HOW TO MAKE THE AMERICAN DREAM POSSIBLE AGAIN: A QUANTITATIVE LOOK AT HOMEOWNERSHIP AND UNEMPLOYMENT RATES IN THE UNITED STATES FROM 2005-2009

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By

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Abstract

This study explores the relationship between homeownership rates and unemployment rates in the United States from 2005 to 2009 with populations of at least 60,000 through quantitative regression analysis. The study uses data from HUD’s Extract of the American Community Survey (ACS) for the years 2005, 2006, 2007, 2008, and 2009. Similar to previous research completed by Professor Andrew Oswald on this subject, my study uses a linear regression equation, fixed effects, and control variables. In order to test this hypothesis, this paper investigates whether the unemployment rate in jurisdictions over 60,000 people in the United States has a statistically significant effect on the homeownership rate in the United States from 2005 to 2009. Through this research I investigate the existence of a negative correlation between unemployment rates and homeownership rates in the United States. However, unlike Professor Oswald, I do not insinuate that homeownership has a negative effect (higher unemployment) on employment.

The results obtained when testing my hypothesis showed that the unemployment rate was statistically significant at the .10 level. I was able to reject my null in support of my alternative hypothesis. Therefore my assumption was correct – as the unemployment rate increases, the homeownership rate goes decreases in jurisdictions over 60,000. These results provide strong support for Obama Administration’s job creation and
foreclosure prevention programs. Understanding the relationship between unemployment and homeownership rates using recent U.S. jurisdictional data can contribute to the housing policy literature on the importance of job creation and the Administration’s foreclosure prevention programs.

The dataset also allows testing a second regression equation. This regression equation tests Andrew Oswald’s hypothesis that as the homeownership rate increases, the unemployment rate also increases. However, my results, which are statistically significant at all levels, found a different relationship. My results found that as the homeownership rate increases, the unemployment rate actually decreases. In conclusion my research contributes to the housing policy discussion by demonstrating that homeownership and employment are inextricably linked.
Acknowledgements

I would like to thank all those that helped and encouraged me along the way. I dedicate this thesis to my parents who were there every step of the way.

With Sincere Gratitude,
Leigh Szubrowski
Table of Contents

Abstract iii
Acknowledgements v
Table of Contents vi
Table Directory vii
Introduction 1
Literature Review 6
Conceptual Framework and Hypothesis 14
Methodology 17
Results 19
Conclusions and Policy Implications 22
Appendix A: Full Regression Results 25
References 29
**Table Directory**

Table 1: Comparing Outcomes to Oswald’s Findings 13

Table 2: Descriptive Statistics 15

Table 3: Simple regression predicting homeownership rate, 2005-2009 19

Table 4: Simple regression testing Oswald’s hypothesis and predicting unemployment rate, 2005-2009 19

Table 5: Lagged Variable predicting homeownership rate with all control variables, 2005-2009 20

Table 6: Lagged Variable predicting unemployment rate and testing Oswald’s hypothesis with all control variables, 2005-2009 21
Introduction

Over the years the American Dream has been achieved for many families once they have purchased a home. In today’s struggling economy with high unemployment, homeownership has become more difficult. Unemployment rates have been higher than usual in the United States over the last several years with an average unemployment rate of 9.3% in 2009 and 9.6% for 2010. The unemployment rate for October 2011 has declined slightly to 9.0% (Bureau of Labor Statistics, n.d.). However, even in a struggling economy, homeownership remains central to the American Dream (Stretfeld & Thee-Brenan, 2011). A September 2011 survey published by the real-estate site Trulia indicates “that 70 percent of Americans still consider homeownership a central part of the American Dream” (Trulia, 2011). Owning a home brings a sense of pride and accomplishment to many people. With this sense of pride, however, comes the reality of financial responsibility. Potential homeowners are advised to save enough for both known financial obligations as well as the unexpected costs of homeownership.

Most homeowners enter into the responsibility and costs associated with owning a home with the security of employment and a steady paycheck. However, unforeseeable circumstances can arise when people lose their job and are saddled with a mortgage they can no longer afford. Selling their home might not be a viable option due to the sharp decline in home prices. Additionally, the thought of moving to another city for employment or to a rental unit can appear overwhelming because of the transaction costs associated with selling their home. Homeowners then run the risk of foreclosure, and the American Dream they worked so hard to achieve begins to crumble. So, how can policymakers respond when the American Dream turns into a nightmare?
The Obama Administration – particularly the Federal Housing Finance Administration (FHFA), the U.S. Department of Treasury (Treasury), and the U.S. Department of Housing and Urban Development (HUD) – offers a number of programs designed to stabilize the housing market, advise first-time homeowners, and assist recently unemployed homeowners to stay in their homes. One such program administered through HUD is the Housing Counseling Assistance program which is available to individuals, families or groups who are tenants, homeowners or potential homebuyers. The counseling is provided through a HUD-approved housing counseling agency and aims to advise individuals and families on how to finance and maintain a home as well as a rental property (“Housing Counseling Program Description,” n.d.). Additionally, the Making Home Affordable program, administered through HUD and Treasury, provides a temporary reduction or suspension of mortgage payments for at least three months while a homeowner seeks re-employment. The FHFA also recently extended its forbearance period for unemployed homeowners from three months to six months with mortgages owned or guaranteed by Freddie Mac (Congressman Cummings, 2011). The forbearance period will delay a foreclosure and allow homeowners to stay in their homes while they continue to look for work.

Additionally, the Obama Administration has created a number of initiatives in order to spur employment growth. The White House Rural Council was created in August 2011 to leverage resources across the federal government to increase new capital and job training to rural areas so that people have better opportunities for employment. The Small Business Administration announced last year that they would increase the capital going to rural businesses through the Small Business Investment program (The White House, 2011). The White House also announced the Jobs and Innovation Accelerator Challenge winners last fall. This was a multi-agency competition launched to support the advancement of 20 high-growth regional
industry clusters. Three federal agencies and 13 additional agencies providing technical assistance are expected to help advance manufacturing, aerospace and clean technology in rural and urban regions in 21 states. These partnerships are expected to create more than 4800 jobs and 300 new businesses, and most importantly the projects are driven by local communities (Department of Labor, 2011).

It is clear that homeownership and employment are interconnected, but so are homeownership and unemployment. To that end, many researchers have looked at the relationship between homeownership and unemployment rates. In particular, Professor Andrew Oswald completed some interesting and controversial research in the late 1980s and 1990s on the relationship between unemployment and homeownership rates for a cross-section of 20 member countries of the Organization for Economic Cooperation and Development (OECD). He also tested this relationship in the United States using data from the mid-1980s to mid-1990s. His chief finding was that there was a statistically significant relationship between homeownership and unemployment: a 5-percentage-point increase in the rate of home ownership was associated with a 1-percentage-point increase in unemployment (Oswald, 1997). He modeled this finding on the idea that homeowners are less likely to move for a job than renters when they become unemployed because of the transaction costs associated with selling their home. These transaction costs can include moving costs and fees such as legal, real estate, deed and registration fees. In Oswald’s opinion, homeowners were investing in immobility because moving can be so costly (Oswald, 1997).

Oswald’s findings created quite a bit of attention in the labor and housing markets, and thus a number of researchers and economists completed similar studies using different countries and econometric methods to test Oswald’s results. Some of the researchers confirmed Oswald’s
findings while others came to a different conclusion. For example, some concluded that homeownership is associated with lower, not higher, rates of unemployment (Flatau, Forbes, Hendershott & Wood, 2003).

Since researchers found many different ways to interpret Oswald’s conclusion on the relationship between homeownership and unemployment rates, it seems plausible that Oswald has this relationship backwards. When homeowners lose their jobs, they face the loss of the ability to pay their mortgage and can face foreclosure if they remain unemployed. So as unemployment rates rise, homeownership rates may decline. In order to test this hypothesis, this paper investigates whether the unemployment rate in jurisdictions over 60,000 people in the United States has a statistically significant effect on the homeownership rate in the United States from 2005 to 2009. Through this research I investigate the existence of a negative correlation between unemployment rates and homeownership rates in the United States. Unlike Oswald, I do not insinuate that homeownership has a negative effect (higher unemployment) on employment.

The American Dream is still alive today, and steps need to be taken to ensure that homeowners can own responsibly. Of course, homeownership has great value beyond achieving the American Dream. Homeownership brings benefits to neighborhoods, including stabilizing property values, improving social conditions such as lowering high school dropout rates, and encouraging individuals to become more invested in their communities (Rohe, Van Zandt & McCarthy, 2001). From a public policy perspective, this paper provides further support to initiatives that create jobs where the unemployment rates are higher so that homeowners have a better chance of avoiding foreclosure and staying in their homes. Additionally, this paper contributes to the housing policy conversation by demonstrating the important service that the
Administration’s foreclosure prevention and mortgage assistance programs provide to homeowners.
Literature Review

Homeownership: Is It The American Dream?

What does owning a home mean to the majority of Americans? Is homeownership the cornerstone of the American Dream? In 1995, HUD put forward a policy brief that addressed these questions: “The ideal of homeownership is so integral a part of the American Dream that its value for individuals, for families, for communities, and for society is scarcely questioned. The desire for homeownership is deeply rooted in the American psyche. Owning a home embodies the promise of individual autonomy and of material and spiritual well-being that many people sought in coming to this country” (HUD, 1995, p. 1).

The policy brief mentioned above is more than 15 years old, and the economic climate has changed since then. In today’s economic climate, with high foreclosure rates and high unemployment rates across the country, the American Dream of owning a home might seem more like a nightmare to prospective homebuyers. However, research has confirmed that even in these tough economic times – even when housing prices collapsed by 26% in May 2009 (The Economist, 2009, p. 1) – the American Dream is still thriving (Christie, 2010). Thus, more questions are raised: What happens when homeowners suddenly lose their jobs and are left with mortgages they can no longer afford? What can be done from a public policy perspective to ensure that the American Dream continues to thrive?

The Importance of Homeownership

In the early 1990s, the federal government launched the National Homeownership Strategy, whose stated goal was to “attempt to help all American households become homeowners” (Goldstein, February 2011). Even in today’s bleak economy, the American Dream
is still thriving but the Administration has qualified their support for homeownership. A February 2011 housing policy report states:

The Administration believes that we must continue to take the necessary steps to ensure that Americans have access to an adequate range of affordable housing options. This does not mean all Americans should become homeowners. Instead, we should make sure that all Americans who have the credit history, financial capacity, and desire to own a home have the opportunity to take that step. (HUD & Treasury, 2011)

Many researchers analyzed the positive impact of homeownership on society. Homeownership allows households “to accumulate wealth and social status, and is the basis for a number of positive social, economic, family and civic outcomes” (National Association of Realtors, 2010, p. 14). Researchers Donald R. Haurin, Toby L. Parcel, and R. Jean Haurin (2001) concluded that children of homeowners have “better home environments, higher cognitive test scores, and fewer behavior problems than do children of renters. Owning a home compared with renting leads to 13 to 23 percent higher quality home environment, ceteris paribus” (p. 14-15).

Homeownership also has great benefits to the community as whole. For example, homeowners were more politically active than renters, participating in elections much more frequently than renters. A 1998 study by Edward Glaeser and Denice DiPasquale found that “77 percent of homeowners said they had at some point voted in local elections compared with 52 percent of renters” (National Association of Realtors, 2010, p. 10).

It is equally important to keep homeowners in their homes and prevent foreclosures. A 2001 MIT study analyzed the impact of foreclosed homes on neighborhoods. One of the study’s main points was that a house is only “productive” when it is occupied. Having an unoccupied
house is “equivalent to throwing away the dividend on a financial asset” (Campbell, Giglio & Pathak, 2009, p. 1). In the absence of decisive action to prevent foreclosures, it was recently reported on Treasury’s website that “we risk an intensifying spiral in which lenders foreclose, pushing area home prices still lower, reducing the value of household savings, and making it harder for all families to refinance. In some studies, foreclosure on a home has been found to reduce the prices of nearby homes by as much as 9%” (Campbell, Giglio & Pathak, 2009, p. 2).

**Andrew Oswald Sets the Stage**

There has been considerable literature from around the world on the relationship between and interconnectedness of homeownership rates and unemployment rates. People who face unemployment are more likely to live in areas experiencing recession. Recessions that, in turn, can drive down the price of houses and lead to foreclosures (Green & Hendershott, 1999). Employment and job creation are therefore critical to achieving the American Dream. A glimpse at a presidential campaign website or a recent gubernatorial speech in the United States will clearly reveal that job creation is a top policy priority as well (Stewart, 2011).

Andrew Oswald completed some of the most famous studies, and arguably the impetus for subsequent studies, while he was at the University of Warwick in 1996 and 1997. He wanted to explain the high unemployment rates of the Western economies. Oswald claimed that when individuals or a family bought a house they invested in immobility. Homeowner immobility was a result of the overly burdensome transaction costs associated with selling a home and moving for a new job (Oswald, 1997).

Therefore, Oswald believed that because of the increase in homeownership rates and immobility and a decline in private renting in the Western economies, unemployment rates rose.
He analyzed data for Western economies, and some of his most notable research was for the OECD\(^1\) countries. A statistically significant relationship between homeownership rates and unemployment rates was confirmed (Oswald, 1996). His controls included tax rate, union density, employment protection, and benefit duration to name a few. While renters did not have the same freedoms to alter their accommodations or the pride of owning a home, they did have more of an ability to pack up and move because they were not restricted by homeowners’ transaction costs (Oswald, 1996 and 1997).

Oswald also completed similar research in the United States from the mid-1980s to the mid-1990s. He used a fixed effects model and panel data to conclude that homeownership and unemployment rates were correlated (Oswald, 1996).

Oswald’s findings on the direction and size of the relationship between homeownership and unemployment were met with much interest from labor and housing economists. However, Andrew Oswald remarked in his paper that his findings should be used as “exploratory rather than definitive” (Oswald, 1996, p. 16), thus leaving the door open for future researchers to further test and possibly confirm his conclusions. For example, researchers Mark Patridge and Dan Rickman (1997) analyzed state homeownership and unemployment data in the United States and confirmed Oswald’s findings.

**Challenging Oswald’s Conclusions**

Not all interested researchers came to the same conclusion as Oswald. A 2003 paper tested Oswald’s thesis using data from Australia and found a different relationship between homeownership and unemployment rates. These researchers found that as homeownership rates
increased, unemployment rates decreased (Flatau, Forbes, Hendershott, & Wood, 2003). What accounted for this different conclusion? Their 2003 study is interesting because it was constructed differently than previous studies testing Oswald’s thesis. The researchers divided ownership into different categories of ownership (or degrees of leverage) and types of tenants (outright owners, owners with mortgages, private renters, public renters, and rent-free). The different relationship between homeownership rates and unemployment rates in Australia was the result of having a category of highly leveraged owners (those who borrow more to buy their home) who had a greater incentive to remain employed or find employment than outright owners (Flatau, Forbes, Hendershott, & Wood, 2003).

Additionally, the researchers pointed out that Oswald’s findings ignored the concept of public housing and rent-free housing. These very low-income renters were locked into their present living situations and faced a different type of transaction cost when considering a move for employment. If low-income individuals needed to move, their transaction costs would include the potential loss of low-cost housing, which was also very daunting and could be cost prohibitive. Flatau et al. (2003) found that unless leverage and multiple rental categories were utilized, a comprehensive overview of how housing affected the labor market was difficult to attain.

Researchers Edward Coulson and Lynn Fisher (2009) also challenged Oswald’s hypothesis using U.S. data and ran five models using an instrumental variable approach. They concluded that while “homeowners are less likely to be unemployed; they also have lower wages, all else equal, compared to renters” (p. 252). Coulson and Fisher also looked at the suggestions made by the Oswald hypothesis that homeownership not only had negative consequences for the individual of higher unemployment, but also led to inefficiencies in the
labor market. From the point of view of society as a whole, Coulson and Fisher’s analysis found a different result: as homeownership increases, unemployment decreases and, thus, productivity increases.

Oliver Lerbs conducted a study using 2010 German regional homeownership and unemployment data to test Oswald’s hypothesis using three different econometric models: a cross-sectional model, a panel data model, and a pooled data model. A cross-sectional model utilizes data that describes many individuals or units at one point in time. If the same units of a cross-section model are surveyed at two or more times across a sequence of time periods, the model is utilizing pooled data (Thomas, 2011). Finally, panel data analysis is a method of studying a particular subject or subjects within multiple sites (or characteristics), periodically observed over a defined time frame (Yaffee, 2003). Depending on the econometric model that was utilized, different results were found. Lerbs (2010) concluded that there was an inverse relationship between homeownership and unemployment rates in cross-section and pooled models, but a weakly positive relationship when fixed effects were used.

In another study, Richard Green and Patric Hendershott (2000) confirmed Oswald’s findings using a regression weighted by U.S. state populations for the 35-to-64 age group. In a subsequent study, Hendershott and Green (2001) again confirmed Oswald’s findings using individual household U.S. data, but the quantitative impact was only about an eighth of the impact suggested by Oswald.

Hendershott and Green attributed the difference between their results and Oswald’s results to a lack of accounting for other variables (covariate analysis). Even though Oswald includes controls for union coverage, he is criticized for not controlling for unemployment benefits. Hendershott and Green also noted that Oswald’s study has been criticized for his lack
of weighted regressions such that small regions were given as much emphasis in his analysis as large regions (Hendershott and Green, 2001).

After reviewing some of the studies that tested Oswald’s thesis, it is evident that different conclusions can be drawn depending on the data organization and the methodology used to test the data. For example, a researcher can attain different results and possibly an inverse relationship between unemployment and homeownership rates by using either individual-level data or household level data. In Table 1 below (Lerbs, 2010, p.4), Regional Units defines the data organization for the study, Methodology signals what type of statistical test was used and the Effect defines the direction of the relationship between homeownership and unemployment rates. As Table 1 displays, “some studies corroborate the direction and strength of the relationship originally found by Oswald (Partridge and Rickman, 1997; Pehkonen, 1999; Cochrane and Poot, 2007), others contradict his findings or challenge them at least in part (Green and Hendershott, 2001; Flatau et al., 2002; Glaeser and Shapiro, 2003; Garcia et al., 2004; Coulson and Fisher, 2009)” (Lerbs, 2010, p.4).
Table 1: Comparing Outcomes to Oswald’s Findings

<table>
<thead>
<tr>
<th>Author and Year</th>
<th>Regional Units</th>
<th>Methodology</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oswald 1996, 1999</td>
<td>Different Countries/regions</td>
<td>cross-section/first diff.</td>
<td>+</td>
</tr>
<tr>
<td>Patridge/Rickman 1997</td>
<td>U.S. states</td>
<td>pooled cross-section/panel</td>
<td>+</td>
</tr>
<tr>
<td>Pehkonen 1999</td>
<td>Finnish labor districts</td>
<td>Cross-section</td>
<td>+</td>
</tr>
<tr>
<td>Green/Hendershott 2001</td>
<td>U.S. states</td>
<td>First differences</td>
<td>+/-</td>
</tr>
<tr>
<td>Flatau et al. 2002</td>
<td>Australian regions</td>
<td>Cross-section</td>
<td>-</td>
</tr>
<tr>
<td>Glaeser/Shapiro 2003</td>
<td>U.S. MSAs</td>
<td>Cross-section</td>
<td>-</td>
</tr>
<tr>
<td>Garcia/Hernandez 2004</td>
<td>Spanish provinces</td>
<td>Cross-section</td>
<td>-</td>
</tr>
<tr>
<td>Cochrane/Poot 2007</td>
<td>New Zealand census regions</td>
<td>Pooled cross-section /panel</td>
<td>+</td>
</tr>
<tr>
<td>Coulson/Fisher 2009</td>
<td>U.S. MSAs</td>
<td>Cross-section</td>
<td>-</td>
</tr>
</tbody>
</table>

As stated previously, the American Dream is still thriving and people continue to buy homes. In this thesis I look at the relationship between homeownership and unemployment rates in the United States using jurisdictional level data with populations of 60,000 and above. Building on Oswald’s research and the subsequent findings, I ask: does the unemployment rate in the United States have a statistically significant effect on the homeownership rate in the United States from 2005 to 2009? Understanding the relationship between unemployment and homeownership rates using recent U.S. jurisdictional data can contribute to the housing policy literature on the importance of job creation and the Administration’s foreclosure prevention programs.
Conceptual Framework and Hypothesis

To conduct my research I use the HUD’s Extract of the American Community Survey (ACS) for the years 2005, 2006, 2007, 2008, and 2009. I then append the one-year datasets into one dataset. The ACS is conducted every year through the U.S. Census Bureau and provides data on such characteristics as employment and income so that policy makers can make informed decisions on how to allocate roughly about $400 billion dollars in state and federal funds through communities (U.S. Census Bureau, 2011).

My research tests whether the unemployment rate in the United States has a statistically significant effect on the U.S. homeownership rate from the period of 2005 to 2009 for jurisdictions with populations that exceed 60,000. My panel data includes a total of 2,565 observations, and my level of observation is year by jurisdiction with a population of 60,000 and above.

My one-year datasets from the ACS contain 23 variables on poverty status in the past 12 months and three variables on tenure. From the merged one-year datasets, I created a variable for the U.S. unemployment rate from the poverty status variables and a variable for the U.S. homeownership rate from the tenure variables. Specifically, I created the U.S. homeownership rate variable by dividing the owner occupied variable by the tenure total variable. Further, I created the U.S. unemployment rate variable by first creating the U.S. employment rate variable and then subtracting it from one.

Table 2 offers descriptive statistics on my two variables of interest and my control variables.
Table 2 – Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Max</th>
<th>Min</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowner_rate</td>
<td>Homeownership rate, 20005-2009</td>
<td>59.00%</td>
<td>95.28%</td>
<td>18.22%</td>
<td>12.39%</td>
</tr>
<tr>
<td>Unemploy_rate</td>
<td>Unemployment rate, 2005-2009</td>
<td>7.78%</td>
<td>28.32%</td>
<td>.87%</td>
<td>3.62%</td>
</tr>
</tbody>
</table>

Control Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Max</th>
<th>Min</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pr_pplbelow50K</td>
<td>Proportion of people making $50K or below, 2005-2009</td>
<td>.51</td>
<td>.83</td>
<td>.09</td>
<td>.14</td>
</tr>
<tr>
<td>Pr_loweduc</td>
<td>Proportion of people holding at least a high school education , 2005-2009</td>
<td>.42</td>
<td>.82</td>
<td>.10</td>
<td>.13</td>
</tr>
<tr>
<td>Pr_married</td>
<td>Proportion of people married, 2005-2009</td>
<td>.49</td>
<td>.71</td>
<td>.20</td>
<td>.08</td>
</tr>
</tbody>
</table>

The null hypothesis I test is: $H_0$: *Holding all else constant, the U.S. unemployment rate has no effect on the US homeownership rate in jurisdictions over 60,000 from 2005 to 2009.*

The alternative hypothesis I test is $H_a$: *Holding all else constant, the U.S. unemployment rate has an effect on the U.S. homeownership rate in jurisdictions over 60,000 from 2005 to 2009.*

I anticipate that the unemployment rate will have a negative effect on the homeownership rate. More specifically, I anticipate that as the U.S. unemployment rate increases, the U.S. homeownership rate decreases in jurisdictions over 60,000 from 2005-2009.

Similar to Andrew Oswald’s research, I utilize a linear regression for the homeownership and unemployment variables I created. I also use entity-fixed effects to control for non-time varying characteristics of the jurisdictions. Some examples of these effects might include the total housing stock, the gender ratio, or major industries that employ workers in the jurisdictions of interest. I also include control variables for income, marital status, and education level. The income control variable measures the proportion of people that make less than $50,000. The education control variable measures the proportion of people that have at least a high school
education. The marital status control variable measures the proportion of people that are currently married.

The regression equation I test is:

\[
\text{Homeowner_rate}_{i(t)} = \beta_0 + \beta_1 \text{Unemploy_rate}_{i(t-1)} + \beta_2 \text{Pr_loweduc}_{i(t-1)} + \beta_3 \text{Pr_pplbelow50K}_{i(t-1)} + \beta_4 \text{Pr_married}_{i(t-1)} + \text{FE}_i + \epsilon_{it}
\]

\(t=\) time period (year)
\(\alpha=\) entity fixed effects
\(\epsilon=\) error term, random
Methodology

I use the data described above and two different regression equations. The first full regression equation tests my null hypothesis that holding all else constant, the U.S. unemployment rate has no effect on the US homeownership rate in jurisdictions over 60,000 from 2005 to 2009. The full regression equation I use to test my hypothesis is:

\[ \text{Homeowner_rate}_{i(t)} = \beta_0 + \beta_1 \text{Unemploy_rate}_{i(t-1)} + \beta_2 \text{Pr_loweduc}_{i(t-1)} + \beta_3 \text{Pr_pplbelow50K}_{i(t-1)} + \beta_4 \text{Pr_married}_{i(t-1)} + FE_i + \epsilon_{it}. \]

The dataset also allows testing a second regression equation. This regression equation tests Andrew Oswald’s hypothesis that as the homeownership rate increases, the unemployment rate also increases. That full regression equation I use to test Oswald’s hypothesis is:

\[ \text{Unemploy_rate}_{i(t)} = \beta_0 + \beta_1 \text{Homeowner_rate}_{i(t-1)} + \beta_2 \text{Pr_loweduc}_{i(t-1)} + \beta_3 \text{Pr_pplbelow50K}_{i(t-1)} + \beta_4 \text{Pr_married}_{i(t-1)} + FE_i + \epsilon_{it}. \]

In addition to using entity fixed effects, I lag my independent variable and control variables by one year in both of my regression equations. When running my regressions and when testing Oswald’s hypothesis, I work under the assumption that changes in these variables will take time to affect the local unemployment rate. I also use robust standard errors to correct for any variance in my error term (or heteroskedasticity).

I began my analysis by running a two variable OLS regression. I did this to see the relationship between my two variables before adding in control variables or robust standard errors. The first regression equation tests my hypothesis. I regress my dependent variable (homeownership rate) on my lagged independent variable (unemployment rate). To test Oswald’s hypothesis, I run a two variable regression that regresses the dependent variable (unemployment rate) on the lagged independent variable (homeownership rate).
I then introduce fixed effects and control variables to the equation. I run three separate regressions to test my hypothesis, and I introduce a different control variable into each equation. I also run the corresponding regressions to test Oswald’s hypothesis. The next three regressions I run to test my hypothesis are:

1) \[ \text{Homeowner}_i(t) = \beta_0 + \beta_1 \text{Unemploy}_i(t-1) + \beta_2 \text{Pr}_{\text{married}}_i(t-1) + \text{FE}_i + \epsilon \]

2) \[ \text{Homeowner}_i(t) = \beta_0 + \beta_1 \text{Unemploy}_i(t-1) + \beta_2 \text{Pr}_{\text{loweduc}}_i(t-1) + \text{FE}_i + \epsilon \]

3) \[ \text{Homeowner}_i(t) = \beta_0 + \beta_1 \text{Unemploy}_i(t-1) + \beta_2 \text{Pr}_{\text{pplbelow50K}}_i(t-1) + \text{FE}_i + \epsilon \]

Oswald’s 1997 regression equations introduce more control variables than my regression equations. His additional control variables tend to focus on an individual’s union participation and benefits in the OECD countries (Oswald, 1997). I did not think it was necessary to control for this in my equations using U.S. data since I was using fixed effects. Oswald’s research also differs from mine because he uses year dummies. Instead of using year dummies, I account for variation over time with lagged independent and control variables.
Results

In running my first set of regressions with a lagged independent variable (unemployment rate to test my hypothesis and homeownership rate to test Oswald’s hypothesis) to test my hypothesis and Oswald’s hypothesis all coefficients were statistically significant as displayed in Tables 3 and 4.

Table 3: Simple regression predicting homeownership rate, 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemploy_rate</td>
<td>-1.20***</td>
<td>.09</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

Table 4: Simple regression testing Oswald’s hypothesis and predicting unemployment rate, 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowner_rate</td>
<td>-.06***</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

As I introduced a control variable, robust standard errors, and fixed effects into each of my regressions to test my hypothesis, my independent variable (homeownership rate) was statistically significant at the .10 level only when controlling for income level. Then I went through the same process to test Oswald’s hypothesis. My independent variable, unemployment rate, was statistically significant at all levels when running separate regressions with each of the three control variables.

Once I introduced the three control variables together, robust standard errors, and fixed effects into my regression to test my hypothesis, all coefficients were statistically significant. My independent variable, the unemployment rate, was statistically significant at the .10 level. I was
able to reject my null in support of my alternative hypothesis. Therefore my assumption was
correct – as the unemployment rate goes up, the homeownership rate goes down in jurisdictions
over 60,000. The interpretation of my results is that a one percentage point increase in the
unemployment rate in the United States is associated with a .08 percentage point decrease in the
homeownership rate the following year. My $R^2$ of .0772 can be interpreted as 7.72% of the
variation in the homeownership rate is explained by the unemployment rate. These results are
displayed in Table 5.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment_rate</td>
<td>-.08*</td>
<td>.04</td>
</tr>
<tr>
<td>Pr_married</td>
<td>.11***</td>
<td>.03</td>
</tr>
<tr>
<td>Pr_pplbelow50K</td>
<td>.15***</td>
<td>.02</td>
</tr>
<tr>
<td>Pr_lowedu</td>
<td>.09***</td>
<td>.03</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

When I tested Oswald’s hypothesis using the three control variables together, fixed
effects and robust standard errors, I obtained an interesting set of results. As a reminder, Oswald
found that as the homeownership rate increased, the unemployment rate also increased.
However, my results, which are statistically significant at all levels, found a different
relationship. My results, as displayed in Table 6 below, found that as the homeownership rate
increases, the unemployment rate actually decreases. The results can be interpreted as a one
percentage point increase in the U.S. homeownership rate is associated with a .2 percentage point
decrease in the unemployment rate the following year. My $R^2$ of .0932 can be interpreted as
9.32% of the variation in the unemployment rate can be explained by the homeownership rate.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>homeownership_rate</td>
<td>-.20***</td>
<td>.03</td>
</tr>
<tr>
<td>Pr_married</td>
<td>-.13***</td>
<td>.02</td>
</tr>
<tr>
<td>Pr_pplbelow50K</td>
<td>-.21***</td>
<td>.02</td>
</tr>
<tr>
<td>Pr_lowedu</td>
<td>-.25***</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01
Conclusion and Policy Implications

Policy Implications

My hypothesis that the U.S. unemployment rate would have a negative effect on the U.S. homeownership rate was confirmed. This conclusion contributes to the housing policy discussion and makes a case for the important role that the current Administration’s initiatives around job creation and foreclosure prevention programs have. Homeownership is part of the American Dream and positively impacts and strengthens local communities. In order to achieve this dream and own a home, potential homeowners need to be employed so they can afford their mortgages and save for unplanned expenses.

Additionally, when looking at the inverse relationship and testing Oswald’s hypothesis, I found that as the homeownership rate goes up, the unemployment rate actually goes down. This seems to make more intuitive sense than Oswald’s original hypothesis that as the homeownership rate goes down, the unemployment rate goes up. This gives further support to the fact that homeownership is associated with being employed.

On a policy level, the results from testing my hypothesis provide support that the Obama Administration should continue to create job creation programs such as the Jobs and Innovation Accelerator Challenge so that people can stay in their homes and avoid a foreclosure, or have an opportunity to take part in the American Dream. Homeownership provides a sense of accomplishment and it makes for stronger communities. A stable housing market is one of the main drivers of the upward trend that our country’s economy is currently on. Ensuring that the population is employed and able to stay in their homes will continue to trend the economy upwards.
A stable housing market is built on both responsible lending and homeowners that are well-informed about purchasing and owning a home, therefore being less likely to enter foreclosure. Homeownership should continue to be a part of the American Dream, and HUD’s housing counseling program needs to receive increased funding in FY13 so that homeowners have the resources to make responsible decisions on when and if the timing is right for them to become homeowners.

**Recommendations for future studies**

There were some limitations to my study that should be addressed by future researchers. The biggest limitation is that I used U.S. data from the time period of 2005 to 2009 to create the homeownership and unemployment rates. This time period contained the biggest housing price crash in our nation’s history. Housing prices peaked in 2006 and then began a steady decline in 2007. There was an increase in the foreclosure rate from about 2006 to 2007, and prices did not hit bottom till around 2011 (Mulligan, 2010). The country was also going through a recession with abnormally high unemployment in 2008 and 2009. This series of events likely skewed my data and included extremes in the numbers of individuals buying homes and those unemployed during the time period I studied (Puzzanghera and Lifsher, 2009). A recommendation for a future researcher would be to use data during a more stabilized economy.

Another recommendation for future researchers would be to identify the trends and locations of the highest unemployment rates in the data. I analyzed the data across the US without identifying areas “highest need” or highest unemployment. For a future study, it would be beneficial to identify the areas with the highest unemployment rates in the US so that federal dollars and job creation/foreclosure prevention initiatives could be concentrated in those areas.
Conclusion

The American Dream is here to stay. Potential homeowners and current homeowners need to be knowledgeable about the process of buying a home and the responsibilities that come along with it. There are a number of job creation and foreclosure prevention initiatives from the Obama Administration that help to ensure current homeowners and potential homeowners are on the path to achieving and maintaining that Dream. Janis Bowdler from the Council of La Raza is quoted, “Homes will continue to be the largest asset that most families own. The evidence clearly shows that when families receive sound advice and a responsible loan, they build equity that can become the foundation for retirement or a child’s education” (Bowdler, 2011). My research contributes to this discussion by demonstrating that homeownership and employment are inextricably linked.
Appendix A: Full Regression Results

Table 4: Simple regression predicting homeownership rate, 2005-2009
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemploy_rate</td>
<td>-1.20***</td>
<td>.09</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

Table 5: Simple regression testing Oswald’s hypothesis and predicting unemployment rate, 2005-2009
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowner_rate</td>
<td>-.06***</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

Table 6: Lagged Variable predicting homeownership rate, 2005-2009
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemploy_rate</td>
<td>.001</td>
<td>.04</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

Table 7: Lagged Variable predicting unemployment rate and testing Oswald’s hypothesis, 2005-2009
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowner_rate</td>
<td>-.16***</td>
<td>.03</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01
### Table 8: Lagged Variable predicting homeowner rate with control variable (education), 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemploy_rate</td>
<td>-.01</td>
<td>.04</td>
</tr>
<tr>
<td>Pr_loweduc</td>
<td>.14***</td>
<td>.03</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

### Table 9: Lagged Variable predicting unemployment rate and testing Oswald’s hypothesis with control variable (education), 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowner_rate</td>
<td>-.17***</td>
<td>.03</td>
</tr>
<tr>
<td>Pr_loweduc</td>
<td>-.32***</td>
<td>.03</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

### Table 10: Lagged Variable predicting homeownership rate with control variable (income), 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment_rate</td>
<td>-.08*</td>
<td>.04</td>
</tr>
<tr>
<td>Pr_pplbelow50K</td>
<td>.19***</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01
Table 11: Lagged Variable predicting unemployment rate and testing Oswald’s hypothesis with control variable (income), 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
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</thead>
<tbody>
<tr>
<td>Homeowner_rate</td>
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<td>Pr_pplbelow50K</td>
<td>-.29***</td>
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</table>

*p<0.10, **p<.05, *** p<.01

Table 12: Lagged Variable predicting homeownership rate with control variable (married), 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment_rate</td>
<td>-.01</td>
<td>.04</td>
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<tr>
<td>Pr_married</td>
<td>.16***</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

Table 13: Lagged Variable predicting unemployment rate and test Oswald’s hypothesis with control variable (married), 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeownership_rate</td>
<td>-.13***</td>
<td>.03</td>
</tr>
<tr>
<td>Pr_married</td>
<td>-.22***</td>
<td>.02</td>
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</tbody>
</table>

*p<0.10, **p<.05, *** p<.01
Table 14: Lagged Variable predicting homeownership rate with all control variables, 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
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<tr>
<td>Unemployment_rate</td>
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<td>Pr_pplbelow50K</td>
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<td>Pr_lowedu</td>
<td>.09***</td>
<td>.03</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01

Table 15: Lagged Variable predicting unemployment rate and testing Oswald’s hypothesis with all control variables, 2005-2009

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
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<tbody>
<tr>
<td>Homeownership_rate</td>
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<td>.03</td>
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<tr>
<td>Pr_married</td>
<td>-.13***</td>
<td>.02</td>
</tr>
<tr>
<td>Pr_pplbelow50K</td>
<td>-.21***</td>
<td>.02</td>
</tr>
<tr>
<td>Pr_lowedu</td>
<td>-.25***</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p<0.10, **p<.05, *** p<.01
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