

**Housing Quality Gap for Minorities and Immigrants in the U.S.: Evidence
from the 2009 American Housing Survey**

KusumMundra*
Department of Economics
Rutgers University, Newark
Ph: 973-353-5350
Fax: 973-353-5819
kmundra@andromeda.rutgers.edu

and

Amarendra Sharma
Department of Economics
Elmira College, Elmira, NY
asharma@elmira.edu

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*Corresponding author

Abstract

Using the data from the national American Housing Survey for the year 2009 this paper examines the housing quality gap for minorities and immigrants. Using logit model this paper finds that there is a significant quality gap for Blacks and Hispanics when compared to whites in the U.S. but not for immigrants relative to natives. The home quality has not changed over time among the homeowners in the U.S. However for immigrant homeowners the home quality dropped during the 1980s, potentially due to amnesties and low skilled immigration. We also find evidence that naturalization improves housing adequacy among immigrant homeowners.

JEL Classifications:R2, J15

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1. Introduction

Provision of adequate housing is an important issue and has been declared such by many international instruments including the Universal Declaration of Human Rights, which states (article 25(1)): “Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.”

On the other hand, the International Convention on the Protection of the Rights of all Migrant Workers and Members of their Families (article 43(1)(d) states that “Migrant worker shall enjoy equality of treatment with nationals of the state of employment in relation to...[a]ccess to housing, including social housing schemes, and protection against exploitation in respect to rents.”

These international declarations notwithstanding, we still observe significant proportion of people living in inadequate housing in many countries including the richest in the world. It is therefore not surprising to learn that out of approximately 55.4 million people who live in the rural United States comprising 22% of all homes in the country, approximately 30% of these rural homes (23 million) have at least one major problem, and over 660,000 homes have two or more housing problems (Housing Assistance Council, 2002 report). According to the United States Department of Agriculture, the homes in the rural areas, whether owner or rental structure, have higher rates of physical inadequacies than the homes in the urban areas, but tend to be less crowded. This housing issue assumes an added dimension when we consider the demographic makeup of the U.S., which has seen a steady growth in the population of immigrants in particular and minorities in general. In spite of this shift of the demographic forces towards the minorities,

who traditionally have lower homeownership rates than the whites, the homeownership rates in the U.S. saw a jump of 4.6 percentage points during the recent housing boom (Nations' Housing Outlook 2010). This observed increase can primarily be attributed to the household income growth and low interest rates. A report from the Pew Hispanic Center showed that from 1994 onwards home ownerships have also increased dramatically for the minorities and the immigrants (Kochar et al. 2009).

There is a vast literature examining the homeownership outcome for minorities and immigrants, but the housing literature has not adequately examined home quality gap for both minorities and immigrants. In this paper, our main focus is to use the national level American Housing Survey for the year 2009 and estimate the homeownership quality gap for minorities and immigrants. This paper will examine whether home adequacy increased for minorities and immigrants during the recent housing boom?

Earlier literature on this issue has found that housing quality does vary by race and nativity in the U.S. Kutty (1999) while examining the determinants of structural adequacy of dwellings using the metropolitan 1991 AHS data concludes that "significant disparity in housing quality exists across metropolitan areas and population groups by race, household type, tenure, and central city or suburban location".

Grisby and Bourassa (2004) use data from the 2001 American Housing Survey and find that the new immigrant households are more likely to be crowded, though blacks and Hispanic households, regardless of the nativity status, are more likely to live in poor quality housing.

The contribution of this paper is three folds. First, we use the data from the AHS (2009) at the national level to examine the housing quality gap for minorities and immigrants. Second, we use the variable - the year the mortgage was obtained - to examine how the housing quality gap has

changed over time for homeowners in the U.S.. It is important to understand, not only whether the minorities and immigrants are able to buy their first home, but also how the quality of home they purchased changed over time. Third, for the immigrant homeowners we examine the role of the naturalization in improving adequacy of the homes.

Academic literature on housing has explored in detail the realization of American dream of homeownership for immigrants and minorities. However, not much work has been done on the quality of the housing and how it has changed over time. Our paper aims to fill this gap. Using the 2009 American Housing sample this study will answer some of the pertinent questions that have not been adequately addressed by the literature on the housing quality gap across minorities and immigrant groups.

II. Background Literature on the Housing Quality in the U.S.

A plethora of research has been done on the quality of housing in the United States. Some of the issues related to the quality of housing that have been discussed in the literature are how to measure housing quality, what determines housing quality, and how home prices relate to housing quality. Researchers agree that the measure of housing quality must be multidimensional and ought to include a measure of structural adequacy, a measure of neighborhood quality that emphasizes safety, access to work and other amenities, a measure of crowding in the house, and certainly affordability.

For example, after analyzing AHS data, Goedert and Goodman (1977) and Wieand and Clemmer (1977) find that no single measure of housing inadequacy serves as a good proxy for housing quality as they are weakly correlated with other measures of structural deficiency or the household characteristics.

In another study, Goodman (1978) considers three indicators of housing quality, namely, financial burden, crowding, and unit and neighborhood quality scores based on a hedonic index. The determinants of these quality indicators in his study are primarily demand side variables such as income, family size, race, and education. Kutty (1999) does a similar study using the AHS data, but she includes both demand and supply side determinants in her analysis. She, in addition to the above mentioned variables, includes age of the building, type of the structure, tenure, elderly status of the residents, and vehicle ownership as the determinants of housing quality.

Goedert and Goodman (1977) find that dwellings in the rural areas are more likely to suffer from structural deficiencies than the urban areas, and also the rental homes tend to be more structurally deficient than the owner occupied dwellings.

Spain (1990) in her multivariate study uses crowding as an indicator of housing quality and finds that a dwelling is more crowded if the household is married, have children, and resides in the central city. On the other hand, income is inversely related to crowding.

Weicher and Thibodeau (1988) find that the likelihood of residing in low quality housing increases with one's racial minority status and being unmarried. Whereas, being married, low vacancy, and new construction are associated with lower odds of living in low quality housing. They do not find any evidence to suggest that the construction of subsidized housing for poor results in a reduction of the occurrence of low quality housing.

There are several studies that discuss the appropriate indicators of housing quality. Goedert and Thibodeau (1977) do not use any predetermined measure of housing quality in their study, rather they rely on those indicators of housing deficiency that have significant inverse relationship with the household income. This criterion allowed them to choose indicators such as lacking electric

outlets in one or more rooms, absence of plumbing facility, presence of mice and rats, and leaky roofs.

Kain and Quigley (1970) use factor analysis to aggregate variables to represent housing quality into five factors. These factors are: basic residential quality, dwelling unit quality, proximate unit quality, non-residential use, and average structure quality. A study by HUD (1978) defines inadequate housing. Accordingly, if a dwelling lacks one or more of the structural features such as sewage, kitchen, plumbing, heating, public hall, toilet access, and electrical fittings, then it's considered inadequate. This definition has been used by several studies including Weicher and Thibodeau (1988), Weicher, Yap, and Jones (1982), Newman and Schnare (1988), Newman and Struyk (1983), Bianchi, Farley, and Spain (1982), and Kutty (1999).

Cook & Bruin (1994) examine the determinants of housing quality for White, Hispanic, and African-American single parent women. Their study uses three indicators of housing quality; viz., Affordability, Crowding, and Satisfaction. They find that white single women fared better than their Hispanic or African-American counterparts in terms of living in a better quality home. The Hispanic single mother household was more crowded and incurred greater housing related costs than the other groups. The African-American single mothers were more likely to live in substandard housing and more dissatisfied relative to the other groups.

Choi (1999) using the 1991 wave of the American Housing Survey data examines the determinants that predict the quality of housing headed by people older than 65 years in age. The finding suggests that older minority women are more likely to live in a deficient house than the older white females.

Boehm (1995) compares the costs and the perceived quality of owned manufactured homes with the traditional rented and owner occupied homes by using data from the American Housing

Surveys of 1985-1989. He finds that the manufactured homes compare well with the traditional ones because of its low cost and perceived better structural quality. He also looks at specific structural attributes in influencing the household's perceived ordinal rankings of the structural quality of homes and finds that the same attributes play a role across all tenure types.

Markham and Gilderbloom (1998) examine the determinants of housing inadequacy for the elderly and find that the region where the person lives and the race are the most important predictors. They also find that the tenure and the gender of the elderly person also predict the housing inadequacy. Other factors that they identify to be associated with housing inadequacy among elderly are: being black, living in the south, living alone, and being a renter.

In this paper we use the recent national level 2009 AHS to not only examine the housing adequacy gap for blacks and Hispanics but also for the immigrants. To the best of our knowledge, the literature, so far, has not focused on the immigrant housing in the U.S. We further contribute to the home quality literature by examining the changes in the housing adequacy for homeowners over time. It is well known that in spite of the increases in homeownership for all demographic groups in the U.S., the homeownership gap has persisted for the minorities and immigrants. However, it is not well known whether the home adequacy is increasing for all and how it is changing for the minorities and immigrant homeowners. This paper further contributes to the literature by examining the housing adequacy for female household heads and for the naturalized vs. the non-naturalized immigrants.

III. Data

This paper uses data from the AHS 2009. The AHS is a biennial national housing survey conducted by the Bureau of the Census for the Department of Housing and Urban Development (HUD).¹ The AHS is the only national sample which collects data on various quality indicators

and detail information on the physical unit and so has been the principal data source for housing quality for the U.S. The AHS gives rich information on the households' demographic characteristics, race, immigrant characteristics, homeowner's mortgage information and neighborhood characteristics. Since in the national sample we can identify the region, SMSA, and whether the unit is in the urban area or not, we can control for this level of geography in our analysis. It is well known that housing quality decreases in urban areas relative to the other areas. We restrict the analysis to household heads between the ages of 25 and 65 years old. Our focus with regards to minorities is on Hispanics and blacks, and immigrants are identified by household heads born outside of the U.S. to non-American parents.²

We use the multidimensional quality index ZADEQ recorded in the AHS for our quality measure. This index has been previously used in many studies (see for example, Kutty, 1999; Lu, 1999; Hadden & Lager, 1990). We reclassify the three levels of adequacy in the index to a binary measure (Binadequacy) that takes value 1 when ZADEQ = 1 (housing quality is adequate) and zero when the ZADEQ = 2 or 3 (quality is moderately inadequate or severely inadequate). The details of the housing adequacy measure are provided in the Appendix. From the summary data in Table 1 we find that 68% of the household heads are homeowners and 47% are the first time homeowners. A very high proportion at 95% has adequate housing, and 27% say that they have moderate neighborhood satisfaction. Thirty-nine percent of the homes are more than twenty five years old and 67% of the units are single family homes. Seventy percent of the households report that they enjoy high neighborhood satisfaction, whereas, 7% of the units have abandoned buildings in the neighborhood. The average length of tenure is around 11 years and the average room density is around 3 persons per room.

Sixty percent of the households are married and 43% have female heads. Sixty nine percent of the households are non-Hispanic whites and 12% are blacks and 13% Hispanics. Fifteen percent of the households are immigrants and the average time they have spent in the U.S. is around twenty years. Forty six percent of the immigrant households have naturalized. Eighty two percent own cars and twenty five percent have assets. Thirty four percent are college graduates and the average monthly household income is around \$6,609. Twenty three percent of the units are located in the Northeast, twenty six percent in the Midwest, twenty percent in the West, and thirty two percent in the South.

When we compare the means across various groups (presented in Table 3), we find that a significantly higher proportion of immigrants compared to natives have adequate housing in the U.S. Similarly a significant proportion of whites live in adequate housing compared to blacks and Hispanics. What is the trend of housing quality for the first homeowners in the U.S.? AHS collects data on the year when the first mortgage was obtained and we assume it to be the same year as when the home is purchased. We divide the year of first mortgage into four periods – pre 1980, 1981 – 1990, 1991 – 2000, and 2001 – 2009. The first time homeowners who bought homes before 1980 showed a higher housing quality index than the homeowners who bought after 1980s. This result is statistically significant at the 10% level. We also find that the homeowners who bought homes during the 1991 – 2000 period report living in a significantly adequate housing relative to those who bought during 2001 – 2009 period. It is quite possible that the push towards homeownership during the subprime boom periods pushed people towards higher homeownership even if the quality was not adequate.

IV. Empirical Model

The empirical models are based on logit models of housing adequacy given as follows:

$$\text{Binadequacy}_i = f(X_i, Z_i) \quad (1)$$

where the vector X includes controls for the demand and supply side of the adequacy index and Z contains the relevant minority and immigrant status dummy variables. $\text{Binadequacy} = 1$ if $y > 0$, where y is an unobservable latent variable specified as follows:

$$y = \beta_0 + X\beta_1 + Z\beta_2 + \varepsilon \quad (2)$$

and ε follows a logistic distribution $G(\cdot)$. So the

$$\text{Probability}(\text{Binadequacy} = 1 | X_i, Z_i) = G(\beta_0 + X\beta_1 + Z\beta_2) \quad (3)$$

where Z includes the dummy variables Black_i , Hispanic_i , and Immigrant_i

The vector X includes both demand and supply side determinants of housing adequacy. On the demand side determinants of housing adequacy we include variables such as the education of household head and household income. Generally, the higher the level of education and household income the greater is the chance of a household living in an adequate home. Following Kutty (1999) we proxy permanent income by including asset and car ownership by the household. We also include whether the household owns or rents, presence of children below 18 years of age, as well as the number of children. We control for other demographic factors such as the marital status and gender of the household head. We also control for how satisfied the household head is with the neighborhood they live in. If the individuals are satisfied with the neighborhood then their demand for more adequate housing will be higher. However, there is

also a possibility that if the household head, particularly the renters, are very satisfied with the neighborhood then they might be willing to substitute the lower quality housing with the better neighborhood quality.

On the supply side determinants of housing adequacy in vector X in model 1 we include variables such as the age of the building and whether the unit is a single family or multi family. Multifamily and older units are more likely to be inadequate than the single and newer units. We also include a few geographical controls such as whether the unit is in the urban area, central city, and controls for various regions. Housing in central city is often overcrowded than the suburban areas and therefore the homes would tend to have lower adequacy index than the suburban areas.

To examine the housing quality gap for Hispanics and Blacks we include a dummy variable capturing the ethnicity of the household in model 1. We also include a dummy variable to capture the immigration status of the household head. In another specification we estimate model (2) for the immigrants only and include a naturalization dummy and the number of years the immigrants have lived in the U.S. Similar to the homeownership argument, the longer the immigrants have lived in the U.S. the more assimilated they tend to become, resulting in them being on an upward income trajectory (Borjas 1994; Chiswick 1978; Chiswick and Miller 2000). Thus, one would expect that with greater assimilation coupled with better information about the housing market and higher earnings, the immigrants can afford to live in better quality homes. Although, it is also possible that with the increased immigration during the 1970s and 1980s more immigrants settled in the central city, particularly in the immigrant gateway cities, compared to the newer arrivals, which might have lowered the adequacy and quality of housing for immigrants as a function of the number of years lived in the U.S.

To further examine the quality gap for immigrants we estimate the following model for immigrant sample and control for their years in the U.S. and whether they are naturalized or not:

$$\text{Probability (Binadequacy} = 1 / X_i, Z_1) = G(\beta_0 + X\beta_1 + Z\beta_2) \quad (4)$$

Where $Z = \text{Black}_i, \text{Hispanic}_i, \text{Years in the US}_i, \text{Naturalized}_i$

To examine the housing quality gap for homeowners given when they bought their homes we estimate a logit model only for the homeowners and include the time period when the first-home was bought. The AHS collects data on the year the mortgage was obtained, which we assume is also the year the home was bought. For the homeowners we estimate a similar model given by equation (3) and include the decade when the home was bought.

V. Results

Next, we discuss the results from our analysis of the various model specifications mentioned above.

A. Home Quality gap for minorities and immigrants

Table 4 presents the estimation results from the logit model given by equation (2). We find that the Blacks and Hispanics have lower likelihood of living in an adequate quality home than the whites. The odds ratio suggests that the Blacks have 24% and Hispanics 12% lower likelihood of living in an adequate quality home compared to the whites and the results are statistically significant at 1% for Blacks and at 10% for Hispanics. The other variables have expected signs. We find that household heads with college education and higher incomes have greater likelihood of living in an adequate quality house. Individuals who own a car have a 1.30 times higher likelihood of living in an adequate housing than the non-car owners. House owners have a 1.51

time higher likelihood of living in an adequate housing than the renters; though, we find that the length of ownership is inversely related to the likelihood of a household reporting living in an adequate housing.

The other variables also exhibit expected signs. Married household heads have a higher likelihood of living in adequate housing than widowed and single household heads. Individuals living in moderate and low neighborhood satisfaction areas have a lower likelihood of living in high quality housing than the households with high neighborhood satisfaction areas. It is not surprising that individuals living in a single family detached homes show a higher housing adequacy than multifamily units. Also, mobile homes and abandoned units have lower adequate housing than other units.

Previous literature on gender homeownership gap has shown that women have significantly lower homeownership rates than men (Sedo and Kassoudji 2004). We find that the female headed households show 1.16 times higher likelihood of living in an adequate housing than the male headed households, and the result is statistically significant at the five percent level. This finding on home quality is contrary to that of homeownership. The households with female heads show a higher adequacy than their male counterparts and are in contrast to the gender gap in homeownership.

The results with the immigrant dummy in model 2 are given in Table 4 columns 4 & 5. We find that the immigrants and natives do not have any statistically significant quality gap. Though, when we estimate the model given by equation (4) for immigrant only sample, displayed in table 5, we find that the naturalized immigrants have 1.30 times higher likelihood of living in adequate housing than the non-naturalized immigrants and this result is statistically significant at the 10%

level. This result holds even when we account for the immigrant assimilation in the U.S. In fact, the number of years in the U.S. lowers the likelihood of adequate housing. Naturalization signals permanence for immigrants in their new destination countries and often signals less spatial mobility and a higher likelihood of homeownership. All the above factors tend to improve the adequacy of housing and thus naturalization lowers the home quality gap for the immigrants.

B. Home Quality Gap over Time for Homeowners

The results from the logit model of home adequacy for homeowners given by equation (5) are reported in Table 6.³ For overall sample we do not find any statistically significant difference in the housing adequacy between the households who bought homes during the period 1991 – 2000 relative to those who bought homes during 1981 – 1990. However, the quality of housing does significantly vary over time for immigrant homeowners. From the immigrant sample we find that the households who bought their first home before 1980 have a lower likelihood of living in an adequate house than the households who bought during the 1981 – 1990 period. However, the households who bought homes during the 1991 – 2000 have a 1.99 times higher likelihood and the ones who bought in the year 2001 – 2009 have a 3.5 times higher likelihood of adequate housing than the reference group of 1981 – 1990.

So what was going on for the immigrant household homes before and during the 1980s? Immigration in the U.S. during the 1970s and 1980s was primarily driven by the low-skilled agricultural workers from Mexico and under the Bracero programs they were also naturalized in unprecedented numbers during the IRCA amnesty of 1986. In this way the eighties are very different for immigrants in the U.S. compared to the nineties or earlier period. During the nineties there was relatively more high-skilled immigration fueled by the high-tech boom in the

U.S. which was not seen in the eighties. Eighties in the U.S. saw a huge influx of naturalized less skilled immigrants in the U.S. who might have been potentially driven towards homeownerships, even if the quality of homes was not high. When we add the decade dummies in the immigrant sample we find that naturalized is insignificant.

For first homeowners we find that blacks live in a significantly lower quality homes than the whites. Hispanics also live in less adequate homes though it is significant only at the 10% level. This also works as robustness for the home quality gap for the entire sample in Table 4. As expected the household income raises the chance of living in an adequate home, whereas the multifamily units and abandoned buildings lower it. Multi-family units have lower adequacy and so does the units located in the central city.

A surprising finding for the immigrant sample is that car ownership lowers home adequacy for immigrant homeowners. One possibility is that car is a competing asset for immigrants and hence having a car lowers the quality of house the immigrants can afford. We do find that once we control for the timing of the purchase of the house by the immigrant, thenaturalization factor has no effect on home adequacy. Again, given that the eighties was the period when there were significant naturalizations in the U.S., it is possible that controlling for the decade dummy in the logit model of home adequacy renders the naturalization dummy insignificant.

VI. Conclusions and Summary of Findings

Given the significance of homeownership in individual wealth creation and in the household's integration into the society, there has been a big push towards encouraging homeownership in the U.S. In addition, given the homeownership gap for minorities and immigrants, the U.S. Government has taken many policy measures to encourage homeownership for the low income

households. There is a vast literature on minorities and immigrant homeownership in the U.S. but the literature is weak on the home quality and home adequacy gap for various groups in the U.S. This paper aims to fill this gap in the literature.

Using the national sample of 2009 AHS and the adequacy index, the main findings of this paper are that there is a significant home adequacy gap for blacks and Hispanics compared to the whites. However, there is no home adequacy gap for the immigrants compared to the natives. In this paper we also find several additional interesting results. (1) Female headed households are more likely to live in an adequate house than the male headed households (2) Naturalized immigrants tend to live in better quality homes than the non-naturalized immigrants. (3) Immigrants who bought their homes during and before eighties tend to live in poor quality homes than the immigrants who bought in either nineties or the two thousands.

How has the home quality changed in the U.S. over time for the homeowners? We find that for overall sample there is no significant change in the home quality. Whereas, for the immigrant sample we find that the households who bought their first home before 1980 have a lower likelihood of living in an adequate house than the households who bought during the 1981 – 1990 period. However, the households who bought homes during the 1991 – 2000 have a 1.99 times higher likelihood and the ones who bought in the year 2001 – 2009 have a 3.5 times higher likelihood of adequate housing than the reference group of 1981 – 1990.

The variable ZADEQ to measure home adequacy, however, is not without some limitations. As Eggers & Moumen (2013) point out that “this variable is oriented toward the lowest level standard of housing adequacy. It uses a limited three point scale, contrasting adequate housing with two levels of inadequacies. The ZADEQ scale does not offer any levels of

contrast in housing that is deemed adequate.”According to them “the analysts could make use of a housing quality index that would account for more quality related features and provide a wide range of outcomes, especially for housing deemed adequate.”.. In spite of this caveat ZADEQ has been widely used in the literature, since it gives a potential lower level of threshold on adequacy.In the future, we intend to analyze home adequacy using some alternative measures such as the poor quality index (PQI) developed by Eggers & Moumen.

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End Notes

1. <http://www.census.gov/hhes/www/housing/ahs/ahs.html>).
2. Asians are also a significant category for understanding immigrant and minority homeownership in the U.S., but we had to exclude this group from the present analysis due to small sample size.
3. We can only do this analysis for homeowners since for this group we know the year they obtained the mortgage. This analysis also serves as robustness for our results for the overall sample where homeownership might be endogenous to the adequacy measure.

Appendix

ZADEQ is a three level index of the multidimensional standards of adequacy. The three levels are

(1) adequate, (2) moderately inadequate, and(3) severely inadequate. In this paper we convert ZADQ to a binary measure and define a unit as adequate if ZADEQ is adequate at the first level and inadequate if ZADEQ is at the second or third level.

The AHS codes ZADEQ as severely inadequate if the unit meets just one of the following conditions:

- Unit has less than 2 bathrooms and the unit has at least one of the following:

Unit does not have hot and cold running water

Unit does not have a bathtub or shower

Unit does not have a flush toilet

Unit shares plumbing facilities

- Unit was cold for 24 hours or more and there have been
More than two breakdowns of the heating equipment that lasted longer than 6 hours
- Electricity is not used
- Unit has exposed wiring and not every room has
Working electrical plugs and the fuses have blown more than twice

Additionally, ZADEQ is coded moderately or severely inadequate using the following criteria:

Determine how many of the following conditions the unit meets:

- Unit has had outside water leaks in the last 12 months
- Unit has had inside water leaks in the last 12 months
- Unit has holes in the floor

- Unit has open cracks wider than a dime
- Unit has an area of peeling paint larger than 8x11
- Rats have been seen recently in the unit

If the unit meets 5 or 6 of the conditions, then ZADEQ is coded 3 meaning the unit is severely inadequate

If the unit meets 3 or 4 of the conditions and has not been identified as being severely

inadequate, then ZADEQ is coded 2 meaning the unit is moderately inadequate

If the unit has not been identified as being severely inadequate and meets one of the following conditions:

There have more than two breakdowns of the toilet that lasted longer than 6 hours

The main heating equipment is unvented room heaters burning kerosene, gas, or oil

The unit is lacking complete kitchen facilities

Then ZADEQ is coded 2 meaning the unit is moderately inadequate

Table 1 Variable Description

Variable	Description
Education	
lthhsch	Less than high school
somecol	High School but less than College
college	College Graduate
Income and Wealth	
hhldinc	Annual Household Income
carown	Car or Vehicle owner
debt	Household Debt
asset	Household Assets
Family and Related	
prchild	Presence of young children (< 18 years old)
children	Number of young children (< 18 years old)
femalehead	Female Head
mar	Married
widowed	Widowed
nevmar	Never Married
Race	
whitenonhispanic	Non-Hispanic White Household
blacknonhispanic	Non-Hispanic Black Household
hispanic	Hispanic Household
othernonhispanic	Other Non-Hispanic Household
Neighborhood Quality	
neighsatis~h	High Neighborhood Satisfaction
neighsatis~d	Moderate Neighborhood Satisfaction
neighsatis~w	Low Neighborhood Satisfaction
aban	Abandoned Buildings in the Neighborhood
Age of Building	
H0old	Building less than or equal to one year old
H5old	Building is one to five years old
H10old	Building is five to ten years old
H25old	Building is 25 or more years old
Unit Type and Related	
sfat	Unit type is single family, attached
sfdet	Unit type is single family, detached
mf20	Unit type is multi family, with less than or equal to 20 units
mf21	Unit type is multi family, with greater than 20 units
mh	Unit is mobile home
roomden	Room density (rooms per person)
ltenure	Length of tenure in years
Immigration status	
immigrant	Immigrant Household
naturalized	Immigrants who have US Citizenship
timeus	Time spent in the US
Location	
centralcity	Central City
urban	Urban
Northeast	Northeast Region
Midwest	Midwest Region
West	West region
South	South Region
Ownership	
own	Homeownership
firstown	First homeownership
yearfirst~t	Year first home is bought
Adequacy	
zadeq	House Adequacy Index
Binadequacy	1=Adequate quality, 0=inadequate quality

Table 2: Descriptive Statistics

Variable	Mean	Standard deviation	Observation	Minimum	Maximum
lthhsch	0.11	0.31	38804	0	1
somecol	0.55	0.5	38804	0	1
college	0.34	0.47	38804	0	1
Hhldinc*	6,609.43	6149,07	38804	-2248	71070
carown	0.82	0.38	38804	0	1
debt	-5.58	288.7	38804	-26976	0
asset	0.25	0.43	38804	0	1
prchild	0.42	0.49	38804	0	1
children	0.8	1.14	38804	0	9
femalehead	0.43	0.5	38804	0	1
mar	0.6	0.49	38804	0	1
widowed	0.22	0.41	38804	0	1
nevmar	0.19	0.39	38804	0	1
whitenonhisp	0.69	0.46	38804	0	1
blacknonhisp	0.12	0.32	38804	0	1
hispanic	0.13	0.34	38804	0	1
othernonhisp	0.06	0.24	38804	0	1
neighsatis~h	0.7	0.46	37521	0	1
neighsatis~d	0.27	0.45	37521	0	1
neighsatis~w	0.02	0.15	37521	0	1
aban	0.07	0.25	37798	0	1
H0old	0.01	0.1	38804	0	1
H5old	0.07	0.25	38804	0	1
H10old	0.07	0.25	38804	0	1
H25old	0.39	0.49	38804	0	1
sfat	0.06	0.24	38804	0	1
sfdet	0.67	0.47	38804	0	1
mf20	0.17	0.37	38797	0	1
mf21	0.05	0.23	38804	0	1
mh	0.04	0.2	38804	0	1
roomden	2.62	1.47	38804	0.22	15
ltenure	11.09	9.23	38804	0	79
immigrant	0.15	0.36	38804	0	1
naturalized	0.46	0.50	38804	0	1
timeus	19.97	12.03	5980	0	63
centralcity	0.29	0.45	38804	0	1
urban	0.74	0.44	38804	0	1
own	0.68	0.46	38804	0	1
firsttown	0.47	.50	24060	0	1
yearfirsth~t	1996.6	10.0	11327	1930	2009
Northeast	0.23	0.42	38804	0	1
Midwest	0.26	0.44	38804	0	1
West	0.2	0.4	38804	0	1
South	0.32	0.47	38804	0	1
zadeq	1.07	0.31	38804	1	3
Binadequacy	0.95	0.22	38804	0	1

*Monthly household income in the AHS includes debt. So some households have negative income.

Table 3: Adequacy of Homeownership - Binadequacy

Variable	Observations	Mean	t-statistic
Natives	32824	.9523824	
Immigrants	5980	.9384615	4.1896***
Whites	26684	.961475	
Hispanics	5211	.9286126	8.7479***
Whites	26684	0.961475	
Black Non-Hispanics	4566	.9104249	11.6346***
<i>First Homeowners</i>			
Home bought in 1980 or before	1168	.9486301	1.6902*
Home bought after 1980	10159	0.960036	
Home bought during 1981-90	1605	.953271	
Home bought after 1990	36031	.950154	0.5780
Home bought during 1991-2000	3363	.9616414	
Home bought during 2001-2009	32668	.9489715	3.5902***

*** denotes significant at 1%, ** denotes significant at 5%, * denotes significant at 10%

Table 4: Logit Regression Results of Home Quality for all sample

Variables	Coefficient	Odds Ratio	With Immigrants		Variables	Coefficient	OR	With Immigrants	
			Coefficient	Odds Ratio				coefficients	OR
blacknonhispanic	-.2793*** (.0728)	.7563 *** (.0551)	-.2832*** (.0730)	.7533*** (.0550)	H0old	.6856628 * (.386852)	1.985* (.7679)	.6938* (.3870)	2.0013* (.7745)
hispanic	-.1271* (.0744)	.8805* (.0655)	-.1687** (.0825)	.8447* (.0697)	H5old	.9522*** (.1782)	2.5915*** (.4619)	.9533*** (.1782)	2.5944*** (.4624)
othernonhispanic	-.0526 (.1049)	.9486 (.0995)	-.0926 (.1107)	.9114 (.1009)	H10old	.7836*** (.1532)	2.1894*** (.3355)	.7848*** (.1532)	2.1921*** (.3358)
immigrant			.0931 (.0776)	1.0976 (.0852)	sfat	.1345 (.1223)	1.1439 (.1399)	.1316 (.1223)	1.1407 (.1395)
somecol	.1351* (.0719)	1.1447* (.0823)	.1447 ** (.0721)	1.1557** (.0834)	mf20	-.6442*** (.0815)	.5250*** (.0427)	-.6511*** (.0815)	.5214*** (.0425)
college	.0907 (.0880)	1.095 (.0964)	.0956 (.0880)	1.1003 (.0968)	mf21	-.6661*** (.1025)	.5136*** (.0526)	-.6745*** (.1028)	.5093*** (.0523)
hhldinc	.0047*** (.0008)	1.0047*** (.0008)	.0047*** (.0008)	1.0047*** (.0008)	mh	-.5876*** (.1107)	.5556*** (.0615)	-.5878*** (.1107)	.5555*** (.0615)
carown	2662*** (.0574)	1.3049*** (.0749)	.2667*** (.0574)	1.3057*** (.0749)	roomden	.1442*** (.0277)	1.1551*** (.0320)	.1463*** (.0278)	1.1575*** (.0322)
prchild	.0783 (.0918)	1.0814 (.0993)	.07976 (.0919)	1.0830 (.0995)	ltenure	-.0085*** (.0031)	.9914*** (.0031)	-.0084*** (.0031)	.9915*** (.0031)
children	.0415 (.0382)	1.0424 (.0398)	.0412 (.0382)	1.0421 (.0398)	centralcity	-.2852*** (.0579)	.7518*** (.0435)	-.2855*** (.0579)	.7516*** (.0435)
femalehead	1485*** (.0522)	1.1601*** (.0606)	.1523*** (.0523)	1.1646*** (.0609)	urban	.2472*** (.0708)	1.2805*** (.0906)	.2407*** (.0709)	1.2722*** (.0903)
widowed	-.2064*** (.0714)	.8134*** (.0581)	-.1989*** (.0716)	.8195*** (.0586)	own	.4123*** (.0798)	1.5103*** (.1205)	.4111*** (.0799)	1.5085*** (.1205)
nevmar	-.2787*** (.0711)	.7566*** (.0538)	-.2686*** (.0715)	.7644*** (.0546)	intercept	2.1000*** (.1536)		2.079*** (.1542)	
neighsatis~d	-.1574*** (.0541)	.8543*** (.0462)	-.1559*** (.0541)	.8555*** (.0463)	N	37341		37341	
neighsatis~w	-.6980*** (.1090)	.4975*** (.0542)	-.6952*** (.1090)	.4989*** (.0544)	Wald chi ²	1536.71		1541.76	
aban	-.5768*** (.0743)	.5616*** (.0417)	-.5716*** (.0745)	.5646*** (.0420)	Pseudo R ²	0.0999		10.0	

The figures inside the parentheses are robust standard errors.

*** denotes significant at 1%, ** denotes significant at 5%, * denotes significant at 10%.

Table 5: Logit Regression Results of Home Quality: Immigrant Only Sample

Variables	coefficient	Odds Ratio	Variables	Coefficient	Odds Ratio
blacknonhisp	.2064 (.2555)	1.2297 (.3142)	H10old	.9445** (.4169)	2.5716*** (1.0721)
hispanic	.1013 (.1762)	1.1066 (.1950)	sfat	.0024 (.3178)	1.0024 (.3185)
othernonhisp	.1729 (.1879)	1.1887 (.2234)	mf20	-.8455*** (.2007)	.4293*** (.0861)
somecol	.1103 (.1424)	1.1166 (.1591)	mf21	-.6937*** (.2436)	.4997** (.1217)
college	-.0293 (.1950)	.9710 (.1894)	mh	-.8458** (.3313)	.4292* (.1422)
hhldinc	.0036** (.0018)	1.0036** (.0018)	roomden	.2212** (.0870)	1.2476*** (.1085)
carown	.3995*** (.1260)	1.4912*** (.1879)	ltenure	-.0100** (.0101)	.9899 (.0100)
prchild	.1111 (.1947)	1.1175 (.2175)	centralcity	-.3136** (.1256)	.7307** (.0917)
children	.1063851 (.0738)	1.1122 (.0821)	urban	-.0701 (.2780)	.9322 (.2591)
femalehead	.2955** (.1246)	1.3438** (.16746)	own	.4802*** (.1826)	1.6165*** (.2952)
widowed	.1040 (.1715)	1.1096 (.1903)	naturalized	.2651* (.1513)	1.3036* (.1972)
nevmar	-.0633 (.1526)	.9385 (.1432)	timeus	-.0131** (.0064)	.9869** (.0063)
neighsatis~d	-.0065 (.1273)	.9934 (.1265)	intercept	2.0851*** (.4650)	
neighsatis~w	-.8019*** (.2514)	.4484** (.1127)	N	5732	
aban	-.5546*** (.1956)	.5742** (.1123)	Wald chi ²	311.27	
H0old	.2992 (1.0251)	1.3488(1.3828)	Pseudo R ²	0.1118	
H5old	1.4958*** (.5805)	4.4629*** (2.5909)			

The figures inside the parentheses are robust standard errors.

*** denotes significant at 1%, ** denotes significant at 5%,

* denotes significant at 10%.

Table 6: Logit Regression for Home Quality: For First time Homeowners

Variables	Coefficeint	Odds Ratio	Immigrant Only Sample		Variables	Coefficient	Odds Ratio	Immigrant Only Sample	
			Coefficeint	Odds Ratio				Coefficient	Odds Ratio
blacknonhisp	-.6911*** (.1289)	.5010*** (.0645)	-1.1876** (.5435)	.3049** (.1657)	sfat	.1286 (.2169)	1.1373 (.2466)	-.6782 (.5217)	.5075 (.2648)
hispanic	-.1672 (.1531)	.8460 (.1295)	-.6135* (.3831)	.5414* (.2074)	mf20	-1.2928*** (.1722)	.2744*** (.0472)	-1.4284*** (.3678)	.2396*** (.088)
othernonhisp	.1974 (.2524)	1.2183 (.3075)	.3527 (.4724)	1.4229 (.6722)	mf21	-1.5147*** (.2731)	.2198*** (.0600)	-2.4573*** (.5313)	.0856*** (.0455)
somecol	.3214** (.1390)	1.3790** (.1917)	.0780 (.3166)	1.0812 (.3423)	mh	-.7207*** (.1658)	.4863*** (.0806)	-1.5006*** (.4736)	.2229 *** (.1056)
college	.5731*** (.1828)	1.7738*** (.3242)	.1860 (.4493)	1.2044 (.5412)	roomden	.1242** (.0519)	1.1322** (.0588)	.2254 (.2142)	1.2529 (.2684)
hhldinc	.00007*** (.00001)	1.0000*** (.00001)	.0052* (.0028)	1.0052* (.0028)	centralcity	-.3081** (.1225)	.7348** (.0900)	-.3214 (.2787)	.7251 (.2020)
carown	.1363 (.1277)	1.1461 (.1464)	-1.1672** (.5436)	.3112** (.1691)	urban	.5209*** (.1289)	1.6836*** (.2170)	-.6820 (.7353)	.5055 (.3717)
prchild	.1158 (.1879)	1.1228 (.2110)	-.3327 (.4630)	.7169 (.3320)	naturalized			.0510 (.3569)	1.0523 (.3756)
children	.0323 (.0786)	1.0328 (.0812)	.2512 (.2042)	1.2856 (.2625)	before80	.0748 (.1794)	.9278 (.1665)	-1.1969** (.5014)	.3021** (.1514)
femalehead	.1568 (.1053)	1.1698 (.1231)	.3182 (.2945)	1.3747 (.4049)	nineties	.2076 (.1387)	1.2307* (.1707)	.6872*** (.3983)	1.9883*** (.7920)
widowed	-.2730** (.1390)	.7610** (.1057)	.1264 (.4090)	1.1348 (.4641)	twothousands	.1935 (.1335)	1.2135 (.1620)	1.2535*** (.4420)	3.5027*** (1.5482)
nevmar	-.2595* (.1491)	.7714* (.1150)	-.0433 (.4565)	.9576 (.4371)	intercept	1.9585*** (.2847)		4.1031*** (1.1506)	
neighsatis~d	-.0905 (.1102)	.9134 (.1007)	.3747 (.2905)	1.4546 (.4226)	N	11038		1727	1727
neighsatis~w	-.4386* (.2616)	.6448* (.1687)	-.6216 (.6663)	.5370 (.3578)	Wald chi ²	319.27		111.79	111.79
aban	-.7239*** (.1435)	.4848*** (.0696)	-.9108** (.4383)	.4021** (.1762)	Pseudo R ²	0.0838		0.1764	0.1764
timeus			-.0016 (.0160)	.9983 (.0160)					

The figures inside the parentheses are robust standard errors.

*** denotes significant at 1%, ** denotes significant at 5%, * denotes significant at 10%.