Analyzing the Homeownership Gap Between Different Race/Ethnic Groups in California

A Culminating Project Presented to the Department of Public Policy and Administration
at California State University, Sacramento in Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE IN URBAN LAND DEVELOPMENT

By Alena Rybachuk

May 2023

Advisor: Robert Wassmer, PhD

Executive Summary

While most Americans prefer owning a home to renting one, for some groups, there is a gap between their aspirations and reality. In California, homeownership is highest for white Americans at 64% with the lowest rate belonging to African Americans at 41%. This matches the nationwide trend and reflects past policies that excluded minority groups from housing programs that helped subsidy homeownership for white Americans. The resulting homeownership gap led to a wealth gap, as white Americans were able to build equity based on home price appreciation over the decades. The commonly suggested solution is thus to reduce the wealth gap by reducing the homeownership gap.

In this paper, I examined the homeownership gap for different race/ethnic groups, focusing on factors related to homeownership in California using data from the 2020 California Health Interview Survey (CHIS). Based on a survey of the literature in Section II, I identified demographic, family status, and socio-economic variables as key explanatory variables for homeownership. For race/ethnicity, I used the survey's race/ethnicity variable and the language spoken at home as a proxy for country of origin. I chose homeownership as the dependent variable. I converted all variables of interest to dummy variables. I discuss the model built on these variables in Section III and the data itself in Section IV. In Section V, I go over the regression analysis results and conclude with policy recommendations based on the results in Section VI.

The results reveal that African Americans are 50% less likely to be homeowners than white Americans. Asian Americans are 45% more likely to be homeowners than white Americans and those that spoke English and Chinese at home are 63% more likely to be homeowners than those that only speak English at home. On the other hand, those that spoke Vietnamese or Korean at

home were 71% and 61% less likely to be homeowners than those that spoke English at home. I found that Native Americans and Hispanic Americans have no statistically significant different likelihood from white Americans. Moreover, those that spoke Spanish only at home have no significant difference in their likelihood to be a homeowner than those that spoke only English at home. However, those that speak Spanish and English at home have a 33% higher likelihood to be a homeowner than those who spoke only English. The likelihood of being a homeowner increased with age, educational attainment, marital status, and income, which matches findings from other studies. The results confirm that while in theory the homeownership rate should be explained by variables such as family status and income, other factors prevent some minority groups from attaining homeownership.

I recommend that policymakers take a closer look at which specific race/ethnic groups are facing barriers and use a more targeted approach because there could be differences within the groups based on ethnicity and location. Another recommendation is to increase the amount of housing. Per the studies in the literature review, the amount of savings is a much stronger determinant of homeownership than income, but when rents are high, it becomes much harder to save. Thus, one solution would be to build more housing to decrease the cost of rent and increase the amount households can save. However, homeownership itself should not be the only metric to follow, as it can itself be a risky endeavor. Past policies looked at increasing quantity, but the resulting default wave wiped out many program participants' savings and ruined their credit history. Therefore, another recommendation is to create a more comprehensive homeownership program that would provide stability and allow participants to access the gains of homeownership. A comprehensive housing program would be a step toward reversing historical injustices in America.

Acknowledgements

This endeavor would not have been possible without my thesis advisor, Dr. Robert Wassmer, whose guidance in writing this paper I am thankful for. I would like to express my deepest appreciation for the education I received from the Department of Public Policy and Administration at California State University, Sacramento. I am also thankful for my family and friends for their support during my studies and the writing of this paper.

Analyzing the Homeownership Gap Between Different Race/Ethnic Groups in California

Abstract

While many people would prefer to own their homes rather than rent, for some groups this goal has been more readily achievable. Though many believe that factors such as educational attainment, income levels, and marital status should be able to explain those gaps, these factors only partially account for the differences between race/ethnic groups. In this paper, I use a logistic regression to examine the differences in the homeownership rate between race/ethnic groups, focusing on what factors correlate both positively and negatively to homeownership in California using data from the 2020 California Health Interview Survey (CHIS). The results revealed African Americans are 50% less likely to be homeowners than white Americans. The chances for Latino Americans did not vary significantly from white Americans while Asian Americans are 45% more likely to be homeowners than white Americans. The likelihood of being a homeowner increased with age, educational attainment, marital status, and income which confirms findings from other studies. The results raise questions regarding why race and ethnicity of an individual, after controlling for factors commonly thought to influence homeownership continue to exert an influence on the homeowner tenure status of an individual.

Key words: Homeownership, logistic regression, housing, wealth

Word count: 5,798

I. Introduction

Public opinion polls reveal that most Americans would rather own their home than rent one, regardless of their political orientation, race/ethnicity, or citizenship status (McCabe, 2018). A study investigating what motivated people to buy homes found that the top two reasons were to acquire greater control over their living space and to live in a safe place. The study also found that certain motivators were more likely to be chosen by some groups over others. For instance, while the least popular motivators were the civic benefits and social status of homeownership, African American and Latino groups were more likely to identify them as motivators than non-Hispanic White Americans. These two groups were also more than twice as likely to identify wealth building as an important reason to pursue homeownership and were less likely to say that rent was a bad investment. The latter preference suggests that the pull factor of homeownership is stronger than the push factor of rising rents. Yet, despite the strong pull of homeownership, for some people there exists a gap between desire and reality. Thus, the goal of my paper will be to examine these gaps in homeownership and how different demographic, socio-economic, and locational factors affect the homeownership rate for different race/ethnicity groups. In the rest of this section, I will discuss the link between homeownership and wealth building and end with a summary of what the rest of the paper will cover.

Part of the source of these homeownership disparities can be explained by government policies put in place post World War II. During the Cold War, government officials believed that one way to combat communism at home was to promote private homeownership (Rothstein, 2018). However, these policies did not provide homeownership opportunities equally among American citizens but favored white American citizens over others. For instance, the Department of Veterans Affairs denied home subsidies offered to white Americans by the G.I. Bill to minorities and restricted benefits wherever they could. Therefore, those minorities were not able

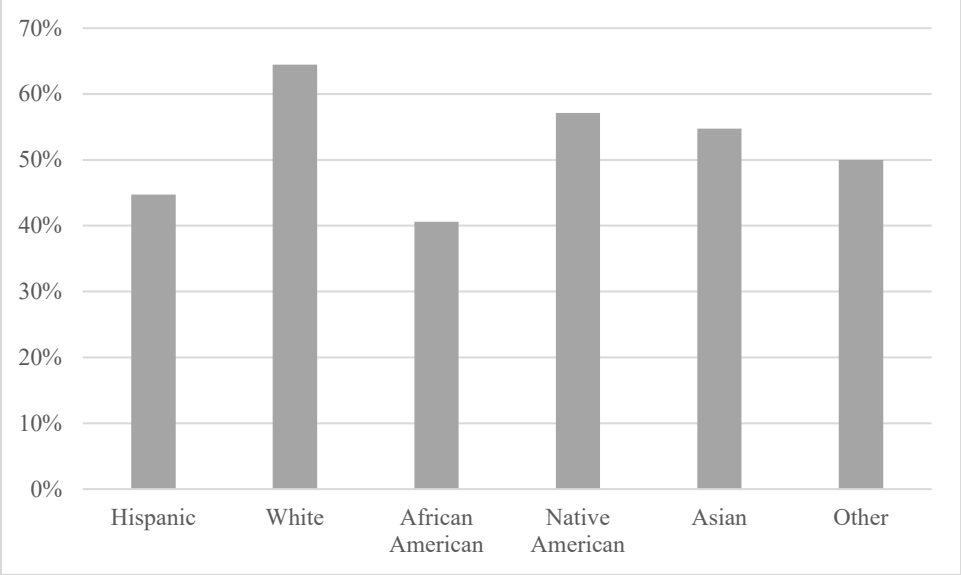
to be part of the home equity appreciation that followed in the coming decades and thus, were not able to start building intergenerational wealth that their white peers were able to build. This price appreciation has also led to homes becoming increasingly unaffordable for new homebuyers and led to a substantial wealth gap between white Americans and black Americans in particular. For California, I summarized the homeownership gap for different race/ethnic groups in Figure 1, which shows that the average homeownership rate varies by group. White Americans have the highest homeownership rate at 64% with the two lowest being Hispanic Americans at 45% and African Americans at 41%. It follows closely with the United States homeownership rates, which have white Americans with the highest rate at 73% and Latinos and African Americans at the lowest with 46% and 43% respectively (McCabe, 2018). While factors such as educational attainment, income levels, and marital status should be able to explain differences in homeownership, these factors only partially account for the differences between race/ethnic groups.

To compensate these groups for the denial of opportunity, one commonly recommended strategy is to close the homeownership gap (Shapiro, 2016; Sullivan et al., 2015). In an analysis completed in 2015 by two public policy organizations, Demos and the Institute on Assets and Social Policy (IASP), they found that eliminating the homeownership gap would have the most substantial impact on the racial wealth gap as compared to college graduation. This includes not only closing the homeownership gap but also the gap in financial gains from homeownership since other reports have shown that African American and Latino households also gain less from housing equity than their white counterparts (McCabe, 2018). Having access to these gains helps households stay stable financially as well as allows them to finance their education or start new

businesses (Sullivan et al., 2015). Therefore, addressing these disparities would be a step toward reversing and perhaps even resolving historic injustices in America.

In the next section, I review other studies concerning disparities in homeownership rates across different populations. In Section III, I discuss my regression model and choice of dependent and explanatory variables. I describe those variables and their relationships with one another in more depth in Section IV. Then, in Section V, I provide the results of my regression model and discuss what issues I encountered, and how I addressed them. I conclude my paper in Section VI with a discussion of my results, how they compare to my expectations and other literature, and make two recommendation for policy makers.

Figure 1: Homeownership rate for the six race/ethnic groups



II. Literature Review

This section is a literature review of studies that analyzed the disparities in homeownership rates between different race/ethnicities. The purpose of this review is to examine how differences in (1) demographics, (2) citizenship/legal status, and (3) wealth contributes to the homeownership gap between different groups. The review concludes with a summary of the key variables covered in this review and how I will approach studying this topic in my research. I provided a summary of the papers covered in this section in the Appendix as Table 9.

While in theory higher income should translate to higher homeownership rates, income differences alone are not able to account for the disparities in homeownership rates (Chakrabarty et al., 2018). Using the sample means by ethnic group data from Coulson's (1998) study it is possible to list homeownership rates from highest to lowest in this order: White (0.714), Asian (0.524), Black (0.440), Hispanic (0.406). However, listing these same groups by median household income is as follows: Asian ($54,156), White ($47,611), Hispanic ($31,876), and Black ($30,612). Moreover, when Coulson used a probit model to estimate homeownership rates using income, the predicted values for each group were Asian (0.671), White (0.656), Hispanic (0.608), Black (0.603). Since these do not match the actual homeownership rates, income alone does not explain the differences. While Coulson's (1998) study used the 1996 Current Population Survey from the Census Bureau, more recent studies have found that these differences have persisted over time. The analysis by Desilva and Elmelech (2012) which used 3-Year American Community Survey (ACS) data sample from 2005 to 2007 listed ethnic groups from highest to lowest using homeownership rates with nearly the same order—White (0.718), Asian (0.596), Hispanic (0.457), Black (0.434). Noticeably, almost all rates increased except for Black Americans, which decreased.

However, this data was from the height of the housing boom and does not account for the housing bust that followed in 2007. The regression study by Chakrabarty et al. (2018) had a wider time range using the American Community Survey (ACS) from 2001 to 2015. Instead of using a sample mean for each group, they used the regression-adjusted differences in homeownership rates each ethnic group had relative to white non-Hispanic natives. They ran a separate regression model for the years 2000, 2007, and 2015 with each year having two models: one with controls for socioeconomic and metropolitan effects and one without. They also separated each ethnic group based on whether they were native-born citizens or immigrants. Their analysis showed that after the housing market collapse in 2007, the hardest hit were native Black and Hispanic households as the homeownership gap relative to non-Hispanic white natives increased from -0.267 to -0.313 for Black Americans and -0.185 to -0.212 for Hispanic Americans. Meanwhile, Asian American natives made gains as their homeownership gap decreased from -0.160 to -0.144—a trend that persists even when controlled for socioeconomic and metropolitan area effects. To explain these differences, these studies looked at several different factors such as demographics, citizenship status, and wealth.

Regarding demographics, variables like age can serve as a proxy for income as they relate to educational attainment and common life cycle milestones such as career advancement and household structure (Chakrabarty et al., 2018; Shapiro, 2006). Since income tends to increase with age as people advance in their careers, the rate of homeownership also tends to increase with age with about 75% of first-time homebuyers being between the ages of 25 and 44 (Skobba, 2013). Moreover, Coulson (1998) found that adding the age of the household head as a variable to his probit model had a quantitively significant impact on the homeownership rate such as for Hispanic households which saw a decrease in the homeownership rate from 56.6% to

50.1%. Coulson's method was to create a series of probit models for each racial group (White, Black, Hispanic, Asian). He found that age accounted for about one-fifth of the gap between the Hispanic and White American homeownership rates and one-third of the gap between Asian Americans and White Americans. Additionally, a review by Skobba (2013) found that the White population in the United States had the highest median age while the Hispanic population had the lowest.

Another factor to consider for demographics is marital status and the number of children. For instance, a top motivator for homeownership from McCabe's (2018) study for many groups was to find more space for their family and to obtain a good education for their children. Multiple studies have found that marital status and family size have a positive correlation with homeownership rates (Skobba, 2013). In addition to that, single adults are less likely to be homeowners compared to married adults. However, despite the high rate of family formation for Hispanic and Black Americans, their rate of homeownership is lower than expected (Coulson, 1998). In summary, age, marital status, and family size are three demographic variables that account for a portion of the disparity in homeownership rates.

Citizenship status is another factor that accounts for some of the differences in the homeownership gap between different races/ethnicities by dividing these groups into whether they are native-born citizens or immigrants. Many studies such as those by Coulson (1998), Kuebler (2013), McConnell (2015), and Chakrabarty et al. (2018) found that there is a significant difference in homeownership rates between natives and immigrants of the same racial/ethnic groups. For example, Coulson (1998) showed that this factor alone lowered each group's homeownership rate by about 10-16 percent. Desilva and Elmelech (2012) found that immigrants are 44.7% less likely to be homeowners upon arrival, but that likelihood decreases with each

year spent in the United States. Moreover, this effect can vary within groups as they further subdivided the Hispanic group into Mexican, Puerto Rican, and other Hispanic. They found that immigration only explains about 1.99% of the difference in homeownership rates between Puerto Ricans and native white non-Hispanics—the lowest of any group aside from Black Americans. Thus, for Puerto Ricans, socio-economic and demographic variables account for a bigger portion of the difference than immigration compared to other Hispanic groups. Meanwhile, Kuebler's (2013) study also divided Black Americans into sub-groups and found that Afro-Caribbeans generally fared better in the housing market, which could be due to differences in household formation.

Chakrabarty et al. (2018)'s regression study also further divided Asians and Hispanics based on nativity and country of origin. They ran a regression model with and without socioeconomic and metropolitan effect controls for the years 2000, 2007, and 2015. Their results confirmed Desilva and Elmelech's (2012) findings that the impact of immigration varies within racial groups. For example, they also found that immigration only explains about two percent of the white-minority homeownership gap for Puerto Ricans as compared to Mexicans. They concluded that immigration status has little influence on this group compared to other factors such as demographics and choice of metropolitan area because of Puerto Ricans' unique citizenship status. Moreover, this group showed little improvement in their homeownership rates over fifteen years. Meanwhile, other groups such as Vietnamese immigrants and natives made substantial progress and by 2015, the Vietnamese immigrant homeownership rate overtook the white non-Hispanic native rate by about 0.039% (Chakrabarty et al., 2018). This is the strength of Chakrabarty et al.'s (2018) study as it shows there can be significant heterogeneity within the same racial or ethnic group. Moreover, they showed that the gap between the immigrant and

native populations of a racial group could change over time due to the changing origin of immigrants and thus it can be more informative to separate groups by country of origin.

Furthermore, while Chakrabarty et al.'s (2018) study found that immigrants could eventually catch up with their ethnic native counterparts and sometimes even surpass them, some constraints cannot be overcome. McConnell (2015)'s study focused on Latinos and compared homeownership rates within this group based on whether they were native-born citizens, naturalized citizens, authorized immigrants, or non-authorized immigrants. Using data from the Los Angeles Family and Neighborhood Survey collected between April and January 2002 on about 3,000 households, her logistical regression model showed that legal status was not a barrier that could be overcome with time. For instance, she included a lesser-used variable in homeownership analyses such as having a bank account and found that only about 16.2% of unauthorized immigrants had one compared to about 44.9% of authorized immigrants and 66.8% of naturalized citizens. Using logistic regression analysis, she found that, compared to naturalized Latino citizens, unauthorized non-citizen immigrants are about 95% less likely to be homeowners. This finding was significant at the five percent level. Moreover, she speculated that there might be other factors not typically included in the usual multivariate analyses on immigrant homeownership such as whether the households paid remittances. However, a limit of her study is its focus was on only one sample in Los Angeles, a city that is more unaffordable than most and could thus be unrepresentative of other areas in the United States or even other parts of the state.

The choice of location of an individual is not widely included as a variable accounted for in the determination of homeowner status, but locations tend to vary by affordability. Thus, the amount of wealth a family has and their access to credit can constrain where they buy their

home. A study by Gyourko, Linneman, and Wachter (1999) found that white Americans are more likely to own in suburban locations while minorities are more likely to own in central city locations. Moreover, these differences in location had implications for long-term wealth accumulation, as even minority households not constrained by income or wealth were more likely to locate in those locations. Aside from location, there is even a difference when it comes to making the choice to becoming a homeowner. While studying the transition from renting to owning from 1991 to 1996 for various households, Charles and Hurst (2002) found that while there was little difference in the amount of rent paid by White and Black households, Black households initiated less mortgage applications. They found that there remained a gap in mortgage applications even when controlling for income, demographics, and creditworthiness, but controlling for the wealth of the household's parents significantly reduced the application gap between White and Black households. Thus, they speculated that part of the gap could be due to anticipated bad treatment from banks and the real estate market, but also due to lack of financial assistance from family members. However, causality in this instance is unclear: does the lack of wealth affect homeownership rates or does homeownership influence how much wealth a family has? In addition to that, a study by Collins and Margo (2001) found that while the homeownership gap between White and Black households has narrowed over the past century, a hinderance to Black wealth accumulation has been the relative value of Black-owned property to White-owned property in the housing market.

Furthermore, the homeownership gap varies with the amount of wealth. Gyourko, Linneman, and Wachter (1999) found no homeownership gap in households that had wealth large enough to easily meet down payment requirements but did find a gap in lower wealth households. Meanwhile, Alba and Logan (1992) found that the gap between high income and

low-income White Americans is much smaller compared to other races/ethnicities. Another study by Hilber and Liu (2007) found that differences in wealth and home location accounted for much of the gap. Parental wealth had a statistically significant, but quantitatively small positive impact on housing tenure, but the authors did not find it to have a significant impact on homeownership. Kuebler (2013) found that White Americans paid their down payment without family assistance 54% of the time, while Black Americans paid the entire down payment without assistance 90% of the time. On the other hand, the household's own wealth had a statistically significant effect on homeownership rates. Charles and Hurst's (2002) findings suggest the difference in effect of parental wealth could be due to it playing a larger role in homeownership rates for White Americans while playing a much smaller role for Black Americans. This adds to Linneman and Wachter's (1989) findings that while income and wealth both constrain homeownership, the effect of wealth is larger.

In conclusion, while it might make sense for homeownership rates to be a simple output of income and demographics, those factors only explain a portion of the differences between groups, especially between groups of different races and ethnicities. There are also gaps within these groups. This gap lessens over time as immigrants assimilate into their new society, but the legal status remains a barrier not easily overcome. Moreover, the amount of wealth a household has also constraints the decision to become a homeowner, but it has a larger influence on Black Americans than White Americans. A topic for further research would be to investigate whether the sources of white-minority disparities in homeownership rates have changed in recent years.

To this end, I will be using California Health Interview Survey 2020 data to analyze whether these disparities still exist in California and to what extent. What I learned from the previous described literature review is since groups vary in areas such as age and citizenship

status, those factors affect their homeownership to various degrees. This understanding guided me more in the necessity to account for causal factors that can explain differences in home ownership like age, marital status, race/ethnicity, and citizenship status in my analysis. However, as the survey data does not include questions about wealth or savings, I will be relying on the income variable instead.

III. Model

In this section, I discuss my choice of the dependent variable and its relation to my research question. I include an overview of the data set I used and its limitations. I also cover the selection of explanatory variables and the expected influence of each on home ownership. I end by explaining what my expectations are for the effect of each explanatory variable.

My dependent variable is a dummy variable that indicates if the household owns their home (housing tenure). The homeownership variable, along with the explanatory variables, comes from the California Health Interview Survey (CHIS) 2020 data set. The 2020 data set contains about 21,949 observations. This is a mixed-mode survey conducted by the University of California Center for Health Policy Research (2021) which uses an address-based sampling (ABS) frame to gather information on the health of the Californian population. Mixed-mode includes telephone and web-based surveys, which alleviates some concerns about selection bias due to the fall in telephone response rates over the last couple of years[1].

With the understanding of what is contained in this data, I created the model offered in Figure 2 that serves as the basis for a regression analysis. For the race/ethnicity categories, I used the survey's California Department of Finance (DOF) race-ethnicity variable. In addition to that, I used the language at home variable as well as the ancestry category that split respondents into whether they had Mexican heritage or other Latino heritage. Since according to other studies, home ownership tends to increase with age, educational attainment, and income, I included the self-reported age, educational attainment, and income variables from the survey. Moreover, since the presence of children also increases the likelihood of homeownership, I created a family type

[1] Data gathering documentation for the California Health Interview Survey (CHIS) can be found at: https://healthpolicy.ucla.edu/chis/design/Pages/2019-2020-methods.aspx.

variable with four categories. As citizenship can create a barrier to homeownership and this can be a stronger factor for some groups, I used the citizenship status variable. I also used years lived in the U.S. to see how homeownership rates may increase with time for immigrants. Moreover, since location can determine the affordability of a home, largely based on differences in land costs, I included a set of dummy variables that account for type of community based on Census definitions for Urban and Rural by Block Groups. However, the biggest limitation I found was the lack of data on wealth and credit. Some studies noted the importance of using wealth since it could serve as a strong determinant of homeownership, even stronger than income. Furthermore, it can also be an important factor in explaining homeownership gaps between different race/ethnic groups. However, other studies used income and educational attainment to proxy for wealth and I will do so as well. This is necessary because CHIS data does not include any measure of wealth. Given what we know about average differences in household wealth accumulation by race and ethnicity, the influence this captures on home ownership is likely in part due to documented average group differences in wealth.

Figure 2: Regression's theoretical model framework

Homeownership$_i$= f (Race/Ethnicity$_i$, Demographics$_i$, Family Type$_i$, Citizenship Status$_i$, Location$_i$, Socio-Economic Status$_i$)

Race/Ethnicity$_i$ = f ([White American dummy$_i$ excluded], Hispanic American dummy$_i$, African American dummy$_i$, Asian American dummy$_i$, Native American dummy$_i$, Other Race/Two or More Races dummy$_i$, [Other Latino Heritage dummy$_i$ excluded], Mexican Heritage dummy$_i$, [Language Spoken at Home English dummy$_i$ excluded], Language Spoken at Home Spanish dummy$_i$, Language Spoken at Home Chinese dummy$_i$, Language Spoken at Home Vietnamese dummy$_i$, Language Spoken at Home Korean dummy$_i$, Language Spoken at Home Other One Language dummy$_i$, Language Spoken at Home English & Spanish dummy$_i$, Language Spoken at Home English & Chinese dummy$_i$, Language Spoken at Home English & European Lanague dummy$_i$, Language Spoken at Home English & Other Asian Language dummy$_i$, Language Spoken at Home English & One Other Language dummy$_i$, Language Spoken at Home Other Languages dummy$_i$)

Demographics$_i$ = f ([Self-Reported Age 18-25 dummy$_i$ excluded$_i$], Self-Reported Age 26-29 dummy$_i$, Self-Reported Age 30-34 dummy$_i$, Self-Reported Age 35-39 dummy$_i$, Self-Reported Age 40-44 dummy$_i$, Self-Reported Age 45-49 dummy$_i$, Self-Reported Age 50-54 dummy$_i$, Self-Reported Age 55-59 dummy$_i$, Self-Reported Age 60-64 dummy$_i$, Self-Reported Age 65-69 dummy$_i$, Self-Reported Age 70-74 dummy$_i$, Self-Reported Age 75-79 dummy$_i$, Self-Reported Age 80-84 dummy$_i$, Self-Reported Age 85+ dummy$_i$)

Family Status$_i$ = f ([Single with no Kids dummy$_i$ excluded], Single with Kids dummy$_i$, Married with no Kids dummy$_i$, Married with Kids dummy$_i$)

Citizenship Status$_i$, = f (US-Born Citizen dummy$_i$, Naturalized Citizen dummy$_i$, [non-Citizen dummy$_i$ excluded], [Years Lived in the U.S. Less than 5 Years dummy$_i$ excluded], Years Lived in the U.S. 5 to 10 Years dummy$_i$, Years Lived in the U.S. 11 to 14 Years dummy$_i$, Years Lived in the U.S. 15 to 19 Years dummy$_i$)

Location$_i$, = f ([Urban dummy$_i$ excluded], Second City dummy$_i$, Mixed dummy$_i$, Surban dummy$_i$, Town dummy$_i$, Rural dummy$_i$)

Socio-Economic Status$_i$ = f ([No Formal Education or Grade 1-8 dummy$_i$ excluded], Grade 9-12/High School Diploma dummy$_i$, Some College dummy$_i$, Vocational School dummy$_i$, AA or AS Degree dummy$_i$, BA or BS Degree/Some Grad School dummy$_i$, MA or MS Degree dummy$_i$, Ph.D. or Equivalent dummy$_i$, [Total Annual Income Less Than $10,000 dummy$_i$ excluded], Total Annual Income $10,000 - $19,999 dummy$_i$, Total Annual Income $20,000 - $29,999 dummy$_i$, Total Annual Income $30,000 - $39,999 dummy$_i$, Total Annual Income $40,000 - $49,999 dummy$_i$, Total Annual Income $50,000 - $59,999 dummy$_i$, Total Annual Income $60,000 - $69,999 dummy$_i$, Total Annual Income $70,000 - $79,999 dummy$_i$, Total Annual Income $80,000 - $89,999 dummy$_i$, Total Annual Income $90,000 - $99,999 dummy$_i$, Total Annual Income $100,000 - $109,999 dummy$_i$, Total Annual Income $110,000 - $119,999 dummy$_i$, Total Annual Income $120,000 - $129,999 dummy$_i$, Total Annual Income $130,000 - $139,999 dummy$_i$, Total Annual Income $140,000 - $149,999 dummy$_i$, Total Annual Income $150,000 - $159,999 dummy$_i$, Total Annual Income $160,000 - $169,999 dummy$_i$, Total Annual Income $170,000 - $179,999 dummy$_i$, Total Annual Income Over $180,000 dummy$_i$,)

IV. Data

In this section, I will describe the data used in the regression analysis and the correlations between them. Table 1 summarizes the descriptive statistics for the variables included as well as the expected influence. Table 2 summarizes the percentage of each race/ethnic group that is a citizen/non-citizen while Table 3 shows the percentage of each race/ethnic group that lives in a certain area. Table 4 shows how much of each race/ethnic group falls into which age group and Table 5 shows how much of each group falls into which income category.

Since the CHIS survey answers used here are categorical, I converted all variables of interest to dummy variables taking on the values of zero or one. From the survey results, I found that about 54% of Californians are homeowners, 38% are renters, and the remainder either have an alternative arrangement, did not know the answer, or refused to answer. The explanatory variables used were close or approximate ones of the ones used in by some of the other studies in the literature review. Table 1 provides the descriptive statistics for all variables as well as the expected effect of the variables on the dependent variable. In general, I expect the likelihood of homeownership to increase with age, higher educational attainment, and higher income. Based on the literature review, I expect Asian Americans to have a higher likelihood than other groups and the same goes for those that speak English and another Asian language at home. However, those that only speak one Asian language at home I assume have a lower likelihood because the lack of English implies that they are immigrants that are more recent and or/less assimilated. Between those with Mexican heritage and those with other Latino heritage, I cannot make a guess which one would have a higher likelihood. However, I expect non-citizens to have a lower likelihood than naturalized and native citizens. I also expect the being married with children will increase the likelihood of homeownership while being single without kids will decrease the

likelihood. For the location, I expect more urbanized areas to have lower likelihoods than more rural areas.

Since most of those studies found a strong negative influence of immigration on homeownership rates, I looked at what proportion of each race/ethnic group consisted of immigrants. As Table 2 shows, the two groups with the largest portion of non-citizens are Asians (25%) and Hispanics (20%). The citizenship group includes native-born and naturalized citizens. Location is another important factor, so Table 3 summarizes the percentage of each race/ethnic group by residential area. It shows that in California, more than half of Hispanic Americans (56%), African Americans (63%) and Asian Americans (60%) reside in an urban area. White Americans are also the largest group living in a suburban area (20%), followed closely by Native Americans (19%). Moreover, Table 5 shows that white Americans and Asian Americans have high percentages in their group in the upper income category and the lowest percentage for the low-income group.

Table 1: Descriptive statistics and expected influence

Variable Name	Mean	Std. Dev.	Min	Max	Expected Influence
Dependent Variable					
Homeownership Dummy	0.54	0.00	0	1	N/A
Race/Ethnicity					
White American	0.38	0.00	0	1	+
Hispanic American	0.39	0.00	0	1	-
African American	0.05	0.00	0	1	-
Asian American	0.13	0.00	0	1	+
Native American	0.00	0.00	0	1	-
Other Race/Two or More Races	0.03	0.00	0	1	-
Language Spoken at Home - English	0.55	0.00	0	1	+
Language Spoken at Home - Spanish	0.08	0.00	0	1	-
Language Spoken at Home - Chinese	0.02	0.00	0	1	-
Language Spoken at Home - Vietnamese	0.01	0.00	0	1	-
Language Spoken at Home - Korean	0.01	0.00	0	1	-
Language Spoken at Home - One Other Language	0.02	0.00	0	1	-
Language Spoken at Home - English & Spanish	0.22	0.00	0	1	-
Language Spoken at Home - English & Chinese	0.01	0.00	0	1	-
Language Spoken at Home - English & European	0.01	0.00	0	1	-
Language Spoken at Home - English & Other Asian	0.05	0.00	0	1	+
Language Spoken at Home - English & One Other	0.01	0.00	0	1	-
Language Spoken at Home - Other Languages	0.02	0.00	0	1	-
Mexican Heritage	0.30	0.00	0	1	?
Other Latino Heritage	0.10	0.00	0	1	?
Demographic Characteristics					
Self-Reported Age 18-25	0.14	0.00	0	1	-
Self-Reported Age 26-29	0.08	0.00	0	1	-
Self-Reported Age 30-34	0.09	0.00	0	1	+
Self-Reported Age 35-39	0.09	0.00	0	1	+
Self-Reported Age 40-44	0.08	0.00	0	1	+
Self-Reported Age 45-49	0.08	0.00	0	1	+
Self-Reported Age 50-54	0.08	0.00	0	1	+
Self-Reported Age 55-59	0.08	0.00	0	1	+
Self-Reported Age 60-64	0.08	0.00	0	1	+
Self-Reported Age 65-69	0.07	0.00	0	1	+
Self-Reported Age 70-74	0.05	0.00	0	1	+
Self-Reported Age 75-79	0.04	0.00	0	1	+
Self-Reported Age 80-84	0.03	0.00	0	1	+
Self-Reported Age 85+	0.02	0.00	0	1	+

Variable Name	Mean	Std. Dev.	Min	Max	Expected Influence
Family Status					
Single, no kids	0.40	0.00	0	1	-
Single with kids	0.10	0.00	0	1	-
Married, no kids	0.30	0.00	0	1	-
Married with kids	0.20	0.00	0	1	+
Citizenship Status					
US-Born Citizen	0.67	0.00	0	1	+
Naturalized Citizen	0.20	0.00	0	1	+
Non-Citizen	0.13	0.00	0	1	-
Lived in the U.S. < 5 Years	0.01	0.00	0	1	-
Lived in the U.S. 5-9 Years	0.01	0.00	0	1	-
Lived in the U.S. 10-14 Years	0.02	0.00	0	1	-
Lived in the U.S. 15-19 Years	0.18	0.00	0	1	+
Location					
Urban	0.49	0.00	0	1	-
Second City	0.07	0.00	0	1	-
Mixed	0.15	0.00	0	1	-
Suburban	0.17	0.00	0	1	+
Town	0.08	0.00	0	1	+
Rural	0.04	0.00	0	1	+
Socio-Economic Status					
No Formal Education/Grade 1-8	0.08	0.00	0	1	-
Grade 9-11	0.02	0.00	0	1	-
Grade 12/High School Diploma	0.21	0.00	0	1	-
Some College	0.12	0.00	0	1	-
Vocational School	0.04	0.00	0	1	-
AA or AS Degree	0.06	0.00	0	1	-
BA or BS Degree	0.25	0.00	0	1	+
MA or MS Degree	0.12	0.00	0	1	+
Ph.D. or Equivalent Degree	0.05	0.00	0	1	+
Total Annual Income < $10,000	0.05	0.00	0	1	-
Total Annual Income $10,000 - $19,999	0.08	0.00	0	1	-
Total Annual Income $20,000 - $29,999	0.09	0.00	0	1	-
Total Annual Income $30,000 - $39,999	0.08	0.00	0	1	-
Total Annual Income $40,000 - $49,999	0.06	0.00	0	1	-
Total Annual Income $50,000 - $59,999	0.07	0.00	0	1	-
Total Annual Income $60,000 - $69,999	0.06	0.00	0	1	-
Total Annual Income $70,000 - $79,999	0.06	0.00	0	1	-
Total Annual Income $80,000 - $89,999	0.05	0.00	0	1	-

Variable Name	Mean	Std. Dev.	Min	Max	Expected Influence
Total Annual Income $90,000 - $99,999	0.04	0.00	0	1	-
Total Annual Income $100,000 - $109,999	0.05	0.00	0	1	+
Total Annual Income $110,000 - $119,999	0.03	0.00	0	1	+
Total Annual Income $120,000 - $129,999	0.04	0.00	0	1	+
Total Annual Income $130,000 - $139,999	0.02	0.00	0	1	+
Total Annual Income $140,000 - $149,999	0.02	0.00	0	1	+
Total Annual Income $150,000 - $159,999	0.03	0.00	0	1	+
Total Annual Income $160,000 - $169,999	0.02	0.00	0	1	+
Total Annual Income $170,000 - $179,999	0.01	0.00	0	1	+
Total Annual Income > $180,000	0.14	0.00	0	1	+

Table 2: Summary of citizenship among races/ethnicities in California

Race/Ethnicity	Citizen	Non-Citizen
Hispanic	80%	20%
White	97%	3%
African American	95%	5%
Native American	100%	0%
Asian	75%	25%
Other	97%	3%
Overall	**87%**	**13%**

Table 3: Summary of percentage urban and rural among races/ethnicities in California

Race/Ethnicity	Urban	2nd City	Mixed	Suburban	Town	Rural
Hispanic	56%	12%	13%	10%	7%	2%
White	37%	4%	20%	23%	10%	7%
African American	63%	6%	13%	14%	3%	2%
Native American	40%	6%	19%	7%	14%	14%
Asian	60%	2%	11%	22%	3%	1%
Other	45%	4%	14%	21%	11%	5%

Table 4: Summary of percentage of age group among races/ethnicities in California

Race/Ethnicity	18-25	26-29	30-39	40-49	50-59	60-69	70-79	80+
Hispanic	19%	9%	21%	18%	15%	10%	6%	2%
White	8%	6%	15%	13%	15%	19%	14%	9%
African American	10%	5%	14%	14%	22%	18%	10%	6%
Native American	1%	9%	24%	12%	12%	15%	11%	17%
Asian	15%	8%	18%	18%	16%	13%	7%	5%
Other	16%	11%	24%	13%	15%	12%	7%	2%

Table 5: Summary of percentage of low/middle/upper income for races/ethnicities in California[2]

Race/Ethnicity	Low	Middle	Upper
Hispanic	49%	41%	11%
White	25%	47%	28%
African American	40%	48%	12%
Native American	44%	45%	13%
Asian	30%	42%	28%
Other	27%	49%	24%

[2] The categories were created using Pew Research's definition of Low Income (less than $52,000), Middle Income ($52,200 - $156,600), and Upper Income (more than $156,600).

VI. Results

In this section, I discuss the results of the regression analyses that included an exploratory OLS and the final reported upon logistic. I explain how I checked and adjusted my model for multicollinearity as well as which interaction effects I tested. I conclude with a discussion of my chosen form for my model.

After converting all my explanatory variables to dummy variables, I performed an OLS regression and then ran the Ramsey Regression Equation Specification Error Test (RESET) test to check for any omitted variables. Since the p-value was less than 0.10, I could reject the null hypothesis that the model has no omitted variables. Next, I reran the model with the survey weights. The survey weights are required as the CHIS data does not use a simple random sample and thus, there is the possibility of underestimating the variance of estimates if no weights are used[3]. The primary purpose of this OLS regression is the calculation of variance of inflation factors (VIFs) to check for the possibility of multicollinearity through a VIF value over five as shown in Table 6 at the end of this section. I found that variables with higher VIF values than five were mostly related to educational attainment. The Income Over $180,000 variable, The Naturalized Citizen variable, and Living in the U.S. 15-19 for Years variable were also over five. Since the Naturalized Citizen variable and the Living in the U.S. 15-19 Years variable were strongly positively correlated with a value of 0.81, I combined the Living in the U.S. 15-19 Years variable with the Living in the U.S. 10-14 Years variable to create the Living in the U.S. 10-19 Years variable. I also combined Living in the U.S. less than 5 Years variables with the Living in the U.S. 5-9 Years Variable to create the Living in the U.S. 0 to 9 Years variable. Since

[3] Further information on the survey weights and methods can be found at: https://healthpolicy.ucla.edu/chis/analyze/Pages/weighting.aspx.

the educational attainment variables are not highly correlated with any other variables and their values in the model all had p-values of less than 0.10, they remained unchanged.

After correcting for multicollinearity, I ran the more appropriate logistic regression model based upon the use of a dichotomous dependent variable. I also ran several checks for possible interaction effects since I wanted to see whether location had an outsized effect on the race/ethnicity variables. The results are in Table 8 at the end of this section. I found that the urban variable had no statistically significant interaction effect with the white Americans, Asian Americans, Latino Americans, African American variables, but did have one with the Native American. The urban variable increased the odds of being a homeowner by 729% for Native Americans. On the other hand, the interaction effect between those that speak Spanish at home and the Urban variable was found to be statistically significant in the opposite direction by decreasing the likelihood of homeownership by 200%. Moreover, the 2nd City variable increased the likelihood of homeownership for Hispanic Americans by 136% while the suburban variable decreased the likelihood of homeownership by 67%. The suburban variable had an opposite effect on the Asian American and Mixed-Race variable by increasing the likelihood of homeownership instead by 89% and 56% respectively. Most of the other results for interaction effects between location and race/ethnicity had no significant results.

Furthermore, to test whether any variables are missing or unnecessary, I ran the specification link test. The result showed that my model was not misspecified, so I did not make any more changes. The classification statistics result for this model showed that the overall rate of correct classifications was 78.71%. The model was able to correctly identify homeowners about 90.68% of the time, but only correctly identify non-homeowners 50.94% of the time.

Table 6: Variance Inflation Factors from highest to lowest (after using logistic regression)

Variable Name	VIF
BA or BS Degree	16.53
MA or MS Degree	11.11
Some College	10.05
Grade 9-12/High School Diploma	7.55
Naturalized Citizen	6.91
Lived in the U.S. 15-19 Years	6.90
Ph.D. or Equivalent Degree	5.95
AA or AS Degree	5.77
Total Annual Income > $180,000	5.35

Table 7: Logistic regression results for the dichotomous dependent variable[4]

Variable Name	Odds Ratio
Constant	0.316
Race/Ethnicity	
White American (reference)	
Hispanic American	0.876
African American	0.509 ***
Asian American	1.451 ***
Native American	1.159
Other Race/Two or More Races	0.822 *
Language Spoken at Home - English (reference)	
Language Spoken at Home - Spanish	1.122
Language Spoken at Home - Chinese	1.336
Language Spoken at Home - Vietnamese	0.295 ***
Language Spoken at Home - Korean	0.393 **
Language Spoken at Home - One Other Language	0.271 ***
Language Spoken at Home - English & Spanish	1.343 ***
Language Spoken at Home - English & Chinese	1.628 **
Language Spoken at Home - English & European	0.743 *
Language Spoken at Home - English & Other Asian	0.717 **
Language Spoken at Home - English & One Other	0.463 ***
Language Spoken at Home - Other Languages	0.938
Other Latino Heritage (reference)	
Mexican Heritage	1.162
Demographics	
Self-Reported Age 18-25 (reference)	
Self-Reported Age 26-29	0.342 ***
Self-Reported Age 30-34	0.472 **
Self-Reported Age 35-39	0.787
Self-Reported Age 40-44	1.140 **
Self-Reported Age 45-49	1.358 ***
Self-Reported Age 50-54	2.125 ***
Self-Reported Age 55-59	2.778 ***
Self-Reported Age 60-64	3.526 ***
Self-Reported Age 65-69	5.089 ***

[4] *** = 99% or greater confidence that different than zero ($p < 0.01$), ** = 95 to 99% greater confidence that different than zero ($0.01<p < 0.05$), and * = 90 to 95% greater confidence that different than zero ($0.05<p < 0.10$).

Variable Name	Odds Ratio
Demographics	
Self-Reported Age 70-74	4.961 ***
Self-Reported Age 75-79	6.678 ***
Self-Reported Age 80-84	8.074 ***
Self-Reported Age 85+	7.155 ***
Family Status	
Single, no kids (reference)	
Single with kids	0.983
Married, no kids	1.927 ***
Married with kids	2.363 ***
Citizenship Status	
Non-Citizen (reference)	
US-Born Citizen	2.553 ***
Naturalized Citizen	2.345 ***
Lived in the U.S. < 5 Years (reference)	
Lived in the U.S. 5-9 Years	
Lived in the U.S. 10-14 Years	
Lived in the U.S. 15-19 Years	
Lived in the U.S. < 10 Years (reference)	
Lived in the U.S. 10-19 Years	0.992
Location	
Rural (reference)	
Urban	0.461 ***
Second City	0.929
Mixed	0.599 ***
Suburban	1.102
Town	1.158

Variable Name	Odds Ratio
Socio-Economic Status	
No Formal Education/Grade 1-8 (reference)	
Grade 9-12/High School Diploma	1.240
Some College	1.512 **
Vocational School	1.289
AA or AS Degree	1.415 *
BA or BS Degree	1.329 *
MA or MS Degree	1.419 **
Ph.D. or Equivalent Degree	1.490 **
Total Annual Income < $10,000 (reference)	
Total Annual Income $10,000 - $19,999	0.552 ***
Total Annual Income $20,000 - $29,999	1.058
Total Annual Income $30,000 - $39,999	1.452 **
Total Annual Income $40,000 - $49,999	1.406 **
Total Annual Income $50,000 - $59,999	1.716 ***
Total Annual Income $60,000 - $69,999	2.029 ***
Total Annual Income $70,000 - $79,999	2.595 ***
Total Annual Income $80,000 - $89,999	2.733 ***
Total Annual Income $90,000 - $99,999	2.567 ***
Total Annual Income $100,000 - $109,999	3.035 ***
Total Annual Income $110,000 - $119,999	4.455 ***
Total Annual Income $120,000 - $129,999	4.240 ***
Total Annual Income $130,000 - $139,999	5.355 ***
Total Annual Income $140,000 - $149,999	4.269 ***
Total Annual Income $150,000 - $159,999	5.359 ***
Total Annual Income $160,000 - $169,999	6.227 ***
Total Annual Income $170,000 - $179,999	3.930 ***
Total Annual Income > $180,000	5.709 ***
# of Observations	29,684,882
Pseudo R-Squared	0.275
Hit Ratio	78.71%

Table 8: Interaction effects between race/ethnicity and location[5]

Variables Tested	Odds Ratio	P-value
Native American & Urban	8.893	0.078 *
White American & Urban	1.099	0.348
Hispanic American & Urban	0.993	0.950
African American & Urban	0.932	0.744
Asian American & Urban	0.830	0.182
Other Race/Two or More Races & Urban	0.822	0.377
Native American & Suburban	1.000	NA
White American & Suburban	1.070	0.573
Hispanic American & Suburban	0.548	0.000 ***
African American & Suburban	1.510	0.188
Asian American & Suburban	1.565	0.015 **
Other Race/Two or More Races & Suburban	1.819	0.030 **
Native American & Rural	0.243	0.133
White American & Rural	1.280	0.253
Hispanic American & Rural	0.986	0.954
African American & Rural	0.981	0.975
Asian American & Rural	1.001	0.999
Other Race/Two or More Races & Rural	0.557	0.157
Native American & Mixed	0.226	0.131
White American & Mixed	1.065	0.666
Hispanic American & Mixed	1.078	0.660
African American & Mixed	0.807	0.556
Asian American & Mixed	0.708	0.267
Other Race/Two or More Races & Mixed	1.257	0.460
Native American & Town	0.461	0.505
White American & Town	1.111	0.454
Hispanic American & Town	0.953	0.776
African American & Town	0.518	0.136
Asian American & Town	1.605	0.246
Other Race/Two or More Races & Town	0.729	0.377
Native American & 2nd City	0.091	0.056 *
White American & 2nd City	0.333	0.000 ***
Hispanic American & 2nd City	2.532	0.000 ***
African American & 2nd City	1.300	0.509
Asian American & 2nd City	0.656	0.546
Other Race/Two or More Races & 2nd City	0.945	0.887

[5] *** = 99% or greater confidence that different than zero ($p < 0.01$), ** = 95 to 99% greater confidence that different than zero ($0.01 < p < 0.05$), and * = 90 to 95% greater confidence that different than zero ($0.05 < p < 0.10$).

VIII. Discussion

In this section, I interpret my logistic regression model findings. I discuss the results in the context of specific policy lessons learned and conclude with suggestions for further research.

Per the results in Table 6, I found that even after controlling for age, income, citizenship status, marital status, educational attainment, and location, substantial differences in homeownership still exist among different races/ethnicities in California. However, compared to my expectations in Table 2, some findings had different directions from what I anticipated. For instance, while I expected that those that speak Spanish and English or Chinese and English at home would be negative, they both turned out to be positive. Both of those have higher likelihoods of being a homeowner compared to those that speak English only. However, for the Hispanic American variable, since the results were not statistically significant, I could not conclude that there was a difference between their likelihood and the homeownership likelihood of white Americans. Moreover, while I expected those that speak English and another Asian language at home to have a higher likelihood to be homeowners, the results showed that they have a lower likelihood to be homeowners.

In contrast, the results matched my expectations for Asian Americans and African Americans. Asian Americans are 45% more likely to be homeowners compared to white Americans while African Americans are 49% less likely to be homeowners compared to white Americans. There was no statistically significant effect for Native Americans so I could not conclude that their likelihood was significantly different from white Americans. As for the influence of citizenship status, the results matched my expectations since native citizens and naturalized citizens have a higher likelihood of being a homeowner compared to non-citizens.

The likelihood also increases with marriage, and even more so with children. It decreases in urban and mixed locations compared to rural locations, though the results showed no statistically significant differences in the likelihood between rural and suburban, town, or second city locations.

Another clear trend is that the likelihood of homeownership tends to increase with age, income, and educational attainment. Based on the results from Table 8 in the appendix, the relative importance of variables such as age, marital status, and income can be compared. Age has the highest impact since by the 80-84 range, the odds of being a homeowner increase to 707% over the excluded age range of 18-25. The next two highest likelihoods belong to the Self-Reported Age 85+ variable and the Age 75-79 variable. Income also has a substantial impact since the odds of being a homeowner tend to increase with each $10,000 increase in income. In general, when listed from highest to lowest odds, variables related to age and income take up a third of the list starting from the top. As for family status, while being married with kids ranks relatively high compared to the rest of the variables, it ranks lower than top earners and people aged over 55 years. The likelihood of homeownership does not differ significantly between being single with no kids and being single with kids. However, the likelihood does go up significantly with marriage to 93% and to 136% when children are included.

One notable distinction is the difference within certain race/ethnicity groups. For example, while Asian Americans have a statistically significant 45% higher likelihood than white Americans to be a homeowner, those that speak Vietnamese or Korean at home have a statistically significant 70% and 61% lower likelihood of being a homeowner than those that only speak English. Since they only speak Vietnamese and Korean, it could be that they are more recent immigrants and thus, the strong negative effect could be due to their citizenship status.

However, it is not the only factor since those that speak English and another Asian language have a statistically significant 28% lower likelihood of being a homeowner than those who speak English only. On the other hand, those that speak Chinese and English at home have a statistically significant 63% higher likelihood of being a homeowner than those that speak English only.

The lesson for policymakers is that within these broad categories for race, there could be significant differences between ethnicities such as the broad differences between Asian American groups. For example, Kuebler's (2013) study found that Taiwanese immigrants have very high levels of homeownership despite low levels of income. Instead, they had high levels of wealth, educational attainment, and a strong preference for homeownership. Thus, while homeownership is often recommended by others as a way to build wealth, in this case, wealth was what allowed them to become homeowners. Moreover, in her book *Race for Profit*, author and activist Keeanga-Yamahtta Taylor (2021) writes how while many people advise homeownership as a means to escape poverty, not all people enter the housing market on equal terms. In addition, becoming a homeowner requires taking on a debt burden, maintenance of a structure, and does not necessarily lead to an increase in the home value as it could be in a neighborhood with few prospects. Taylor covers how the United States Department of Housing and Urban Development (HUD) and Federal Housing Administration (FHA) valued increasing homeownership over stability and led many low-income Americans, especially black Americans, to take on larger debt-burdens, but also properties undesirable to the general market. The FHA's staffing issues and failure to properly appraise the properties led to a string of defaults and with many low-income people losing their house, their savings, and the credit rating. Meanwhile, the Wisconsin branch of the FHA focused on quality over quantity and would be a good example for

policymakers looking to increase homeownership. Their regimen included financial counseling, classes on home maintenance, and a free set of tools as a gift for completing classes. In addition to that, Wisconsin counties agreed to provide funds for maintenance and repairs costs for homes for homeowners using the subsidy from FHA. It took greater resources and thus, churned out fewer homeowners, but these homeowners were able to keep their house for a longer time and thus, reap the benefits of homeownership.

Thus, in conclusion, focusing on the homeownership rate could obscure important differences or focus too much on increasing quantity over quality when it comes to policy. Building wealth through homeownership requires staying in the home for a certain time. Some groups, such as Taiwanese Americans, might require little assistance while others may require more assistance. The CHIS survey data did not provide a more detailed breakdown of ethnicities so another study would have to find a data source that includes more comprehensive demographic data. Moreover, this data focused on California, but there could be differences between states and cities within states as well. Aside from location and ethnicities, further studies should also some measure household wealth as this could account for a large portion of the gap. These studies could provide policymakers with data on how to tailor housing programs to answer any specific needs of different groups.

References

Alba, R. and Logan, J. (1992). Assimilation and stratification of homeownership patterns of racial and ethnic groups. *International Migration Review*, 26, 1314–1341.

Chakrabarty, D., Osei, M. J., Winters, J. V., & Zhao, D. (2018). Which immigrant and minority homeownership rates are gaining ground in the US? *Journal of Economics and Finance*, 43, 273-297.

Charles, K. K., & Hurst, E. (2002). The transition to home ownership and the black-white wealth gap. The Review of Economics and Statistics, 84(2), 281–297.

Coulson, N. E. (1999). Why are Hispanic- and Asian-American homeownership rates so low immigration and other factors. *Journal of Urban Economics*, 45, 209-227.

Desilva, S., & Elmelech, Y. (2012). Housing inequality in the United States: Explaining the white-minority disparities in homeownership. *Housing Studies*, 27(1), 1-26.

Gyourko, J., Linneman, P., & Wachter, S. (1999). Analyzing the relationship among race, wealth and home ownership in America. *Journal of Housing Economics*, 8(2), 63–89. https://doi.org/10.1006/jhec.1999.0242.

Linneman, P., & Wachter, S. (1989). The impacts of borrowing constraints on homeownership. *American Real Estate and Urban Economics Association Journal*, 17(4), 389–402.

McCabe, B. J. (2018). Why buy a home? Race, ethnicity, and homeownership preferences in the United States. Sociology of Race and Ethnicity, 4(4), 452-472.

McConnell, E. D. (2015). Hurdles or walls? Nativity, citizenship, legal status, and Latino homeownership in Los Angeles. *Social Science Research*, 53, 19-33.

Rothstein, R. (2018). *The color of law*. Liveright Publishing Corporation.

Shapiro, T. M. (2006). Race, homeownership, and wealth. *Washington University Journal of Law & Policy*, 20, 53-74.

Skobba, K. (2013). (rep.). *Understanding Homeownership Disparities Among Racial and Ethnic Groups*. Athens, GA: Minnesota Homeownership Center.

Sullivan, L., Meschede, T., Dietrich, L., Shapiro, T., Traub, A., Reutschlin, C., & Draut, T. (2015). *The Racial Wealth Gap: Why Policy Matters*. Demos. Retrieved March 30, 2022, from https://www.demos.org/research/racial-wealth-gap-why-policy-matters.

Taylor, K.-Y. (2021). *Race for profit: How banks and the real estate industry undermined black homeownership*. The University of North Carolina Press.

University of California Center for Health Policy Research. (2021). "CHIS 2020 Adult Public Use Files." https://healthpolicy.ucla.edu/chis/data/Pages/GetCHISData.aspx

Appendix

Table 9: Summary of literature review

Article Title	Author(s)	Sample Description	Dependent Variable	Explanatory Variables	Methodology	Findings
Why Are Hispanic- and Asian-American Homeownership Rates So Low?: Immigration and Other Factors	Coulson, N. E. (1999)	Current Population Survey from the Census Bureau for 1996 with 42,094 observations	Dummy variable for households that are owner-occupiers.	Income, educational attainment, location, family status, age, immigration status	Probit regression	Immigration has a substantial impact on homeownership rates for some race/ethnic groups since while it increased the predicted White American and Black American rates by 0.9% and 1% respectively, it lowered the predicted Hispanic American rates by 4.6% and Asian American rates by 7.9%.
Housing Inequality in the United States: Explaining the White-Minority Disparities in Homeownership	Desilva, S., & Elmelech, Y. (2012)	3-Year Sample of the American Community Survey (ACS) 2005-2007 with 2,648,397 observations	Dummy variable for households that own a home.	Race/ethnicity, socio-economic, demographic, immigration status, spatial location	Logistic regression	The study found that immigration controls explained between 6 and 10% of the white-minority homeownership gap for Asian Americans and Hispanic Americans. When controls are added for immigration and PUMA, most of the gap is dissappears except for African Americans and Puerto Ricans.
Hurdles or walls? Nativity, citizenship, legal status and Latino homeownership in Los Angeles	McConnell, E. D. (2015)	Los Angeles Family and Neighborhood Survey data in 2002 with 3,000 observations	Dummy variable for households that own a home.	Immigration status, citizenship, legal status	Logistic regression	Unathorized non-citizens is the subgroup least likely to own a home among Latinos as they face more barriers than other groups. Compared to a U.S. born Latino, the likelihood of homeownership for an authorized non-citizen immigrant is 89% lower.

Article Title	Author(s)	Sample Description	Dependent Variable	Explanatory Variables	Methodology	Findings
Which immigrant and minority rates are gaining ground in the US?	Chakrabarty, D., Osei, M. J., Winters, J. V., & Zhao, D. (2018)	2000 decennial census with 3,835,705 observations & American Community Survey (ACS) for 2001-2015 with 838,909 observations (2007) & 822,927 observations (2015)	Dummy variable for households that own a home.	Race, ethnicity, immigration status	OLS regression	From 2000 to 2015, the Asian immigrant coefficient went from -0.1421 to -0.089, the Hispanic immigrant coefficient went from -0.164 to -0.129, and the Asian native went from -0.008 to 0.000, making them the three top groups to have made gains in homeownership over fifteen years relative to non-Hispanic whites.
Assimilation and stratification of homeownership patterns of racial and ethnic groups	Alba, R. and Logan, J. (1992)	Public Use Sample Data (PUMS) from 1980 census	N/A	N/A	Assimilation and stratification analysis	Found that white Americans have the smallest disparity between low and high income earners. Also, white Americans are more responsive to the suburban housing market while minorities are more responsive to the central city market.
The transition to home ownership and the black-white wealth gap	Charles, K. K., & Hurst, E. (2002)	Panel Study of Income Dynamics (PSID) panel data from 1991 and 1996	Homeownership desire via proxy variable of mortgage application submittal	Race, income, demographics, tax information, location, rent, down payment requirement	Linear probability regression	Found that while black Americans are less likely to apply for a mortgage than white Americans, they are also twice as likely to get rejected. Moreover, part of this application gap is due to having less support from family members for a down payment.

Article Title	Author(s)	Sample Description	Dependent Variable	Explanatory Variables	Methodology	Findings
Analyzing the relationship among race, wealth and home ownership in America	Gyourko, J., Linneman, P., & Wachter, S. (1999)	Cross sections of FRB data from 1962 to 1983	N/A	N/A	Binomial logistic regression and a multinomial logistic regression	Found no difference in homeownership rates between households with sufficient wealth to meet down payment but substantial differences in low wealth households. Moreover, even minority households not constrained by wealth are more likely to live in central city locations.
The impacts of borrowing constraints on homeownership	Linneman, P., & Wachter, S. (1989)	Federal Reserve Board's Survey of Consumer Credit (1977, 735 observations) and Survey of Consumer Finances (1983, 511 observations)	Homeownership	Permanent income, age, race, household composition, income constraints, wealth	Logistic regression	Wealth and income constraint the homeonwership rate, but wealth is the stronger constraint.

Table 10: 90% Confidence Intervals for all Statistically Significant Explanatory Variables (in order of absolute value from highest to lowest)

Variable Name	Odds Ratio	90% Confidence Interval		
Self-Reported Age 80-84	8.07	5.96	to	10.94
Self-Reported Age 85+	7.16	5.14	to	9.95
Self-Reported Age 75-79	6.68	5.17	to	8.63
Total Annual Income $160,000 - $169,999	6.23	4.20	to	9.23
Total Annual Income > $180,000	5.71	4.43	to	7.35
Total Annual Income $150,000 - $159,999	5.36	3.75	to	7.66
Total Annual Income $130,000 - $139,999	5.36	3.09	to	6.13
Self-Reported Age 65-69	5.09	4.15	to	6.24
Self-Reported Age 70-74	4.96	4.02	to	6.12
Total Annual Income $110,000 - $119,999	4.45	3.39	to	5.85
Total Annual Income $140,000 - $149,999	4.27	2.90	to	6.29
Total Annual Income $120,000 - $129,999	4.24	3.08	to	5.83
Total Annual Income $170,000 - $179,999	3.93	2.17	to	4.41
Self-Reported Age 60-64	3.53	2.87	to	4.34
Total Annual Income $100,000 - $109,999	3.03	2.24	to	4.12
Self-Reported Age 55-59	2.78	2.28	to	3.38
Total Annual Income $80,000 - $89,999	2.73	1.98	to	3.77
Total Annual Income $70,000 - $79,999	2.60	2.04	to	3.31
Total Annual Income $90,000 - $99,999	2.57	1.90	to	3.48
US-Born Citizen	2.55	2.04	to	3.20
Married with kids	2.36	2.05	to	2.73
Naturalized Citizen	2.34	1.85	to	2.97
Self-Reported Age 50-54	2.13	1.70	to	2.65
Total Annual Income $60,000 - $69,999	2.03	1.56	to	2.64
Married, no kids	1.93	1.74	to	2.13
Total Annual Income $50,000 - $59,999	1.72	1.32	to	2.23
Language Spoken at Home - English & Chinese	1.63	1.14	to	2.34
Some College	1.51	1.16	to	1.97
Ph.D. or Equivalent Degree	1.49	1.08	to	2.06
Total Annual Income $30,000 - $39,999	1.45	1.14	to	1.85
Asian American	1.45	1.21	to	1.74
MA or MS Degree	1.42	1.07	to	1.88
AA or AS Degree	1.42	1.07	to	1.88
Total Annual Income $40,000 - $49,999	1.41	1.08	to	1.82
Self-Reported Age 45-49	1.36	1.14	to	1.62
Language Spoken at Home - English & Spanish	1.34	1.14	to	1.58
BA or BS Degree	1.33	1.03	to	1.71

Variable Name	Odds Ratio	90% Confidence Interval		
Other Race/Two or More Races	0.82	0.68	to	1.00
Self-Reported Age 35-39	0.79	0.65	to	0.96
Language Spoken at Home - English & European	0.74	0.56	to	0.99
Language Spoken at Home - English & Other Asian	0.72	0.56	to	0.92
Mixed	0.60	0.50	to	0.72
Total Annual Income $10,000 - $19,999	0.55	0.42	to	0.72
African American	0.51	0.42	to	0.61
Self-Reported Age 30-34	0.47	0.38	to	0.58
Language Spoken at Home - English & One Other	0.46	0.30	to	0.71
Urban	0.46	0.39	to	0.54
Language Spoken at Home - Korean	0.39	0.22	to	0.69
Self-Reported Age 26-29	0.34	0.27	to	0.44
Language Spoken at Home - Vietnamese	0.30	0.16	to	0.55
Language Spoken at Home - One Other Language	0.27	0.20	to	0.36