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The effect of the unemployment rate on the homeownership rate with focus on recent graduates

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Honors Capstone Project in Your Major

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Abstract

How does the ownership of dwellings by recent graduates reflect the business cycle? This paper focuses on the relationship between the unemployment rate and the ownership of dwelling for recent graduates. Scholars have been analyzing the relationship between the ownership of dwellings and unemployment for decades. Most studies find out that home ownership seems to constrain the labor mobility and therefore, it can result in higher unemployment. However, in this paper, the focus is on recent graduates, which means there will be limited influence of labor mobility. The ownership of dwelling data is obtained from the IPUMS CPS and the unemployment rate is accessed from the United States department of Labor. In this paper, I will expect a negative relationship between the unemployment rate and the ownership of dwelling for recent graduates. I will focus on the people who received high education (two-year college and above) and graduates from school no more than five years. Given that the unemployment rate is an important indicator of the business cycle, it is reasonable to assume that the lower unemployment rate would result in higher purchase power for the dwellings, and thus a higher rate of ownership of dwellings. Also, the head of the dwelling will have a different outcome compared with the people only living in the dwelling.

Executive Summary

This paper use STATA to analyze the relationship between the unemployment rate and the homeownership rate. The unemployment rate data is derived from the United States department of Labor and the other demographic data is obtained from IPUMS CPS. The result shows there is a negative relationship between the unemployment rate and the homeownership rate. Also, it shows that people who born around 1980 have the highest homeownership rates, because 2000 has the lowest unemployment rate for 31 years, when people reached their 20 years old. It is also shown that education plays an important role in the homeownership rate. For highly educated people, they have a comparably higher homeownership rate at the same age.

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Introduction

The relationship between the unemployment rate and homeownership has been controversial. There are two main streams in this topic. One is represented by A.J. Oswald, who argues that there is a positive relationship between home ownership and the unemployment rate due to less mobility of homeowners compared with non-homeowners such as renters. One of the specific examples that he used to introduce his argument is that between 1950s to 1960s, the United States had the highest unemployment rate as well as the highest homeownership rate. As shown in his paper, he tried to persuade people that by lowering the homeownership rate, the unemployment rate will decrease, and therefore people will have a better well-being. On the opposite, Michiel Leuvensteijn and Pierre Koning argue that the housing decision is affected by the job commitment, and not in the reverse direction. Therefore, there isn't substantial evidence showing the unemployment rate has something to do with immobility brought by homeowners.

Richard K. Green and Patric H. Hendershott scrutinized Oswald's theory across the different states in the United States. They found that even though they found similar pattern as what Oswald found for the middle-age class, however, there exists many selectivity biases. By eliminating the electivity biases, there isn't substantial evidence showing the effect of homeownership on the unemployment rate.

In my paper, I am analyzing the effect of unemployment rate on the homeownership rate with focus on recent graduates. There are mainly two reasons for me to choose this focus. First, with the focus on the recent graduates, the effect of the unemployment rate on the homeownership rate will be more effective in in terms of showing the influence of business cycle. As the students graduated from universities usually find jobs and start to earn income. The

unemployment rate which reflects the difficulty of finding the job plays an important role for recent graduates. If the unemployment rate is relatively higher, then it would easier for the recent graduates to find jobs. Therefore, it would be easier and sooner for them to purchase housings. As introduced by A.J. Oswald, the job mobility is one significant influence the relationship between the unemployment rate and homeownership rate. By narrowing the focus on recent graduates, the effect of job mobility will be lower significantly because the recent graduates are more likely to purchase housing in the same location as their jobs. It also shows there are significant difference between the high educated people and lower educated people.

By examining the data, it is noticeable that there is a negative relationship between the unemployment rate and the homeownership rate, which can be explained by the theories that have been illustrated above.

Chapter 2

Literature Review

A.J. Oswald has proved that there is a positive relationship between home ownership and unemployment rates. Oswald argues that compared with the renters, the owner of the dwellings is less mobile and are less willing to move to places where more jobs are available. Many reasons contribute to this situation, such as the lump-sum costs occurred when the home was brought, financing, and selling a house. From Oswald's study, he came up with an outstanding result, the countries or regions with ten percent increase in ownership of dwelling rates also have two percent increase in unemployment rate. The data that Oswald was using mostly is in European regions and U.S. states.

Oswald claims that the reason why there is a rise in European unemployment rate was the rise in ownership of dwelling in Europe since 1960. Also, he contends that the differences in the unemployment rate among countries explains why there are differences in housing ownership rates among different countries and regions. In other words, from Oswald's point of view, the high ownership will have negative effect on the employment.

In his The Housing Market and Europe's Unemployment: A Non-Technical Paper, he mentions three examples across the world to prove his argument. In the major industrial nations, Spain has the highest unemployment, and it also has the highest rate of homeownership. The second example is that Switzerland has the lowest unemployment and at the same time, it has the lowest homeownership rate. The third example is that from 1950s to 1960s, the United States had the highest unemployment rate, and in the same time, it also had the highest rate of

homeownership. What he is arguing is that the unemployment rate depends on the level of the mobility of people. In other words, for homeowners, since they own the house, they have higher cost to move to other places to find jobs when they lost jobs. He concluded that the housing market probably have effect on the labor mobility. By pointing out that the homeownership has an negative influence on the unemployment rate, he argued that renting will allow people to be mobile, and thus, the unemployment rate can be raised.

In his paper, he explains the mechanism behind his theory in five different parts correlated with each other. The first one is one straight-forward outcome of homeownership. It is expensive to sell houses and move to another place, which means for those homeowners who lost jobs, they are less likely to move out and therefore, they would intend to commute long distances for work. Given that they are longer commute time, it makes homeowners less mobile than renters. In this way, they are less competitive and more likely to be influenced by the economic downturns in their locations.

The second component in his argument is that unemployed people are not able to move to the correct places. Compared with lower homeownership levels, higher homeownership levels prevent young people from going to a right place to try to find a job. For those who are unable to purchase houses due to insufficient capital, it is hard for them to enter to a place where ownership is the dominant way of housing. Oswald had one example for this part. In the UK, one of the most important reason for unemployment is that young unemployed people are hardly to move out home due to the scarcity of the rental sector.

Thirdly, as people are immobile, they are more likely to find less suited jobs. In other words, this is one kind of inefficiency which hurts the whole society. There are many negative effects

brought by this type of inefficiency. On the one hand, it increases the costs of production and on the other hand, it decreases the income. To move further, in the less mobile society, prices need to be higher and the salaries need to be lower. In other words, the efficiency of the society is ruined, especially when compared with more mobile societies.

The next step of Oswald's theory is that high homeownership will lower the interest of entrepreneurs to start their business. Therefore, this area will lose the opportunity to provide numerous job positions brought by business start-ups. That has to do with the side effects brought by high homeownership. Since there is a high homeownership, these people with dwelling would tend to set restrictions and laws to increase the value of their dwellings, which means there will be higher costs for entrepreneurs.

Finally, given that there are more homeowners having long commute time, it might result in traffic congestion. Therefore, the traffic will take longer and make it harder for everyone to go to work. If it is harder for people to go to work, then in other words, it lowers the benefits for going to work. That is to say, going to work become less attractive, which increase the unemployment rate.

To conclude A.J. Oswald's idea, his main topic is that the less mobility in a high homeownership society will result in a higher unemployment rate in the five focus: higher moving-out costs, less likelihood of finding the right place to live, inefficiency of the society, lower interest for entrepreneurs to start business, and transportation congestion.

On the opposite, economists however find homeowners to be less vulnerable to unemployment. In Michiel Leuvensteijn and Pierre Koning's paper, titled the effect of home-

ownership on labor mobility in the Netherlands, they argue that the housing decision is determined by job commitment, and it is not true in the opposite direction.

They argued that for those economists who found there is a positive relationship between homeownership and unemployment rate, their findings were based on macro or meso-economic data. However, these findings did not touch on the behaviors of individuals. In their paper, they use longitudinal data of individual employees, which is able to find the relationship between homeownership and labor mobility. By using longitudinal data, they are able to see the effect of homeownership in job mobility and the chances of losing jobs by looking at the changes on the housing market and on the labor market. To be more specific, they used the Income Panel Research data from 1989 to 1998 focusing on the changes between jobs, unemployment or employment and etc.

As a result, they concluded that the homeowners face fewer job-to-job transitions, but they have a lower risk of becoming nonparticipant or unemployed. Also, the increase in job duration, age and wage level increases the possibility of becoming homeowners. In the housing model, it is said that it is more likely for someone to own a home if he or she has larger job commitment. In other words, whether to buy or not to buy a house is determined by the job commitment. By regarding job tenure as a control variable, they find there isn't obvious relationship between homeownership and job mobility. To be more generally, labor market plays an important role in the housing market, especially the tenure of workers, but the opposite direction does not fit in this model. Therefore, homeowners are more likely to try to avoid unemployment from putting more money in job specific capital.

For the simultaneous model, they argued that the effect of genuine duration dependence is overestimated. And they found a strong negative influence of homeownership on the risk of losing jobs. In other words, the risk of unemployment is negatively affected by the homeownership, which is a contrast of Oswald's findings. This finding can be explained by the high likelihood of homeowners to invest in their jobs as they already own houses. Also, in their findings, the higher the reginal homeownership rate, the higher the individual probability of being a homeowner.

Therefore, they came the conclusion that the decision to purchase a housing is significantly affected by job commitment. The relationship between housing market and labor market is one direction, which goes from labor market to housing market. Besides, there is no effect of homeownership on the outflow of the labor force. Since it is more important for homeowners to have income than renters, it is reasonable that there is negative effect of homeownership on the probability of losing jobs. To conclude, there isn't evidence showing the homeownership does not affect labor market mobility at all. However, homeownership do stimulate job commitment with no substantial cost of less job mobility.

For the paper titled Home-ownership and Unemployment in the US, Richard K. Green and Patric H. Hendershott examined Oswald's theory across the US states. From their findings, it shows that the states which have the greatest increase and decrease in unemployment rates, they tend to mitigate the theory introduced by Oswald. On the opposite, for those states with large jump in unemployment rate but minimal rise in ownership or huge jump in unemployment but minimal increase in ownership lower the regression coefficient. It is also shown that the relationship between homeownership and unemployment rate is especially significant for the

whole population than for the household heads individually given that homeownership will probably favorable for the primary workers moving to find jobs than secondary workers.

By separating the total population into three parts, below 35 years old, between 35 and 65 years old and over 65 years old, the results show different trends for those three age classes. For the middle age-class, which range from 35 to 65, homeownership tends to limit the labor mobility, and therefore causing higher unemployment rate. It also shows that for non-household heads, they are more limited by the labor mobility compared with household-heads. Further, as Oswald claimed that every 10-percentage increase in homeownership will drive the unemployment rate up by 2 points, they also find this relationship in their findings. However, this result is contributed by selectivity bias. It is known that the tenure choice is an application of the costs of owning and renting housings.

To talk about the tenure choice model, it takes the role of flow costs of housing into consideration, such as the after-tax costs of maintenance, depreciation and financing. By taking these costs into consideration, people are more likely to be homeowners if they have higher expected lengths of stay. It is then reasonable to assume that households that plan to be mobile are less interested in purchasing housings than those who plan to stay longer. There are probably two main reasons for longer length of stay, one is a satisfied job, and the other is a stable family. Under this assumption, if the homeowner loses job and the only reason left would be a stable household. In this circumstance, the household are less likely to move to other places to find jobs simply because the stable household. That is to say, homeownership itself is not the reason for immobility. For the other circumstance, if the household lose the job and the reason for staying longer is employment. Then, only in this case, the homeownership might result in continued

unemployment. Given that the expectations of the stability of households may fluctuates over time, the changes will decrease the selectivity problem but cannot totally erase it.

In order to eliminate the selectivity bias, they used Heckman's (1979) selectivity correction technique with a family database to measure a two-stage structure model of the effect of tenure on employment. By applying this technique, one of the variables would be the difference between the cost of owning and renting a housing. This variable is found to be exogenous to the household and thus, it causes tenure choice. And then the fitted value can be applied as a variable to better understand the household unemployment. Therefore, the selectivity bias could be taken out of the account.

Wayne J. Howe did a research on the effects of higher education on unemployment rates. In his paper, by analyzing the data, he found that education played an important role in the unemployment rate. He took a deeper look at the twenty-year period from 1968 to 1988. This is the time interval when there is a huge increase in the quantity of students graduated from high school and those who graduated from universities. The main reason behind this is the baby-boom generation after World War II.

His result shows that the less educated people are more vulnerable to the change of unemployment rate compared with the highly educated people. It is shown that as the increase in the overall education level between 1968 and 1988, the labor force is booming. Under this pressure in the labor market, the positions for the high school graduates are shorting and people with higher education are more competitive in the labor markets.

Data

The data that used in this paper are from two resources. The unemployment rate is derived from the United States department of Labor. The other resources are from the IPUMS CPS, which offers census and survey data from all over the world. Since the survey was taken in a family-based unit and many of them continuously responded. It allows researchers to track the changes and development. There are many variables in this paper, such as state, ownership of dwelling, person number in sample unit, relationship to household head, age, sex, educational attainment recodes, and relationship to household head. Among those variables, educational attainment, relationship to household head and sex are comparably more important. Educational attainment is a record of the levels of education one accomplished. This variable was not noticeable in other papers. However, as my focus is on recent graduates, I include this variable to see the difference between those graduates from two-year college or higher and those who graduates from high school or lower. The relationship to household head is essential because it is required to differentiate whether one person is just living in the house or owning the house. For the purpose of this paper, only the heads are included in the analysis. Sex is another important variable as it can look at the gender differences. Table 1 shows the summary of the variables that is included in my analysis.

Chapter 3

Model

In order to examine the relationship between the unemployment rate and the homeownership rate for recent graduates, I control the education variable and set high education as equal or above two-year college degree and the set less education as below two-year college degree. Also, I had a regression for the whole dataset, which includes high and less education. I used the OLS regression and the following is the equation:

$$homeownership\ rate = \alpha\ unemployment\ rate + \beta_1\ education + \beta_2\ sex$$

By setting the education and sex as the dummy variable, it would be straightforward to see the effect of the unemployment on the homeownership rate. The variable sex and education play important roles in the result. To compare the differences between males and females on the relationship between unemployment rate and the homeownership rate, I run two regressions one with female and the other one with male. For the education variable, I separate the education level into two categories. One is high education, which includes people graduated from a two-year college or higher and the other one is less education, which includes people graduated from high school or below.

When looking at the data, it is interesting to see the importance of education variable. Then, I collapse the education, age and homeownership rate. The result will show education is an important factor driving the homeownership rate upward. Also, I analyzed different age cohorts to see if there are some outstanding age cohorts. The result will show how significantly the homeownership rate could be affected by the unemployment rate.

Result

Table 2 is the chart including all the coefficients and constants from the regression in different situations. For situation 1, it is the regression of this model. The coefficient is -0.0091768 and the constant is 0.4384019. As shown in the Graph 1, there is an obvious negative relationship between the unemployment rate and the homeownership rate. The noticeable cluster ranges from 0.2 to 0.6 on the homeownership rate axis. It shows that as the unemployment rate increases, the homeownership rate drops too.

Situation 2 is when only male is included in the dataset. The coefficient is -0.0081323 and the constant is 0.5028413. Situation 3 is the circumstance that only female is analyzed in the dataset and the coefficient is -0.0154248 and the constant is 0.3647458. As shown in the graph 2, the relationship between unemployment rate and ownership of dwelling are both negative. However, there are many differences between the male-only graph and female-only graph. The graph on the left is the male-only graph. The ownership rate ranges roughly from 0.2 to 0.7. On the other hand, the ownership rate for female-only graph ranges from 0 to around 0.5. There is a huge difference between the ownership rate for male and female. This could be explained by the fact that even though the gap between female ownership and male ownership has been lower recently, the dataset includes all the numbers from 1976 to 2017. Therefore, the recent increase in the female homeownership rate has been distilled by the data from earlier years. Also, by comparing the Graph 1 and the male-only graph in the Graph 2, it is interesting that these two graph looks very similar. One of the potential explanations is that the main type of family in the 1980s is male as the family head, and female as the spouse. Therefore, as the data only counts heads for the ownership rate, the graph of male pretty much looks the same as the graph for the whole dataset.

Situation 4 and 5 tells the difference between the high education and less education. Situation 4 shows the relationship for high education between unemployment rate and homeownership rate is negative with coefficient -0.0146566 and constant 0.5223842. Situation 5 illustrates the relationship for less education is also negative, but with coefficient -0.0044794 and constant 0.3649726, which are smaller than that of high education. As shown in the graph 3, the graph on the left shows the relationship for highly educated people with the homeownership rate clustering from 0.2 to 0.7. On the right side, the graph shows the relationship for less educated people with homeownership rate clustering from 0.1 to 0.6. It obvious that at the approximately the same level of unemployment rate, high education drives the whole homeownership rate higher. Another interesting fact about these two graphs is the difference between the slopes. The high education graph has a steeper slope than the less education does. In other words, one-unit increase in the unemployment rate will have a more noticeable decrease for high education compared with less education. However, even though the effects of unemployment rate are more obvious for the highly educated people, the overall homeownership rate is still much higher than the less educated people.

In order to further analyze the importance of education, I collapse the householder, by age and education, drawing a graph showing the how the homeownership rate changes as the age increases. The result is quite outstanding, as shown in graph 4. Highly educated people is defined as those who graduated from two-year college or higher and the other is below two-year college. As shown in the graph, as the age increases, there isn't much difference from age 21 to age 25. However, from 25 years old, there is a significant change for the higher education and less education. Starting from 30 years old, the difference becomes stable and keep at the 0.15

difference in homeownership rate. After age 50, the difference is lower to around 0.1 and stays the approximately the same there after.

Another interesting finding from the data is the difference between the different age cohorts. It is interesting that for people who were born between 1978 and 1982, the relative homeownership rate is higher the other generations. For people born in around 1980s, they reached 20 years old at around 2000, when the unemployment rate drops below 4 percent. In 2000, the unemployment reached 31-year low, which means the economy is booming. Thus, as the unemployment rate is low, it is easier for young people to find jobs. That is to say, young people will have the ability to purchase the housing sooner. Therefore, the homeownership rate is higher than other generations.

Chapter 4

Conclusion

From the findings in the model, it is clear that there is a positive relationship between the unemployment rate and homeownership rate. The main reason that my findings is almost completely different from Oswald's findings is that I constrain the data to younger age with the focus on recent graduates. As Richard K. Green and Patric H. Hendershott argued in their paper that the reason for purchasing housing is mainly either job or family. The location of job determined the housing. Therefore, for recent graduates, they will be more likely to purchase housing in the location where they find jobs. In this way, where the job locates is not very important. On the contrary, the difficulty of finding a job is important as it determines when recent graduates start to earn income.

To conclude, from the regression model, there is a negative relationship between the unemployment rate and homeownership rate. Even though there are some fluctuations from different regression, the negative relationship exists in each graph. Also, there is a noticeable advantage for highly educated people as their homeownership rate is a lot higher than the less educated people.

Works Cited

Bricker, Jesse, and Brian Bucks. “Negative Home Equity, Economic Insecurity, and Household Mobility over the Great Recession.” *Journal of Urban Economics*, Academic Press, 24 Oct. 2015, www.sciencedirect.com/science/article/pii/S0094119015000650.

Green, Richard K., and Patric H. Hendershott. “Home-Ownership and Unemployment in the US.” *Urban Studies*, vol. 38, no. 9, 2001, pp. 1509–1520., doi:10.1080/00420980126669.

Howe, Wayne J. “The Effects of Higher Education on Unemployment Rates.” *SpringerLink*, Springer, Dordrecht, 1 Jan. 1993, link.springer.com/chapter/10.1007/978-94-015-8167-7_6.

Jaffe, Jim. “POVERTY RATES FELL IN 2000 AS UNEMPLOYMENT REACHED 31-YEAR LOW Upturn in Unemployment Combined with Weaknesses in Safety Net Raise Red Flags for 2001.” *Poverty Rates Fell in 2000 as Unemployment Reached 31-Year Low, 9/25/01*, Center on Budget and Policy Priorities, 26 Sept. 2011, www.cbpp.org/archives/9-25-01pov.htm.

Leuvensteijn, Michiel van, and Pierre Koning. “The Effect of Home-Ownership on Labor Mobility in the Netherlands.” *Journal of Urban Economics*, Academic Press, 25 Feb. 2004, www.sciencedirect.com/science/article/pii/S0094119004000026.

Oswald, Andrew. “The Housing Market and Europe's Unemployment: A Non-Technical Paper *.” *Housing Market and Europe's Unemployment: A Non-Technical Paper * - Oxford Scholarship*, Oxford Express, 17 Nov. 2014, www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199543946.001.0001/acprof-9780199543946-chapter-3.

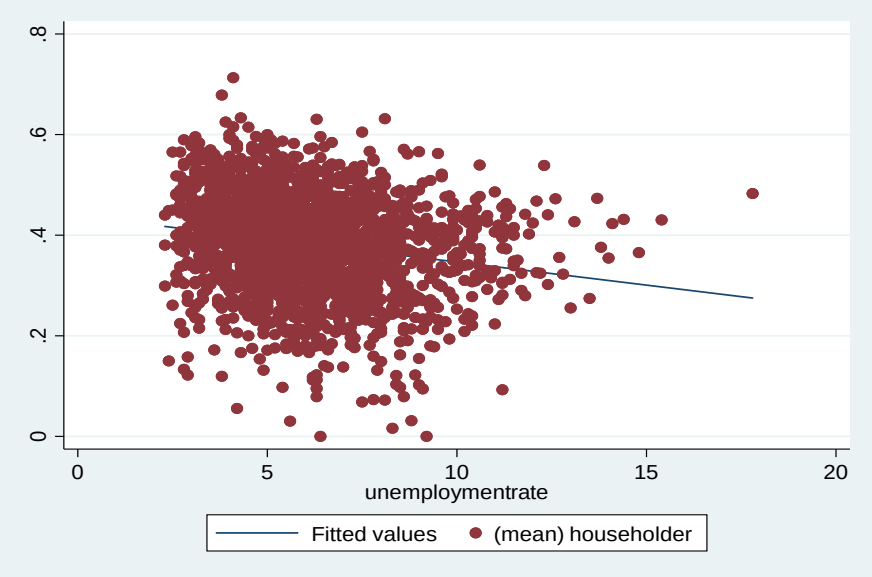
Appendix

Variable	Obs	Mean	Std. Dev.	Min	Max
age	166,835	24.74776	3.193508	14	29
ownershp	166,835	18.04718	5.612286	10	22
relate	166,835	101	0	101	101
statefip	166,835	28.78849	17.18426	1	90
sex	166,835	1.393011	.4884207	1	2
educ	166,835	64.10905	14.92577	2	73
householder	166,835	.3270417	.469134	0	1

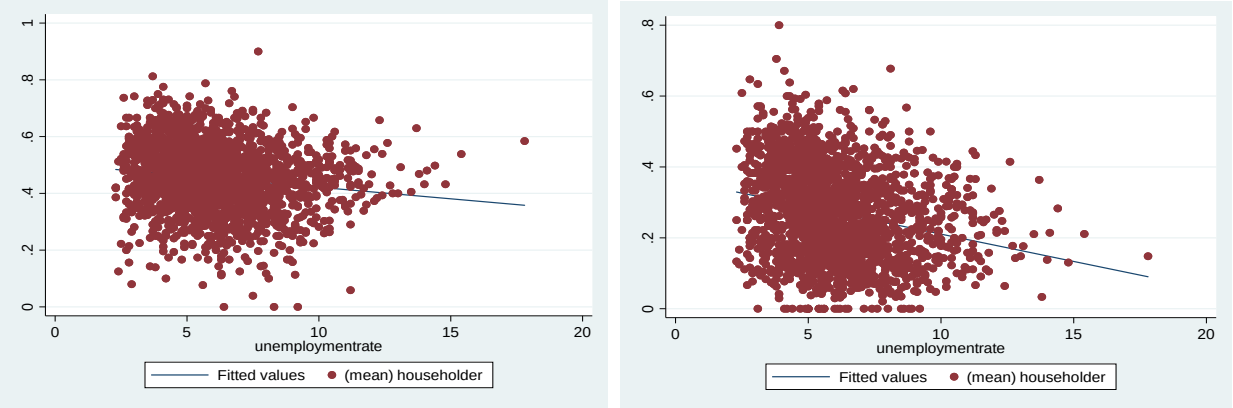
Table 1 shows the variables that are included in this paper. There is age, ownership, relation to the family head, state, sex, education and householder, which is the homeownership rate.

situation	coefficient	constant
situation 1	-0.0091768	0.4384019
situation 2	-0.0081323	0.5028413
situation 3	-0.0154248	0.3647458
situation 4	-0.0146566	0.5223842
situation 5	-0.0044794	0.3649726

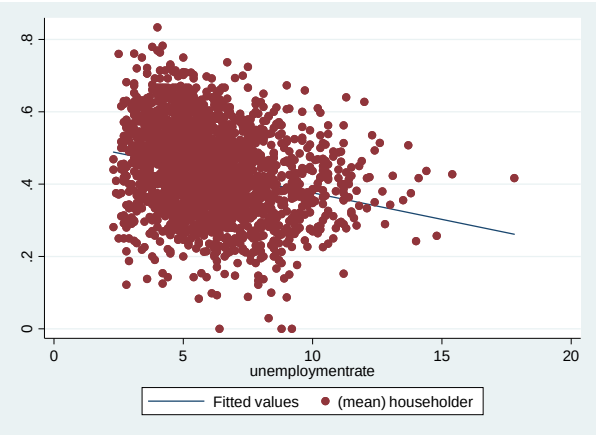
Table 2, this table shows the corresponding coefficients and constants of regressions from different situations. Situation 1 is the original regression. Situation 2 is the regression when there is only male and situation 2 is the regression when there is only female. Situation 4 is the regression when there is only highly educated people, and situation 5 is the regression when there is only less educated people.

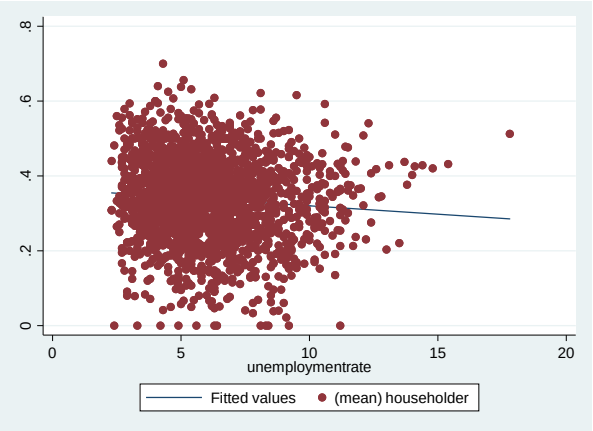


Graph 1 shows the relationship between the unemployment rate and homeownership rate. There is negative relationship between the unemployment rate and the homeownership rate.



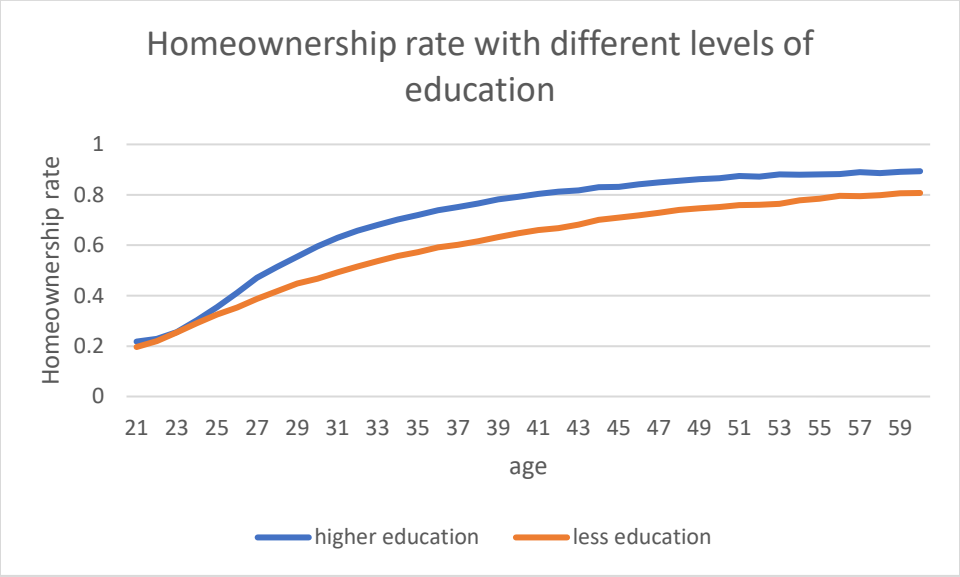
Graph 2 shows the relationship between the unemployment rate and the homeownership rate form female and male individually. The graph on the left is the male-only situation and that on the right is the female-only situation.





Graph 3 shows the relationship between the unemployment rate and homeownership rate for high education and less education separately. The graph on the left shows the situation when there is only highly educated people and the right graph illustrates the relationship when there is only less educated people.

Graph 4 shows the relationship between the age and homeownership rate from age 20 to age 30 for people who born from 1978 to 1982. The homeownership rate ranges from about 0.2 to 0.6.



Graph 5 shows that how the homeownership rate changes as age increases. The blue curve represents the higher education and the orange curve represents the less education.