Bryant University

HONORS THESIS

Disparities Within the Housing Market: Determinants of Homeownership with an Emphasis on Sex and Race

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ABSTRACT

A home is one of the wealthiest assets an individuals can hold and serves as a major indicator of economic wellbeing. The decision for someone to rent or buy a home is based upon many factors. Similar, to Hood (1999), this paper analyzes the relationship between determinants of homeownership and the probability that an individual owns their home using regression and probability models. The focus of this paper is the relationship between sex and race on homeownership. Results suggest that White males have the highest rate of homeownership, while Black females have the lowest rate of homeownership even after all controls are accounted for in the analysis.

INTRODUCTION

The housing market represents the channel in which homes are bought and sold. The housing market is different from other economic markets as housing satisfies the basic human need of shelter. Homeownership is also a major indicator of economic wellbeing at the market level and at the household level. Many Americans view homeownership as one of the basic elements of satisfactory middle-class life. There is much investment value associated with homeownership, while home equity is the largest investment for many families. Over the life of mortgages, they provide a means to accumulate savings in real property. Homeownership also encourages economic growth through the means of building and construction. Homeownership has historically served as a vehicle for wealth accumulation, as homes tend to increase in value over time.

The United States does not rank high among high income countries when it comes to homeownership and are among the countries with declining rates of homeownership (Goodman & Mayer, 2018). Historically median home prices in the United States have been 2.5 to 4 times median income. Americans rely on housing wealth to pay for their children's education and/or to supplement retirement savings. Median wealth of all homeowners in 2013 was $195,500 including $80,000 of home equity. However White homeowners have much greater wealth than their Black counterparts. In the United States, the median income for Black households is $38,183, while the median income for White households is $61,363

(Choi, 2020). And in 2015, 70.8% of White Americans owned a home while, Black (42.2%), and Asian (56.6%), all fell much shorter. Goodman and Mayer (2018) also note that renters have little net worth at just $5,400. Homeownership is also cited a vehicle for economic growth as every new home creates 2.1 jobs through construction. Barker and Miller (2005) discuss that homeownership also has benefits for children. Their analysis of PSID data examines that at an average level of income, children of homeowners are 3% to 4% more likely than children of renters to be enrolled in school at 17. This increase in education can provide an increase in wealth as data from The United States Bureau of Labor Statistics reports that individuals with a High School Diploma earned $827 a week in the first quarter of 2022, as compared to individuals with a bachelor's degree or higher that earned $1,525 per week (U.S. Bureau of Labor Statistics, 2022). By 2015, there was about a 23-percentage point difference in the home ownership rates of the most and least educated households (Goodman & Mayer, 2015). Homeownership rates also increase with age and peaks during retirement after 65. US homeownership rates rose from 63.5 percent in 1985 to 65 percent in 1995 and peaked at 68.8 percent in 2005. Homeownership then dropped to 62.7 percent in 2015 (Goodman & Mayer, 2015). The literature review that follows will analyze past studies that focused on disparities within the housing market and the factors that determine whether an individual can purchase a home.

LITERATURE REVIEW

Previous literature suggests that the decision for someone to rent or buy a home is influenced by multiple factors such as sex, race, other demographics, and location and macroeconomic factors. Gandelman's (2005) study uses probability models to analyze four categories of variables of interest. These categories include income, lifecycle status, location, and neighborhood attributes and other socioeconomic characteristics. The results of Gandelman's models conclude that female heads of household are less likely to own a home than male heads of household. Since the probability of homeownership for women is lower than that of males, the higher the income of the woman in the house, the lower the rate of homeownership. Men are also more likely to stay in the work force and gain more experience, likely increasing income. With more certain income, men are more likely to qualify for a mortgage. The race

constraint is associated with the increasing cost of housing and the inability of minority households to meet the wealth constraint, due to the lack of intergenerational wealth transfers (inheritance). Similar, Choi (2020) examines the factors behind the racial homeownership gap and quantifies how major factors contribute to the Black-White homeownership gap (Choi, 2020). These factors include income, marital status, education, while this paper solely examines the income gap. Choi (2020) mentions that this income gap contributes to a homeownership gap, while also possibly being explained by differences in wealth and parental support. While Choi (2020) and Goodman and Mayer (2018) discuss slightly different factors contributing to homeownership, both studies come to similar conclusions. They conclude that People of Color have considerably lower homeownership rates than their White counterparts. Delgadillo's (2009) research also supports this conclusion and mentions that White males with children are the most likely group of individuals to own a home. Schuetz (2019) mentions that wealth gains from homeownership vary greatly across races. The decision to purchase a home is also influenced by both an individual's demographics and family characteristics (Hood, 1999). Hood (1999) uses multiple socioeconomic and financial factors to determine whether someone own's a home. These factors include family income, race, gender, educational attainment, parental home ownership, age, marital status, and family size. Using these factors, Hood (1999) applies the human capital investment theory. This theory is based upon the idea that any activity that increases the productivity of labor should be considered investment in human capital and the model for homeownership is like that of human capital. There are costs and benefits associated with the homeownership model and a rational homebuyer compares these before deciding on their purchase (Hood, 1999). In application of the human capital investment theory, age, marital status, and family size fall into net benefits, while family income and parental home ownership may affect both constraints and benefits.

Net benefits are explained as the flow of services obtained through home ownership such as shelter, warmth, plenty of living place and future equity considering the associated costs. The cost of homeownership relates to the factors such as mortgage and insurance and utility payments, property taxes and maintenance costs. Hood (2005) concludes that given the cost of homeownership, high income families are more likely to own a home. However, the benefits

of homeownership suggest that large families have a higher need for homeownership. The cost of homeownership is also referred to as risk. Some of the risks associated with homeownership include unexpected value depreciation or a catastrophic loss. Delgadillo (2009) discusses the unexpected costs that come with emergency repairs, another risk of purchasing a home. Individuals must factor in these unexpected costs when creating a home buying budget. Similarly, Schuetz (2019), references the risks associated with homeownership. There may be an initial wealth increase due to the investment, but these gains are not guaranteed over the life of the ownership.

Bond and Eriksen (2019) constructed a matched panel of adult children aged between 21 and 49 years of age and their parents. Their study determined if they are potentially correlated with their children's attributes and ownership decisions. Bond and Eriksen (2019) conclude that there is a strong relationship between parental homeownership and a child's participation in the housing market. Hood's (1999) analysis dives deeper into each factor. Expenditures on education and training are understood as an investment in human capital, like expenditures in housing may be treated as an investment in housing capital. In terms of investment, it is importantly noted that equity is only associated with homeownership, and not rental. More highly educated people understand the implications of homeownership better than those who are less educated, making them more likely to buy a home and be able to pay for it. Age is also a major determinant of homeownership, as older households have more certainty of income. Older households are less mobile as they tend to relocate less than younger households (Hood, 1999).

Married couples are often interested in settling down, making them less mobile than unmarried individuals. Married couples also pool their income and wealth (Hood, 1999). If married people forecast raising kids, they prefer a stable environment, more likely purchasing a home. There is a 20% increase in the probability of purchasing a home for households with children compared to those without children. An increasing number of children yields a greater need for homeownership, but only up until 4 people. After this point, increases in family size have no effect on homeownership. (Gyourko & Linneman, 1996)

As mentioned by Hood (2005), a parents economic and homeownership situation is very important for a child's future, especially along the lines of purchasing a home. Net family

income has a direct and indirect influence. Directly related as the net income rises within a family, the opportunity for home ownership also rises. Indirectly related because as income rises, the relative cost of homeownership decreases. And lastly, parental homeownership as children often look to their parents as financial examples. Parents who own homes often have a certain level of wealth which creates intergenerational transfers for their children (Hood, 2005).

Goodman and Mayer (2018) question whether homeownership should be a part of the American Dream. The United States does not rank high among high income countries when it comes to homeownership rates. Goodman and Mayer (2018) conclude that homeownership is a valuable institution and allows families to build wealth and serve as a measure of financial security. Similarly, Di, et al., (2003) mention the benefits of homeownership including savings and wealth. Riley and Quercia (2011) explain that responsible home ownership does build wealth, even when the housing market is in a recession. Barker and Miller (2005) also discuss the benefits of homeownership but specifically for children. Their study suggests tax incentives to promote homeownership as homeownership produces positive externalities, such as higher levels of child welfare (Barker & Miller, 2005). Goodman and Mayer's (2018) finding are consistent with Barker and Miller (2005) as it is expected that people with higher levels of education are more likely to own a home.

Like Hood (2005), Delgadillo (2009) discusses the important of wealth and income constraints and their adverse effect on homeownership. The variables used in Delgadillo's (2009) study include homeownership percentage, which is the portion of households that are owner-occupied, socioeconomic index, market factors, and affordability ratio. Socioeconomic index is composed of housing tenure, poverty score, educational attainment, employment score, and number of children living in the household. Market factors are defined in two variables as the median value of owner-occupied housing units and an affordability ratio. The affordability ratio is median household income divided by median value of a home. There was a positive correlation between homeownership and socioeconomic index, indication that as socioeconomic index values increased, homeownership percentage also increased. The correlation between homeownership percentage and the affordability ratio was positive, indicating that homeownership increases as affordability ratio increases. Delgadillo (2009)

explains that these statistical findings are consistent with the literature that states that housing affordability is positively related to housing tenure. Delgadillo (2009) also concludes that individuals of lower education are more likely to experience delays in homeownership as opposed to individuals with higher education statuses. Another constraint mentioned by Bond and Eriksen (2019), is the down payment constraint, as prior to 2005, the more down payment someone could pay, the greater decrease in the cost of borrowing. Ding, et al. (2011) explain that low wealth home buyers have no greater risk of default than higher-wealth individuals, constant that low-wealth purchasers hold prime rate mortgage with conventional terms. Household income also varies by sexual orientation of a couple. Gay male couples have the highest average household incomes, heterosexual couples have the second highest, and lesbians have the third highest income. Same-sex couples have higher levels of education than heterosexual couples (Jepsen & Jepsen, 2009). Akpandjar (2015), explains two perspectives which are often used to explain the role that marriage plays in the homeownership decision. Sociological theory suggests that there are several attributes that may make home ownership more likely among married couples than among unmarried couples. Married couples may be less likely to feel like their lives are transitions quickly, therefore making them more likely to make a longer lasting homeownership decision. Married couples are more likely to commit to purchasing a home that they stay in for a longer time. People generally strive to purchase a home but tend to wait to achieve financial and family stability before making that purchase. An economic perspective suggests that in terms of financial security, married couples are more apt to buy a home than single people (Hendershott, et.al, 2009). Married couples tend to have greater financial capability than singles. Married couples can often benefit from economies of scale by sharing expenses and purchasing goods and services (Grinstein-Weiss, et.al, 2006).

Homeownership also provides a means to growth and development. Like Barker and Miller (2005), Delgadillo (2009) encourages homeownership as a vehicle for growth, as they explain more households' own homes than they do participate in the stock market (66% versus 48.8%). This study notes that an increase in population precedes an increase in homes. It is possible that overpopulated communities are more likely to have a shortage of housing at all levels of income. According to Schuetz (2019), homeownership offers some financial benefits

over renting. Homeowners that obtain a mortgage are accruing debt while also gaining equity with each payment made. "By contrast, rent payments only cover the consumption value of housing and do not accumulate savings." (Schuetz, 2019, p.3) Owning a home also provides greater stability and predictability of housing expenditures than renting. It is also recognized that for most of the time that an individual is paying a mortgage, that those payments are fixed, usually for periods of time around 30 years. For renters, they also know the fixed cost associated with the rent during the duration of the lease, usually only around a period of 1 year. The predictability of ownership translates into greater housing stability for owners as opposed to that of renters. Schuetz (2019) also mentions, wealth gains from homeownership vary greatly over geographic regions.

Oswald's (1997) study found that there is a positive correlation between homeownership and unemployment. As rises in the homeownership rate in a certain state is a precursor to a sharp rise in the unemployment rate of that state. Akpandjar (2015), recalls Oswald's study accredits the positive correlation to the immobility of homeowners. An analysis done by Green and Hendershott (2000) has partially disproven Oswald's findings. Oswald's argument states that homeowners are less mobile than renters when they become unemployed due to factors including the lump-sum costs associated with buying, financing, and eventually selling a house. Green and Hendershott (2000) argue that Oswald's positive relationship between homeownership and unemployment is surprising given what is known about how these variables correlate with age and how populations have aged since 1960. Older individuals have both higher rates of homeownership as well as lower unemployment rates than younger individuals. Therefore, states and countries with older populations are likely to have both higher ownership rates and lower unemployment rates. Green and Hendershott (2000) also mention that are disparities between the effect of unemployment on the household head, versus non-heads of household. When the highest earner in the household becomes unemployed, being an owner is less likely to discourage movement to a new location, as not moving can be too costly. Contrastingly, when the secondary earner becomes unemployed the costs of not moving are not as large. It can be concluded that the effect of homeownership on the unemployment rate is greater for non-heads of household. The five states with the highest ownership rates are less urban than the national average and less mobile. Areas with the

lowest ownership rates tend to be more urban (Green and Hendershott, 2000). Per Desmond and Gershenson (2016), in the private rental market, where most low-income families live, affordable housing has dissipated. Low-income workers find themselves in a situation where both their jobs and their housing are on shaky ground (Desmond & Gershenson, 2016). Like Green and Henderscott (2000), Desmond and Gershenson (2016) agree that one is less likely to move when a job loss occurs when their income is higher. Job loss may bring about forced removal from housing. Desmond and Gerhenson (2016) mention that Lerbs (2011) study finds a negative relationship between homeownership and unemployment. When regional heterogeneity is accounted for, this relationship becomes positive, which supports Oswald's findings. It is explained that within the studies limitations, spatial dependence among regional labor markets should be studied. As Lerbs (2011) may accredit the findings to this conclusion. As discussed, owning a home is a large part of many Americans lives and something that many people hope to accomplish. Although the literature analyzed have different research goals and variables, it can be concluded that there are many factors that affect homeownership. Such as sex and race, income, marital status, children, education status, and employment status.

DATA

To examine the relationship between homeownership and sex and race, other demographic variables, macroeconomic variables, a sample population was obtained from Integrated Public Use Microdata Series (IPUMS). IPUMS provides United States census data for social, economic, and health research. The data has been cleaned to 66,849 participants from the years 2010 to 2019.

Table 1 presents summary statistics for the dependent variable of interest, Homeownership as well as the independent variables of interest, Sex and Race. Summary statistics for controls are also included in Table 1. For all individual level controls, dummy variables were created given either a 1 or a 0, explaining why all means as well as standard deviations are between 0 and 1.

Table 1: Summary Statistics

Variable	Description	Mean	Standard Deviation
Dependent Variables			
Homeownership	Dummy variable = 1 if they own their home. = 0 if they rent it.	0.7528	0.4313428
Independent Variables			
Sex			
Female	Dummy variables = 1 if the individuals identify as female. 0 otherwise	0.4546	0.4979
Male	Dummy variables = 1 if the individual identifies as male. 0 otherwise	0.5454	0.4979
Race			
White	Dummy race variable =1 if White. 0 otherwise	0.8115	0.3911
Black	Dummy race variable =1 if Black. 0 otherwise	0.0907	0.2872
Asian	Dummy race variable =1 if Asian. 0 otherwise	0.04577	0.2089
Other	Dummy race variable =1 if Other race. 0 otherwise	0.0519	0.2219
Age	Age of participants in data	49.92	14.1258
Marital Status			
Married	Dummy marital status variable = 1 if married. 0 otherwise	0.6199	0.4854
Separated/Divorced	Dummy marital status variable = 1 if separated or divorced. 0 otherwise	0.1744	0.3794
Single	Dummy marital status variable = 1 if single. 0 otherwise	0.2056	0.4041
Education Level			
College	Dummy education variable = 1 if obtained college education. 0 otherwise	0.2273	0.4191
Highschool	Dummy education variable = 1 if obtained high school education. 0 otherwise	0.3189	0.4660
More College	Dummy education variable = 1 if obtained greater than a college education. 0 otherwise	0.1572	0.3639
No Highschool	Dummy education variable = 1 if they did not obtain high school degree. 0 otherwise	0.0508	0.2197
Some college	Dummy education variable = 1 if they attended some college. 0 otherwise	0.2455	0.4304
Real Income	Generated a real income variable by taking inctot and multiplying it by CPI/Base CPI	$65,694.36	$79,802.62

Children	Number of children an individual has	0.8044099	1.11206
Employment Status			
Employed	Dummy employment status variable =1 if employed. 0 otherwise	0.8051	0.3960
Unemployed	Dummy employment status variable =1 if unemployed. 0 otherwise	0.0360	0.1863
Not in Labor Force	Dummy employment status variable =1 if not in labor force. 0 otherwise	0.1588	0.3655
Independent Living			
No Independent Living Difficulty	Dummy living status variable = 1 if individual has no difficulty living independently. 0 otherwise	0.9802	0.1392
Has Independent Living Difficulty	Dummy living status variable = 1 if individual has difficulty living independently. 0 otherwise	0.0197	0.1392
Occupation			
Computer, Engineering, and Science Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0666	.2494
Construction and Extraction Occupation	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0011	.0339
Education, Legal, Community Service, Arts and Media Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.1183	.3229
Farming, Fishing and Forestry Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0075	.0863
Healthcare Practitioners and Technical Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0604	.2382
Installation, Maintenance, and Repair Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0347	.1831
Management, Business, and Financial Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.1792	.3835
Office and Administration Support Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.1255	.3313
Production Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0604	.2383

Sales and Related Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0925	.2898
Service Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.1251	.3309
Transportation and Material Moving Occupations	Given a 1 if an individual has a certain occupation. 0 if otherwise.	.0667	.2495
Industry			
Accommodation and Food Services	Given a 1 if the individual works in the industry. 0 if otherwise.	.0376	.1902
Active Duty Military	Given a 1 if the individual works in the industry. 0 if otherwise.	.0097	.0985
Administrative and Support	Given a 1 if the individual works in the industry. 0 if otherwise.	.0355	.1852
Arts and Entertainment	Given a 1 if the individual works in the industry. 0 if otherwise.	.0197	.1390
Construction	Given a 1 if the individual works in the industry. 0 if otherwise.	.0609	.2392
Educational Services	Given a 1 if the individual works in the industry. 0 if otherwise.	.1048	.3063
Finance and Insurance	Given a 1 if the individual works in the industry. 0 if otherwise.	.0289	.1675
Healthcare and Social Assistance	Given a 1 if the individual works in the industry. 0 if otherwise.	.1334	.3400
Information	Given a 1 if the individual works in the industry. 0 if otherwise.	.0194	.1380
Management of companies and enterprises	Given a 1 if the individual works in the industry. 0 if otherwise.	.0011	.0341
Manufacturing	Given a 1 if the individual works in the industry. 0 if otherwise.	.1171	.3216
Mining, Quarrying, and Oil and Gas Extraction	Given a 1 if the individual works in the industry. 0 if otherwise.	.0074	.0861
Other Services	Given a 1 if the individual works in the industry. 0 if otherwise.	.0466	.2109
Professional, Scientific, and Technical Services	Given a 1 if the individual works in the industry. 0 if otherwise.	.0770	.2666
Public Administration	Given a 1 if the individual works in the industry. 0 if otherwise.	.0640	.2448
Real Estate and Rental and Leasing	Given a 1 if the individual works in the industry. 0 if otherwise.	.0208	.1429

Retail Trade	Given a 1 if the individual works in the industry. 0 if otherwise.	.0914	.2881
Transportation And Warehousing	Given a 1 if the individual works in the industry. 0 if otherwise.	.0447	.2066
Utilities	Given a 1 if the individual works in the industry. 0 if otherwise.	.0122	.1102
Wholesale Trade	Given a 1 if the individual works in the industry. 0 if otherwise.	.0269	.1619
Unemployment	Percentage of state unemployment	5.905994	2.265995
Housing Price Index	Price change of residential housing based on a percentage of an HPI of 100.	219.4212	49.94
Observations	66,849		

Within each variable mentioned there are 5 or less subcategories (besides Industry and Occupation) It is important to note that only the head of the household will be analyzed in this model to avoid double counting individuals who jointly own or rent a home. The mean of homeownership in the data is .7528, which is greater than the national average because as mentioned previously, only heads of household are analyzed. The two sex variables are Female and Male. There are more male participants than females in this study as the means are .54 and .45 respectively. It is important to note that there are more men than women in this data set and the average age of participants is about 49 years. Race is represented in 4 categories including White, Black, Asian, and Other. These race categories were created from a broader list of races. The White race variable includes individuals who identify as White. The Black race variable includes individuals who identify as African American or Black. The Asian race variable includes individuals who identify as Chinese, Japanese, Pacific Islander, other Race Asian. Lastly, the Other race variable includes individuals who identify as Native American, Alaskan Native, "Other race," two races, three or more races. Based on the means of these races that most of the participants in this dataset identify as White (81%). As well as round 10% Black, 4.5% Asian, and 5.1% Other. 80% of participants are employed with an average income of $65,694.36 yearly. More than half of the participants in this data are married with the remaining either being divorced/separated or single. The independent living status variables determines if any individuals in the data have difficulty living on their own. The mean of no independent living is .98 determining that most, not all, have no difficulty living independently.

Table 1 presents rates of homeownership based on the two sex variables, Male and Female.

Table 2: Sex and Rates of Homeownership

Sex	Rate of Homeownership
Male	78.1%
Female	71.8%

The results of Table 2 conclude that consistent with the literature, men have a higher rate of homeownership than women.

Table 3 presents the relationship of the four race variables: White, Black, Asian, and Other, and homeownership.

Table 3: Race and Rates of Homeownership

Race	Rate of Homeownership
White	78.6%
Black	57.4%
Asian	71.5%
Other	57.7%

Table 3 concludes that White individuals have the highest rate of homeownership (78.6%), followed by Asian individuals (71.5%), lastly Other race individuals and Black individuals have the lowest rates of homeownership at 57.7% and 57.4% respectively.

Table 4 represents rates of homeownership across race and sex. The variables were created to represent combinations of race and sex. Percentages of homeownership across these variables was then calculated and is shown in the table below.

Table 4- Homeownership Rates across Race and Sex

Race/Sex	Homeownership
White Male	80%
White Female	76%
Black Male	63%
Black Female	54%
Asian Male	72%
Asian Female	70%
Other Race Female	54%
Other Race Male	60%

METHODOLOGY

To determine the strength of the relationships between sex and race and other key variables on the probability of homeownership, a series of probability models are estimated. Each model is presented below in Table 5.

Table 5: Probability Models

Model	Equation
1	$Homeownership_i = \beta 0 + \beta 1 Female_i + \varepsilon_i$
2	$Homeownership_i = \beta 0 + \beta 1 White_i + \beta 2 Black_i + \beta 3 Asian \beta_i + \varepsilon_i$
3	$Homeownership_i = B0 + \beta 1 Female_i + B2 White_i + \beta 3 Black_i + \beta 4 Asian_i + \varepsilon_i$
4	$Homeownership_i = B0 + \beta 1 WhiteFemale_i + \beta 2 WhiteMale_i + B3 BlackFemale_i + \beta 4 BlackMale_i + \beta 5 AsianMale_i + \beta 6 AsianFemale_i + \beta 7 OtherFemale_i + \varepsilon_i$
5	$Homeownership_i = B0 + \beta 1 WhiteFemale_1 + \beta 2 WhiteMale_i + B3 BlackFemale_i + \beta 4 BlackMale_i + \beta 5 AsianMale_i + \beta 6 AsianFemale_i + \beta 7 OtherFemale_i + \beta 8 Age_i + \beta 9 Income_i + \beta 10 Children_i + \beta 11 MaritalStatus_i + \beta 12 Education_i + \beta 13 EmploymentStatus_i + \beta 14 IndependentLiving_i + \beta 15 Occupation_i + \beta 16 Industry_i + \varepsilon_i$

A probability model regression is a model in which the dependent variable can only take one of two values. The variables explored are going to include an emphasis on race and sex as well as age, income, marital status of the head of the household, number of children, level of education, employment status, independent living status, occupation, and industry. Throughout the regression analysis the models will build upon themselves and include

multiple variables. After each model is created, they will be analyzed to determine the strength of the relationships and which variables have the greatest impact on homeownership. This methodology was chosen as it incorporates many factors as possible determinants of homeownership. It is also important that the dependent value can only take one of two values as the most important factor is determining what causes an individual to rent or buy a home. The data analysis will provide who may be the least likely to own a home based on certain characteristics. Model 1 is an analysis of the relationship between homeownership and sex only. Model 2 is an analysis of the relationship between homeownership and race only. This model does not include sex and is used to examine the difference in predicted probabilities of homeownership between White, Black, Asian and Other race individuals. In this model, race Other is the comparison variable. Model 3 adds sex back into the regression while continuing to account for race. Model 4 introduces the combined race and sex variables that were created. This model uses Other race male as the comparison. Lastly, model 5 continues to use the combined race and sex variables while also including the control variables. The controls are included to explore whether predicted probability of homeownership across various races and sexes, changes due to controls.

RESULTS

Results of the estimations are presented in Table 6. Results of Model 1 are presented in column 1 represents solely considering the relationship between homeownership and sex, with the omitted category being males. Column 2 presents the results of Model 2, which accounts for races, regardless of Sex. Column 3 represents Model 3, where sex is included again as well as White, Black, Asian, and other is the comparison variable. Column 4 presents Model 4, which is the introduction of the combined race and sex variables. The comparison variable in this model is Other race males. Lasty, column 5 presents model 5 which includes the combined race and sex variables as well as all the controls. Other race males remain the comparison variable in this model. All coefficients are the estimated marginal values for each variable.

Table 6: Regression Output

Independent Variables	1	2	3	4	5
Sex					
Females	-0.0617*** (0.0033)		-0.0514*** (0.0036)		
Race					
White		0.0184*** (0.0067)	0.1835*** (0.0067)		
Black		-0.0020 (0.0082)	0.0057 (0.0082)		
Asian		0.1153*** (0.0098)	0.1103*** (0.0098)		
Combined Race and Sex					
WhiteMale				0.1851*** (0.0092)	0.0925*** (0.0084)
WhiteFemale				0.1345*** (0.0093)	0.1095*** (0.0086)
BlackFemale				-0.0525*** (0.0109)	-0.0092 (0.0109)
BlackMale				0.0220 (0.0120)	-0.0099 (0.0109)
AsianMale				0.1008*** (0.0129)	0.0099 (0.0118)
AsianFemale				0.0801*** (0.0150)	0.0601*** (0.0136)
OtherFemale				-0.0470*** (0.0131)	0.0163 (0.0119)
Age					0.0082*** (0.0001)
Children					0.0045** (0.0014)
Total Income					5.19e-07*** (3.16e-08)
Marital Status					
Married					0.1635*** (0.0037)
Divorced/Separated					-0.0047 (0.0045)

Education					
College					0.0241***
					(0.0045)
Highschool					-0.0241***
					(0.0040)
More College					0.0200***
					(0.0056)
No Highschool					-0.3261***
					(0.0273)
Employment Status					
Employed					0.0433**
					(0.0185)
Unemployed					-0.0701**
					(0.0176)
Independent Living					
No Independent Living Difficulty					0.2380***
					(0.0400)
Occupation					
Computer, Engineering, and Science Occupations					0.0710*
					(0.0392)
Construction and Extraction Occupation					0.0710
					(0.1735)
Education, Legal, Community Service, Arts and Media Occupations					-0.0967**
					(0.0366)
Farming, Fishing and Forestry Occupations					-0.2441***
					(0.0723)
Healthcare Practitioners and Technical Occupations					0.1940***
					(0.0402)
Installation, Maintenance, and Repair Occupations					0.1874***
					(0.0429)
Management, Business, and Financial Occupations					0.0900**
					(0.0339)
Office and Administration Support Occupations					0.0196
					(0.0339)
Production Occupations					0.0741*
					(0.0400)
Sales and Related Occupations					0.0109
					(0.0378)
Service Occupations					-0.0594*
					(0.0341)

Transportation and Material Moving Occupations					-0.0594 (0.0341)
Industry					
Accommodation and Food Services					-0.2855*** (0.0387)
Active-Duty Military					-0.5078*** (0.0612)
Administrative and Support					-0.0745* (0.0392)
Arts and Entertainment					0.0606 (0.0489)
Construction					0.1267*** (0.0396)
Educational Services					0.1986*** (0.0346)
Finance and Insurance					0.0898** (0.0436)
Healthcare and Social Assistance					-0.0445 (0.0324)
Information					-0.0421 (0.0484)
Management of companies and enterprises					0.1563 (0.1817)
Manufacturing					0.1751*** (0.0330)
Mining, Quarrying, and Oil and Gas Extraction					0.3062*** (0.0774)
Other Services					-0.0925** (0.0370)
Professional, Scientific, and Technical Services					0.0249 (0.0342)
Public Administration					0.2457*** (0.0357)
Real Estate and Rental and Leasing					-0.0552* (0.0325)
Retail Trade					-.1085* (.0391)
Transportation And Warehousing					0.0777** (0.0396)
Utilities					0.5030*** (0.0691)

Wholesale Trade					0.0742* (0.0443)
Controls	No	No	No	No	Yes
Observations	66,849	66,849	66,849	66,849	66,849
Pseudo R-Squared	0.0000	0.0000	0.0000	0.0000	0.0000
Prob > chi2	0.0046	0.0240	0.0272	0.0273	0.1818

When the results of Model 1 are analyzed, it is concluded that looking at the relationship between homeownership and solely sex, there is significance at the 1% level between the two variables. As males are the omitted variable in this model, it is shown with the negative marginal value (-0.0617) of the female variable, that females are less likely to own a home than males. Model 2 solely analyses the relationship between race and homeownership. There is significance at the 1% level between White individuals and Other race individuals as well as Asian individuals and Other race individuals. The positive marginal values of both the White and Asian race variables suggest that likelihood of homeownership of White and Asian identified individuals is higher compared to Other race individuals. It is also important to note that if this model was run using Black as the comparison variable, that it would most likely yield significance between White and Black as well as Asian and Black. This would suggest that White individuals are the most likely to own a home, then followed by Asian individuals and then there is little to no difference between Black and Other race individuals. Model 3 analyzes the relationship between Sex as well as the four race variables (White, Black, Asian, Other (the comparison variable)). Sex maintains its statistical significance at the 1% level as well as the negative marginal value, indicating that compared to males (omitted variable), females have a decreased likelihood of ownership. Consistent with the significance of Model 2, White and Asian race variables maintain their significance at the 1% level. These variables also maintain their positive marginal values, concluding that their likelihood of ownership increases compared to Other race with White individuals having the highest probability of ownership of all four races. Model 4 includes combined race and sex variables. The categories of this variable include White Males, White Females, Black Males, Black Females, Asian

Males, Asian Females, Other race Females, Other race Male. The comparison variable in this model is Other race Males. The model yields significance at the 1% level between White Females, White Males, Black Females, Asian Females, Asian Males, Other race Females, and Other Race Males. White Males and Females as well as Asian Males and Females have positive marginal values indicating that compared to Other race Males, individuals that identify as these races have an increased likelihood of homeownership. White Males have the largest marginal value (.1851) which explains that all other race and sex combinations compared to Other race Males, White males have the highest likelihood of ownership. White Females have a marginal value of .1345 which is less than that of White Males, but greater than that of Asian Males (0.1008), and Asian Females (0.0801), who also maintain the positive marginal value. There is significance at the 1% level between Other race Males and Other race Females as well Black Females and these variables hold negative marginal values. The negative marginal value of Black Females (-0.0525) is greater than that of Other race Females (-0.0470), concluding that Black Females have the least likelihood of homeownership. Model 5 maintains the use of the combined race and sex variables while also controlling for age, income, children, marital status, education status, independent living status, occupation, and industry. When the results are analyzed, significance is lost across some of the variables. Significance at the 1% level as well as the positive marginal value remains between White Males (0.0925), White Females (0.1095), and Asian Females (0.0601). This explains that regardless of controls individuals in these groups have a higher likelihood of ownership as compared to Other race Males.

CONCLUSION

Based on the results of the models presented above, men are more likely than women to own a home. White men have the highest rate of ownership compared to other race and sex combinations, while Black women have the lowest rate of ownership. Even with controls included White men maintain the highest level of ownership.

LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

There are some limitations that exist within this study. If the data set was larger and/or included a more even spread across races, my results may be stronger. It would have also been interesting as well as beneficial to examine rates of homeownership in specific regions of the country. It may be true that the disparities that I found in my dataset are even more prevalent in certain regions of the country.

Historically housing programs have increased homeownership rates for non-White individuals. Per The U.S Department of Housing and Urban Development these policies have not tackled: the knowledge gap, the trust gap, the market gap, and the resource gap(*Closing the African American Homeownership Gap | HUD USER. 2021).* The knowledge gap manifests itself as misconceptions regarding the requirements of homeownership. "Many [individuals] believe that they need a perfect credit score or a 20 percent down payment to obtain a mortgage" (*Closing the African American Homeownership Gap | HUD USER. 2021, p.2).* This has deterred individuals from participating in homeownership. The trust gap is historic exploitation specifically of Black Americans. This has prevented Black individuals from obtaining affordable as well as sustainable mortgages. The market gap is driven by supply and demand in the housing market and correct housing price that results in investment as opposed to disinvestment. The resource gap involved the low usage of tools available to both buyers and sellers. This includes real estate agents and closing cost assistance programs. (HUD, 2021)

The National Association of Realtors discusses the importance of homeownership education. Homeownership education is a process resulting in a potential buyer's ability to demonstrate understanding of preparing for homeownership, budgeting, and credit management, financing a home, the loan process and timing, selecting a home, maintaining a home and finances, and avoiding delinquency and foreclosure. Education on these topics is offered in formal classes taught in a group setting. Participating in a class like this can help buyers be better versed in the purchase they are making. (Homeownership education and counseling, 2022)

According to Louie (2016), Community Land Trusts come out of a tradition that is rooted in movements for social justice and fairness. Today, Community Land Trusts are used to protect housing affordability. There are currently 225 community land trusts in the United States. The

specific characteristics of a CLT include dual ownership, leased land, perpetual affordability, and perpetual responsibly. In terms of dual ownership, the trust owns the land, allowing the community to use it, while the structures are owned by families, associations, etc. the trust leases the land to the structure owners through a long-term lease. To maintain affordability, the land trust caps the resale price of homes and requires they only be sold to eligible buyers, in terms of income. CLT's are committed to the community while maintaining stake in homeowners' success. Homeowners in these communities receive the benefits of traditional homeownership as they build equity though a down payment as well as their mortgage payments. Owners are protected for potential market downturns as mortgages must be approved by the CLT, protecting individuals against predatory lenders. The community land trusts balance the interest of its residents, the broader community, and the public interest to promote wealth building, retention of public resources, and solutions for community needs.

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