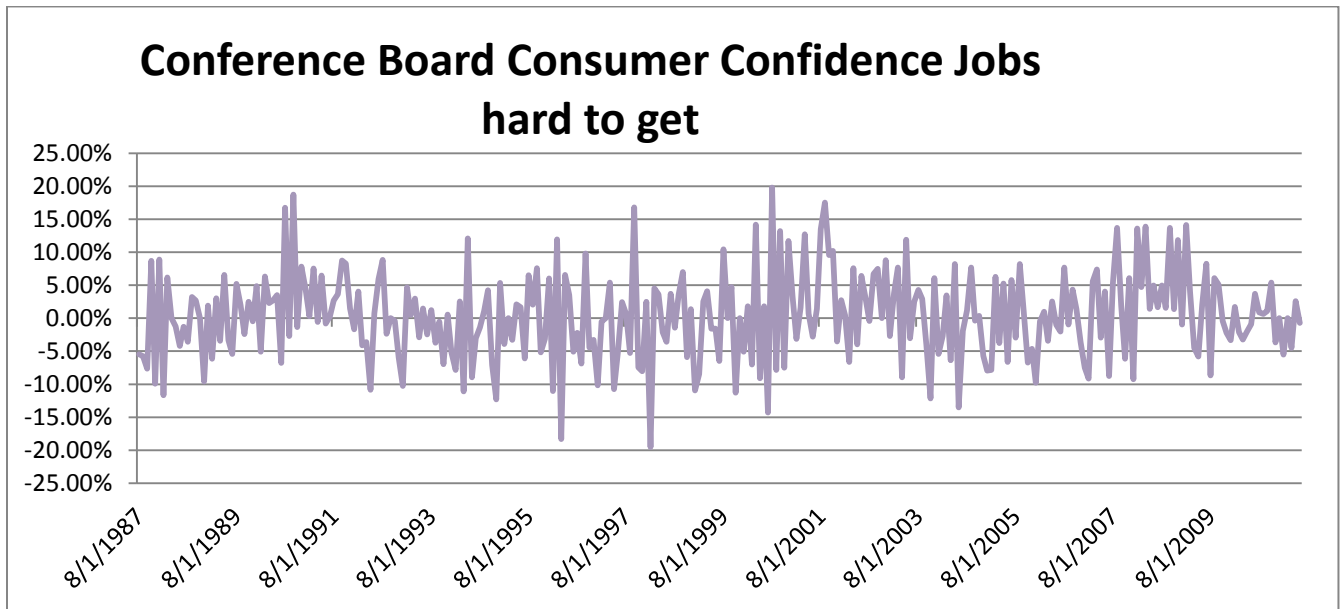
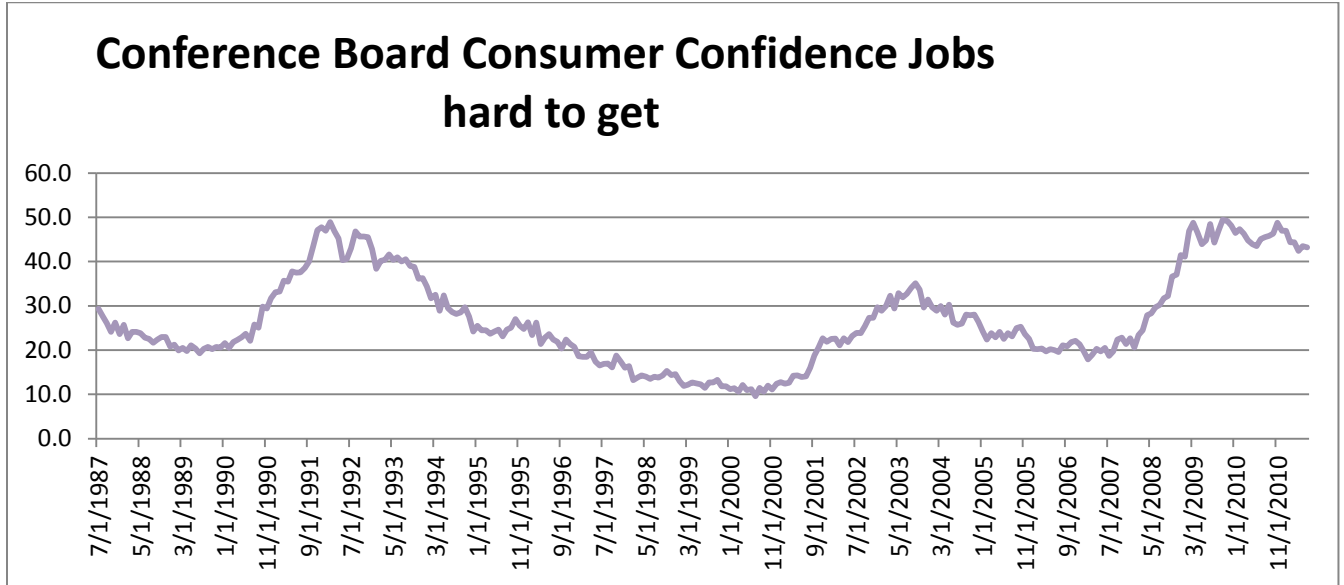


Figure 8. Levels and First Difference Homeowner Vacancy Rate 1987-2011

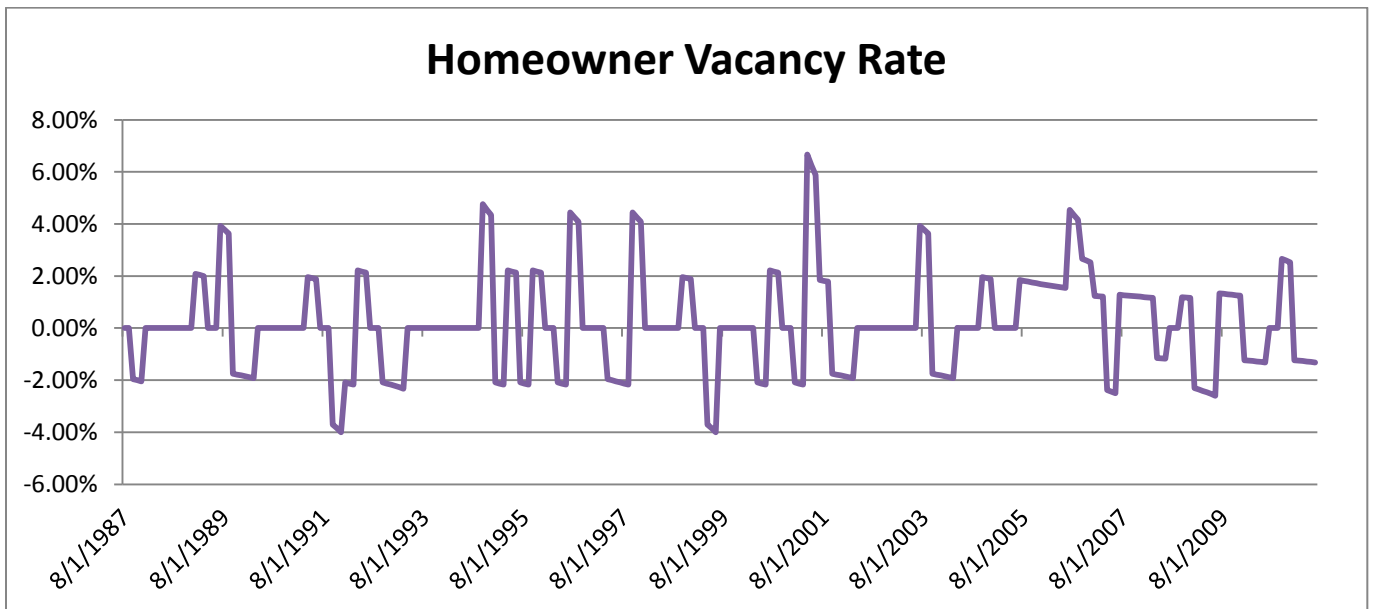
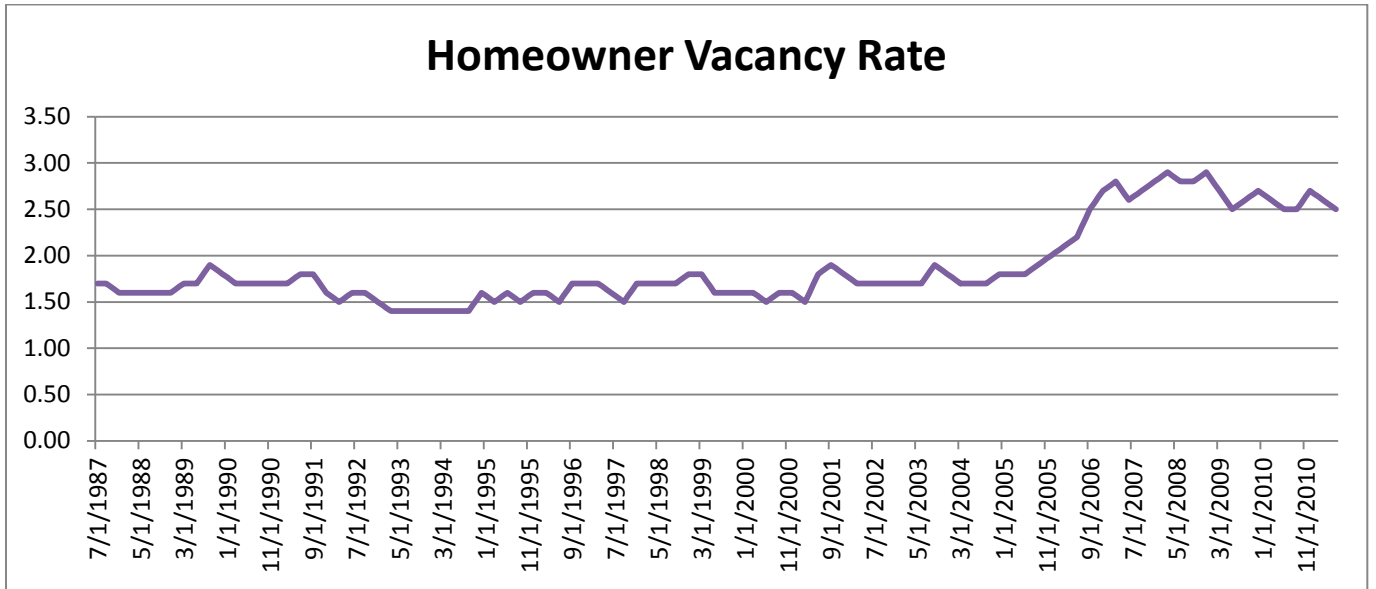


Figure 9. Levels and First Difference Fannie Mae 30Y Fixed Rate 1987-2011

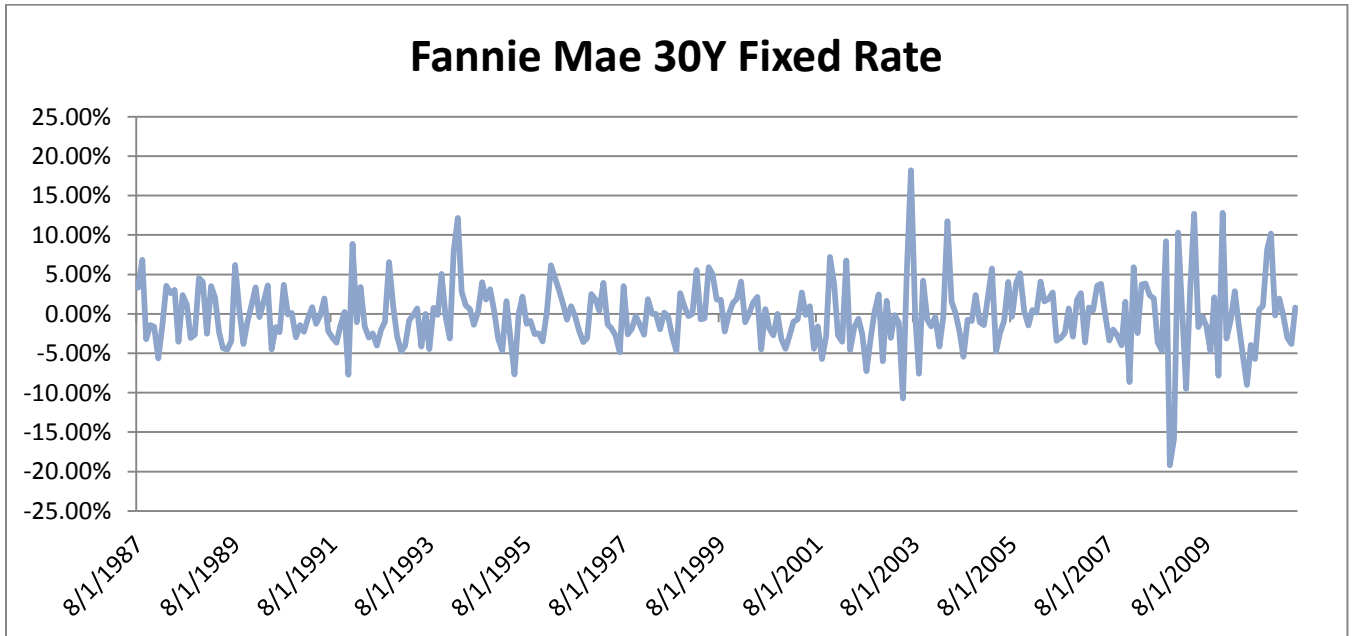
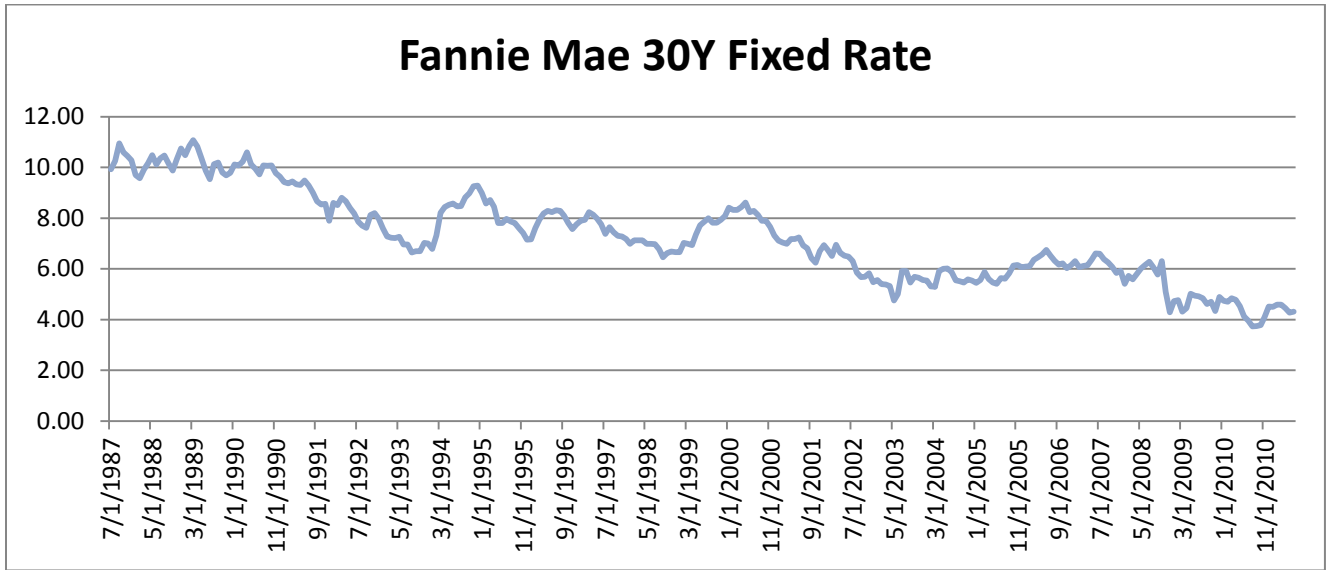


Figure 10. Levels and First Difference US Unemployment Rate Seasonally Adjusted 1987-2011

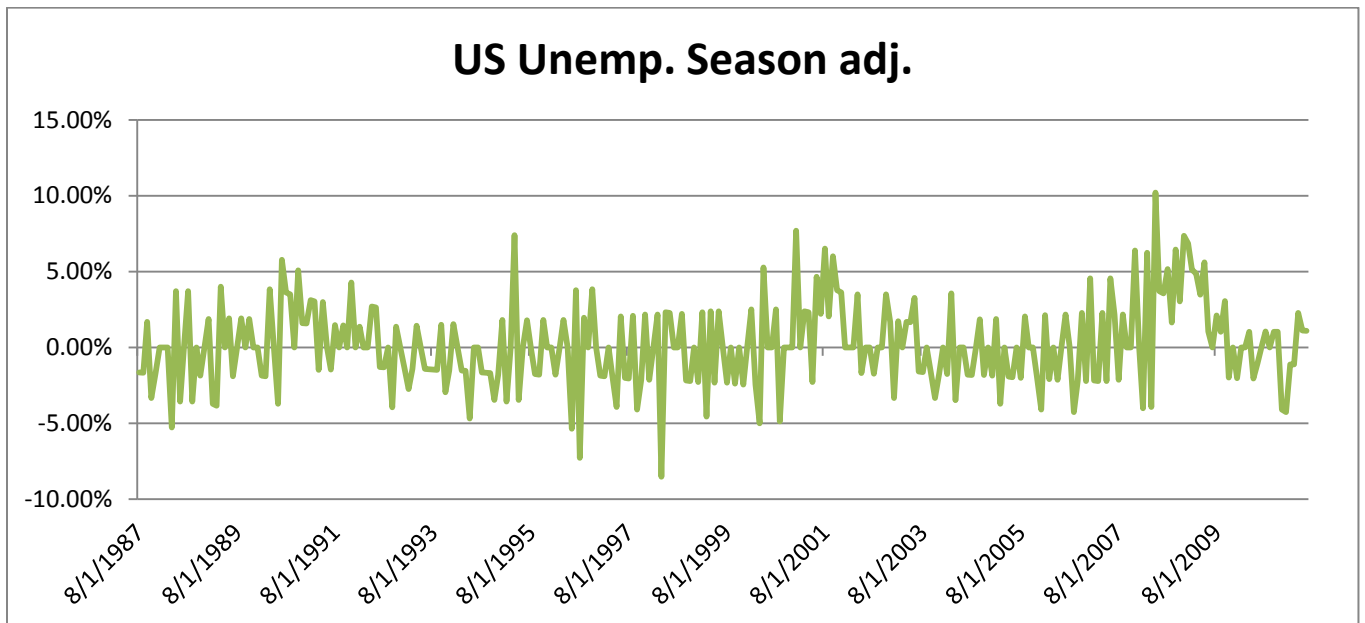
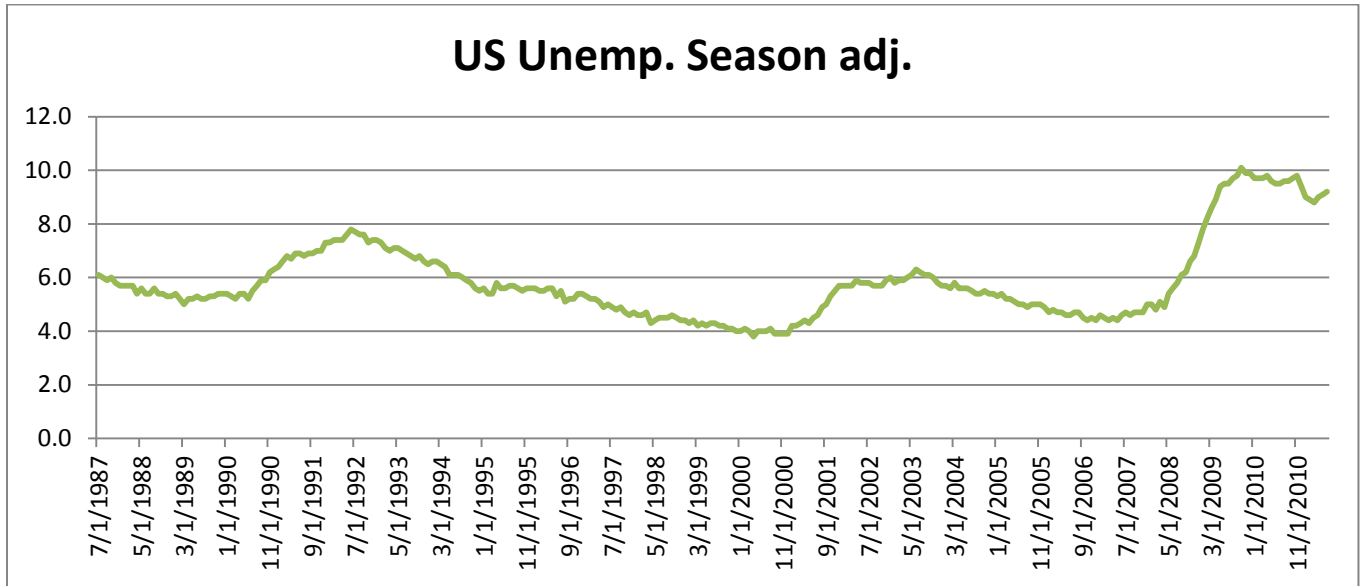


Figure 11. Levels and First Difference CPI Urban Rental Rate 1987-2011

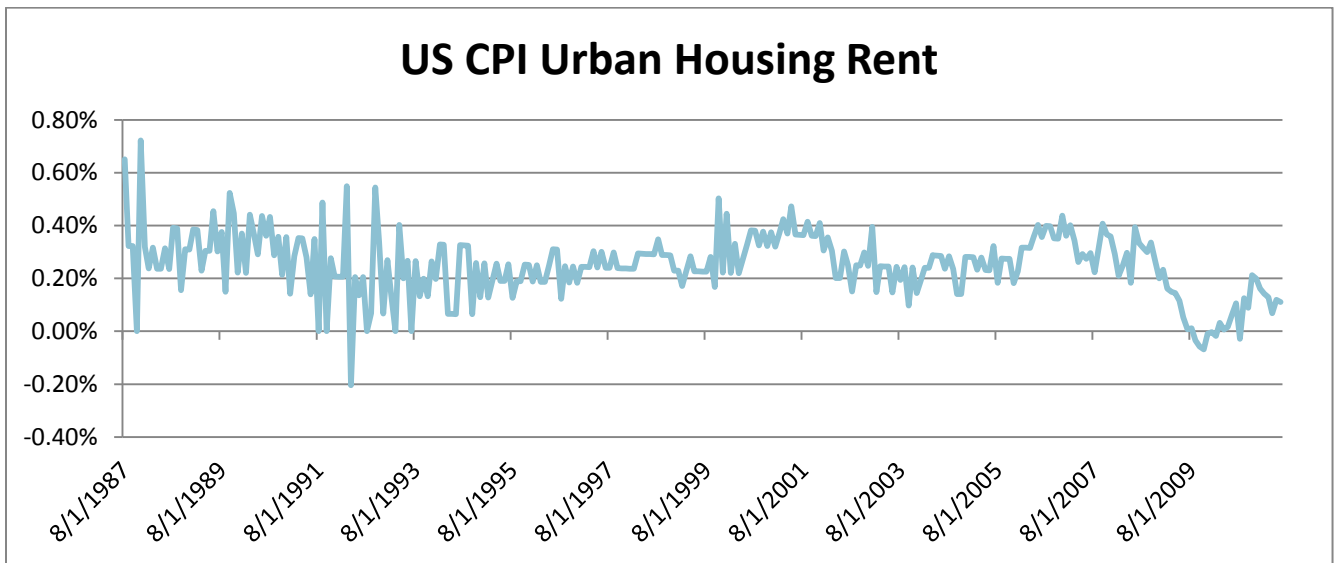
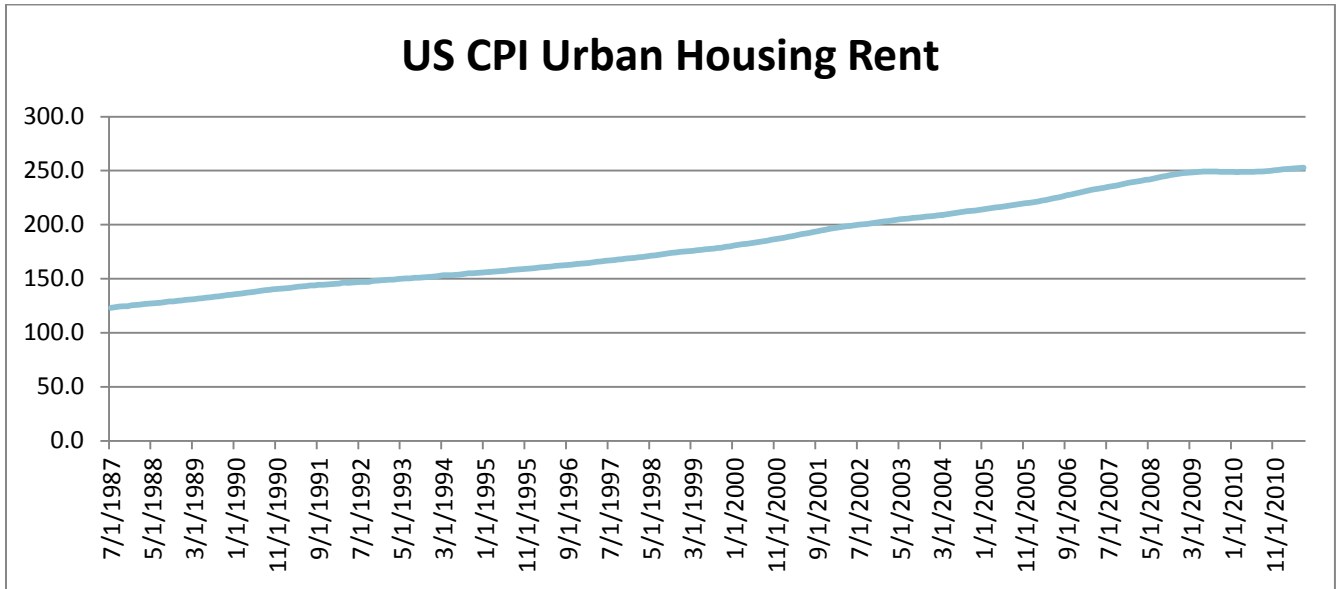
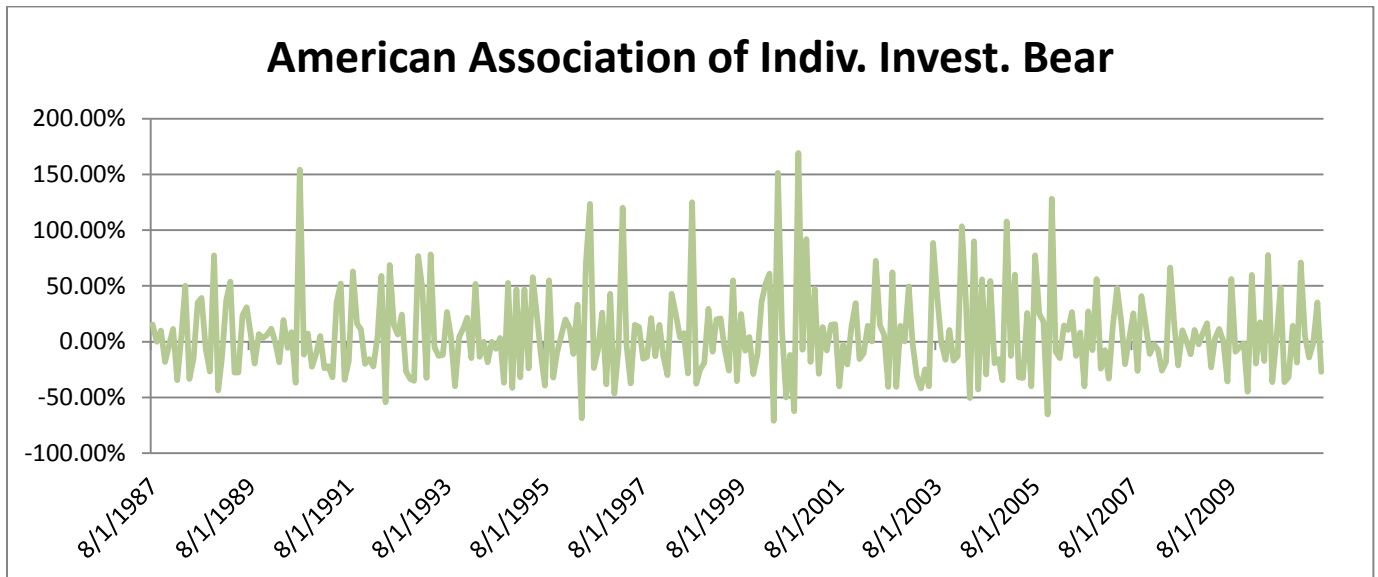
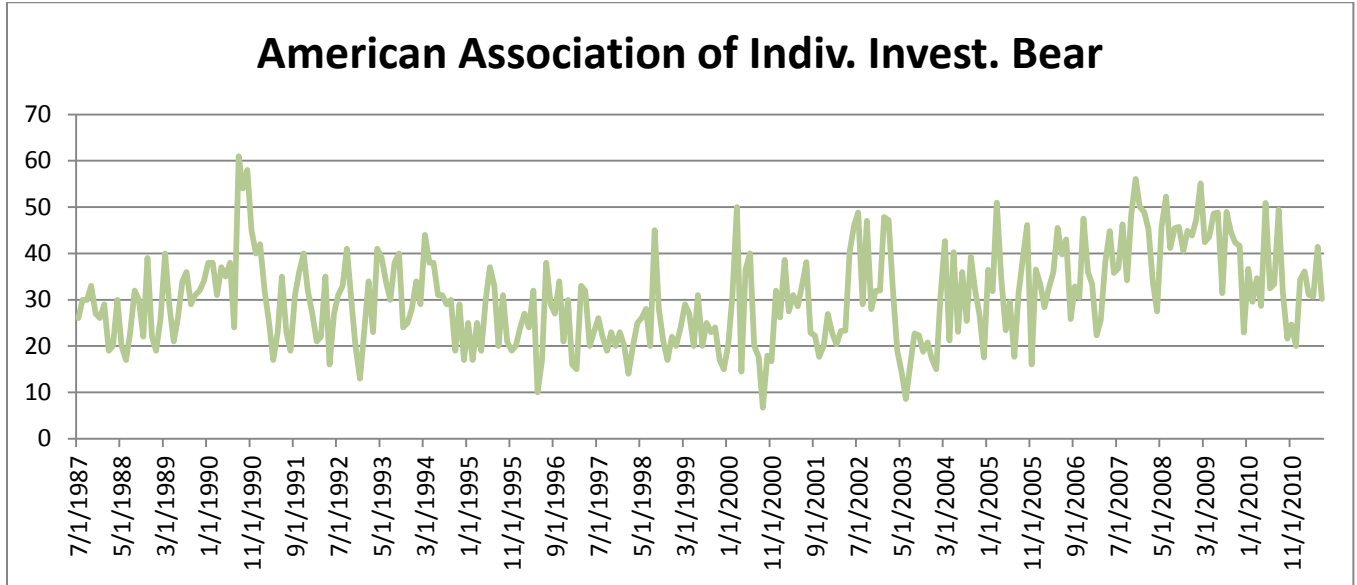


Figure 12. Levels and First Difference American Association of Individual Investors Sentiment Bearish Readings 1987-2011



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