University of North Carolina Asheville
Journal of Undergraduate Research
Asheville, North Carolina
May 2021

The Effects of the 2008 Financial Crisis on Immigrant Cohorts Looking into Housing Ownership and Dwelling Characteristics

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Abstract

The 2008 Financial Crisis changed how we look at real estate and home ownership. It is well established that the deregulation of the financial sector by policies that eased the necessary lending standards to get a mortgage led to the crisis. This paper studies the impacts of the 2008 Financial Crisis on the home ownership of immigrants in the US. Using data from the Current Population Survey from 2002 - 2016, this paper examines both the quantity impact (overall home ownership) and the quality impact (various dwelling characteristics). Furthermore, the paper explores the heterogeneous effects of the 2008 Crisis across different immigrant cohorts and finds that older immigrant cohorts are the least vulnerable group and are 7.38% more likely than natives to own a home. They are also more likely to own a single-housing unit and rarely live in an apartment or a mobile home compared to other groups.

1. Introduction:

Having a stable economic well-being is fundamental in establishing a healthy and sustainable quality of life. Home Ownership is a major driving factor in demonstrating economic well-being. Owning a house has many advantages such as building equity, federal tax benefits, stable monthly payments, stability, and a great long-term investment. Previous research has been done on the effects the recession had on minorities home ownership, but none on immigrant cohorts or the last effects on any group over a span longer than five years. This paper studies the long run impact of the 2008 Financial Crash on housing quantity and quality and examines the heterogenous impact across different immigrant cohorts. The extended period of time will show the difference in wealth accumulation between groups. Immigrants have to deal with other challenges that the average American doesn't face such as difficulty speaking English, finding work, trouble taking off work, financial literacy, and limited transportation options. Immigrants historically are a major target for subprime lending and usually don't have as much savings in case of an emergency such as a job loss or health crisis.

Another key element of intrigue of my research is looking at the quality of living impact (dwelling characteristics) that the 2008 Financial Crash has on immigrant groups relative to natives, specifically looking into the increase or decrease in single family, apartment, and mobile homes percentages. The importance of quality of housing can't be underestimated. Owning a house or property versus an apartment or a mobile home has significant long-term impacts on its occupants. The remainder of this paper is organized as follows. The next section provides the literature review on the direct correlation between 2008 and home ownership and asset depreciation amongst the hardest hit groups. Section Three presents the descriptive statistics of my CPS sample and describes the CPS sample. Section Four presents the underlying empirical model and strategy of my regression analysis. Section Five presents and discusses the empirical findings, and Section Six concludes the results.

2. Literature Review:

There has been a substantial amount of research done on the impacts the 2008 Financial Crash had on minorities' economic well-being but, very little on the well-being of recently immigrated Americans within the last 50 years. The literature below looks at the direct correlation between the last recession and asset ownership and depreciation amongst the hardest hit groups.

A recession lessens the economic well-being of all, especially those with the most liquid assets and susceptible to the effects. Pilkauskas (2018) looks into the link between the unemployment rate and home/car ownership among lower-income families with children. He empirically assesses this by inferring a correlation between unemployment rate and car or home ownership. They found that a 1% increase in the unemployment rate was associated with a .6% lower home ownership, it accurately showed that the unemployment rate is negatively associated with home and car ownership. This is then spread out to account for the unemployment increasing by 5% to 10% to show the severity of the Financial Crash's impact on home and car ownership. This paper differs from Pilkauskas (2018) through the time frame (5 years vs. 14 years) and the groups of people being analyzed (minorities vs. immigrants). It also adds to the literature of looking at what specifically leads to housing ownership and explains the variance in it across groups.

Pilkauskas (2018) analyzes publicly available data from the Fragile Families and Child Wellbeing Study (FFCWS). Pilkauskas (2018) argues that real assets like homes and cars which are key into assessing economic well-being. The theory behind the importance of real assets is that it leads to wealth accumulation among low-income households following two key patterns: low-income households accumulate very little in liquid assets and, when they are able to start acquiring them, they lean toward the form of real assets like houses and homes.

Building on Pilkauskas analysis about real assets, Hendy, etc. (2012) infer that assets help families with financial crises such as job loss or an unexpected medical or cap repair bill. Asset building is crucial in achieving financial stability, and because the recession affected home prices/equity decreasing them substantially, this led to a decrease in wealth accumulation for most families. The Hendey, etc. (2012) paper adds to the existing literature by looking at the relationship of families living in low-income neighborhoods. These families in historically poorer neighborhoods are more affected by the recession because of target subprime lending, less access to traditional credit sources, and higher unemployment rates. This paper differs to the literature from Hendy, etc. (2012) because instead of looking at family size, its looking into the immigrant groups as individuals and is not location specific.

Hendy, etc. (2012) used unique longitudinal Making Connections cross-site survey data on assets and debts of 2,500 families living in low-income neighborhoods across the USA. Their estimation results show that perceptions of the neighborhood and access to credit from traditional sources, matter. Also, that low incomes families having emergency savings were crucial and those families with emergency savings are less likely to experience asset loss. Garriga and Ricketts (2017) also suggest that access to credit is important highlighting interest rates and loan structure are important. This paper differs from Garriga and Ricketts (2017) because instead of looking at the location of its families, these results are not location specific but, rather everywhere.

As noted above, there is plenty of evidence that during a recession the wealth losses are more pronounced for minorities than White college educated families. Garriga and Ricketts (2017) researches the effects of being a minority college educated vs. minority non- educated and how that affects homeownership rates. They look mostly into the homeownership experience for families who purchase homes between 2004 and 2008 using census data.

Table 1

Homeownership Rates by Race and Ethnicity

	Percent				
Race	1994	2006	2015	Change (1994-2006)	Change (2006-15)
Non-Hispanic White	70.0	75.9	71.9	5.9	–3.9
Black	42.3	47.8	42.3	5.5	–5.5
Hispanic, of any race	41.2	49.7	45.6	8.5	–4.1
Asian and other	47.7	59.9	53.8	12.2	–6.1

SOURCE: U.S. Census Bureau.

Figure 1: used in Garriga and Ricketts Paper. (2017)

Figure 1 was used in the Garriga and Ricketts (2017) paper and shows the changes in homeownership rates by ethnicity. This table illustrates how white household ownership lost the least percentage of household ownership. While Asians/other ethnicities and Hispanic house ownership rose the most between 1994-2006. Asians, with blacks being second, had the most significant housing ownership change. Garriga and Ricketts (2017) believe the reason behind this that Black and Hispanic borrowers experienced substantial repayment difficulties that led to a greater share of homes in foreclosure. Hispanics with the highest incomes in particular, fared worse than those with the lowest incomes. The regression analysis used by them suggests that underwriting standards and loan structures contributed to a greater likelihood of foreclosure among Black and Hispanic borrowers.

The results of the regression analysis by Garriga and Ricketts (2017) shows that Blacks and Hispanics have a 70% and 137% greater chance of foreclosure than whites. These results suggest that underwriting and the loan structure plan a big role in the chances of foreclosure during a recession.

3. Data & Descriptive Statistics:

The data used in this paper is from the 5% IPUMS census sample from 2002 to 2016. IPUMS CPS gets its data from the monthly U.S labor force survey, which is called the Current Population Survey or CPS, covering the period 1962 to the present. (IPUMS) This data is time-series data in which all of it is collected on specific time intervals and can lead to time-period bias. The 5% sample is used make sure that there is statistical significance when splitting the immigrant groups into sections. The dataset includes only those who are natives and immigrants between the ages of 18 to 65. The dataset mainly focuses those within the labor force and not those who usually do not have employment. This helps the final results because those who work want to own property or improve their living standards later on in life.

For both of my regressions the immigrant groups are broken into three cohort's immigrant groups, 1970s, 1980s, and 1990s. There are however limitations with this data involving my research, such as political and social occurrences that cannot be added to this data set. It is very difficult to quantify government policies that have been passed during the last two decades that have had a direct impact on housing ownership and its dwelling characteristics. Also, in some areas of the country owning a house or mobile home will always stay constant regardless of the economic disparity that is present.

House Ownership for this sample size averaged 28% from 2002 to 2006, then dropped 3% from 2007 to 2010, then went back up again to 30% from 2011 to 2016, with a standard deviation of around 45%. This is different from the Garriga and Ricketts (2017) because of the way housing ownership is defined. Housing Ownership is defined by outright ownership (not having a mortgage) in the IPUMS CPS sample. The Year of Immigration variable will be used to determine if it had a direct effect on House Ownership. The three decades of immigration that are being analyzed are the 1970s, 1980s, and 1990s. The number of people immigrating in the 1970s was 28,565, 48, 804 in the 80s, and 68,801 in the 90s. Natives are defined on those who have immigrated or whose family immigrated from the maximum of 1969 and downward.

Table 1: Immigrants and Natives Demographics thru 2002 - 2016

	Age (Years)	High School Completed %	Unemployed %	Married	Single	White	Other
Overall	36.71	86.75%	3.4%	41%	39%	79%	21%
Natives	40.26	87%	2.24%	55%	28%	63%	37%
1970s	54.19	86.87%	2.93%	66%	11%	62%	38%
1980s	47.11	85.67%	3.16%	64%	18%	63%	37%
1990s	39.34	84.75%	2.90%	56%	29%	67%	33%

This table shows the demographic differences between the immigrants and natives. The unemployment rate across natives and the immigrants remained steady and mirrored each throughout the years. Marriage seems way more important for the immigrants in the 1970s and 1980s each group because they are older than the average native and the 1990 immigrants. As we get older, a higher percentage of the population gets married. The diversity of the immigrants of all the groups and natives are almost identical. In column eight, "Other" stands for the other races of the sample size, that are not white.

Table 2: Comparison of Housing Ownership of Immigrant Cohorts and Natives

House Ownership	2002-2006	2007-2010	2011-2016
Overall	28%	25%	30%
Natives	20.33%	19.41%	24.39%
1970s	34.00%	32.69%	37.45%
1980s	32.00%	29.48%	33.6%
1990s	25.73%	25.30%	29.6%

House Ownership (defined above) is the outright ownership of whatever dwelling or property you have. As you can see the Financial Crash led to decrease in house ownership across all decades with the time periods of 2002-2006 to 2007-2010. The Immigrant cohorts have higher housing ownership rate than natives. Within each cohort of immigrant, you can see that house ownership goes down. The gap between 1970s and the 1990s and natives is quite shocking but that can mostly be attributed to the advancement in age because the average age of those immigrants in the 1970s are around fifty-four years old.

Table 3: Comparison of Total Family Income Amongst Immigrant Groups and Natives

Total Family Income	2002-2006	2007-2010	2011-2016
Overall	$71,105	$73,229	$78,135
Natives	$66,823	$68,775	$70,293
1970s	$67,992	$76,544	$81,927
1980s	$64,174	$68,768	$75,440
1990s	$59,921	$62,262	$69,818

Table 3 shows that the total Family Income only rose $7,030 between 2002 to 2016, taking into account for inflation the average family is making less in 2016 than they were in 2002. 1970s Immigrants are the highest earning group because they are in the later stages of their careers and moved to the USA usually for a stable job. The immigrant cohorts make less money that the natives on average between 2002 thru 2006, while they have a higher average total family income after 2011 thru 2016 than the natives.

Table 4: Dwelling Characteristics Table Averaged from 2002 to 2016

	Natives	1970s	1980s	1990s
Mobile Home	2.18%	1.51%	1.94%	2.56%
One Unit/House	38.86%	53.03%	48.17%	43.59%
Apartment/ Townhouse	58.96%	45.46%	49.92%	53.85%

Table 4 shows that the quality of living were natives were more likely to live in an apartment (58.96%) than the immigrant cohorts. The immigrant cohorts were also more likely to live in a one unit which is a house on average of 48.26% than the natives at 38.86%. The mobile home quality was very similar across all of the immigrant cohorts and natives.

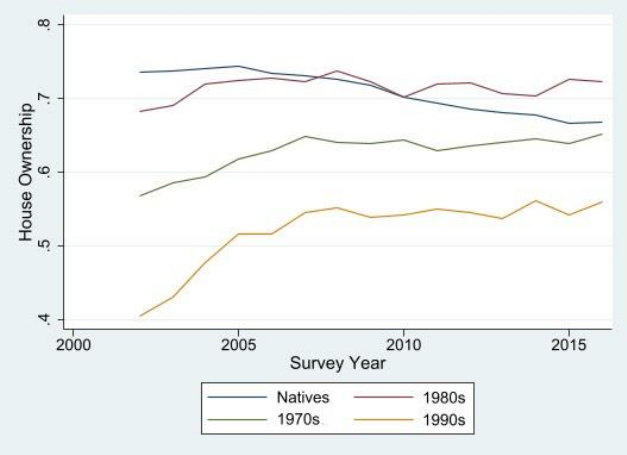

Figure 2: Housing Ownership Change from 2002 to 2016.

In this graph (Figure 2) the survey year is on the x-axis, with the mean Housing Ownership on the y-axis. The mean housing ownership is broken into four separate groups, the natives and the three immigrant cohorts. Also, the mean housing ownership is different from outright housing ownership, which explains the differences in the Table 2. The mean housing ownership takes into account for the mortgage from the bank. The natives start at the highest percentage, then the 1970s immigrant group catches up around 2008, and then is above the natives for the remainder of the years surveyed. The natives are in a decreasing slope, while the 1980s immigrant group almost catches up with the natives at the end.

4. Empirical Methods

Regression One shows the long-term impact that the 2008 Financial Crisis had on Immigrants in terms of Housing Ownership:

$$\text{House Ownership}_{it} = \beta_0 + \beta_1 \text{Crisis}_t + \beta_2 \text{Immigrant}_i + \beta_3 \text{Crisis}_t * \text{Immigrant}_i + X\gamma_{it} + \varepsilon_{it}$$

Immigrants for this paper are defined as those who immigrated to the United States between the 1970s to 1990s. This variable captures how immigrants house ownership changes relative to natives from Pre- and Post-Crisis. Crisis is

defined as those in the IPUMS CPS sample size that were surveyed after 2008. Crisis shows the effects that the 2008 Financial Crisis had on housing ownership as a whole. This expected to be negative because of the well-known fall damage the crisis had on the housing market. The interaction term (β_3) captures how immigrants are differentially impacted by the crisis. The constant house ownership rate is defined by (β_0). The control variables (X) which are race, marital status, and employment are put into to show a more accurate causal effect of the immigrant groups on housing ownership. These control variables were chosen because of the Pilkauskas (2018) paper that shows the correlation between employment and housing ownership, and also controls for marital status. Race was included as a control variable as well because in the Garriga and Ricketts (2017) paper showed the direct correlation between minorities and homeownership rate across 1994 to 2015.

Regression Two shows the long-term impact that the 2008 Financial Crisis on Immigrant Cohorts, in terms of Housing Ownership:

$$\text{House Ownership}_{it} = \beta_0 + \beta_1 \text{Crisis}_t + \beta_2 I_{70i} + \beta_3 I_{80i} + \beta_4 I_{90i} + \beta_5 I_{70}*\text{Crisis}_t + \beta_6 I_{80}*\text{Crisis}_t + \beta_7 I_{90}*\text{Crisis}_t + X\gamma_{it} + \varepsilon_{it}$$

This is an extension of the previous regression, with all previous control variables used. However, the Immigrants are defined as those who immigrated to the United States between the 1970s to 1990s. These immigrants are then split into three different cohorts corresponding to a specific decade to examine the heterogenous impact relative to one another and natives pre- and post-crisis. The interaction term ($\beta_5 - \beta_7$) shows the heterogenous impact across different immigrant cohorts relative to natives, after the 2008 Financial Crash. This term is important because you can what immigrant cohort faired the best and how that specific decades of immigrants is bouncing back.

Regression Three shows the long-term impact that the 2008 Financial Crisis on Immigrant Cohorts, in terms of Housing Quality:

$$\text{Dwelling Characteristics}_{it} = \beta_0 + \beta_1 \text{Crisis}_t + \beta_2 \text{Immigrant}_i + \beta_3 \text{Crisis}*\text{Immigrant}_t + X\gamma_{it} + \varepsilon_{it}$$

Like, the first regression shown, this focuses on the effects that the 2008 had on housing, this one more specifically looks into the effects that the 2008 had on housing quality. This defined by separating housing quality into three separate groups: single housing units, apartments, and mobile homes. Housing Quality is a big factor in contributing to quality of life. Living in House versus an apartment your whole life can have lasting effects on a person, mentally, physically, and financially. After 2008, we can expect that more people moved into apartments after losing their home, and more people moved out of single housing units. This would be mean that the Crisis(β_1) coefficient will be negative for the single unit housing and at the greatest magnitude compared to the apartment and mobile home results. The percentage of people living in mobile homes usually will not change if there is crisis because of the state of modern housing in the United States.

Regression Four shows the long-term impact that the 2008 Financial Crisis on Immigrant Cohorts, in terms of Housing Quality:

$$\text{Dwelling Characteristics}_c = \beta_0 + \beta_1 \text{Crisis}_t + \beta_2 I_{70i} + \beta_3 I_{80i} + \beta_4 I_{90i} + \beta_5 I_{70}*\text{Crisis}_t + \beta_6 I_{80}*\text{Crisis}_t + \beta_7 I_{90t}*\text{Crisis} + X\gamma_{it} + \varepsilon_{it}$$

Regression Four being similar to the second one compares, and contrasts defined immigrant cohorts relative to natives on their respected housing quality. The youngest immigrant group should have the most change in apartment living because of the wealth accumulation starting to occur. The oldest immigrant group usually will undergo the least amount of housing quality change because of preferences in living conditions already establish through their lifetime. Also, the post crisis interaction term ($\beta_{5\text{-}7}$) will show how each immigrant rebounded in terms of housing quality compared with one another.

Housing Ownership and the Quality of said Housing can be the function of many different variables. Some of the possible omitted variables that could influence the results that can't be found from IPUMS CPS sample are how

willing are banks to lend and the credit history of these immigrant groups. On the supply side, some of the omitted variable bias is the rising costs of construction and the availability of land that can't be factored in. The error variable at the end symbolizes the uncertainty within the model and accounts for some of the omitted variable bias.

5. Empirical Results

Figure 2 below shows the regression results of regression one and three. Columns 4 thru 6 the control variables are displayed as an X. Row 2 thru 4 provides values showing how each individual group was affected by the 2008 Financial Crash. Column 3 thru 5 shows how each group's housing quality or dwelling characteristic changed. Beneath each value, is the two-tailed P value which indicates that that these results are statistically significant.

	Housing Ownership	Apartment Living	Single-Home Living	Mobile Living
Post-Crisis Group	-0.3474 (0.000)	-0.0211 (0.000)	-0.3445 (0.000)	-0.0206 (0.000)
Immigrant Group	-0.1748 (0.000)	0.1062 (0.001)	-0.1744 (0.000)	-0.0111 (0.000)
Post-Crisis Immigrant Group	0.1764 (0.000)	-0.051 (0.000)	0.1779 (0.000)	0.0128 (0.000)
Employment Status	X	X	X	X
Marital Status	X	X	X	X
Race	X	X	X	X

Figure 2. Results of OLS Regression 1 and 3.

The results in (Figure 2) show that the crisis group which includes the immigrants and natives has the greatest negative value of -0.3474. This tells us that the crisis group were 34.74% less likely to own a home. It also shows us that the immigrant groups being looked at as a whole were -17.48% less likely to own a home. There is a difference is these statistics because we are looking at this immigrant group from 2002 to 2016, not just post-2008. This means that these immigrants fared better the crisis group. The interaction term of the post-crisis immigrant can be interpreted by adding the post-crisis group, the immigrant group, and post-crisis immigrant group together. By doing this calculation we could see if these immigrants actually performed better than the natives. The results of this calculation showed that the immigrant groups had a positive coefficient in terms of apartment living of 3.41%, with the natives at -2.11%. The immigrant groups performed very similarly to the natives in terms of likely to owning a and single home quality of living which was -34.74% vs. -34.58%. The immigrant group were likely than the natives in the mobile home dwelling characteristics by -1.98% vs. -2.06%.

Figure 3 below shows the regression results of regression two and four in quantity. In, row 2 thru 4, these are the changes in quantity and quality over the whole time period of 2002 thru 2016. In row 5, it is the results of everyone in the dataset, including the immigrant groups after 2008. In, row 6 thru 8 it is the changes in quantity and quality after 2008 for each immigrant group. Column 2 provides values showing the increase or decrease in Housing Ownership dependent on each group. Column 3 thru 5 shows the positive or negative movement in housing quality of each group, if it is a positive increase than that means that the specific living situation has increased.

	Housing Ownership	Apartment Living	Single-Housing Living	Mobile Home Living
1970s Immigrant Group	-0.0244 (0.000)	0.0678 (0.000)	-0.0550 (0.000)	-0.0171 (0.000)
1980s Immigrant Group	-0.1303 (0.000)	0.0891 (0.000)	-0.1413 (0.000)	-0.0117 (0.000)
1990s Immigrant Group	-0.2633 (0.000)	0.1326 (0.000)	-0.2432 (0.000)	-0.0008 (0.000)
Post-Crisis Group	-0.3472 (0.000)	-0.2122 (0.000)	-0.3445 (0.000)	-0.0206 (0.000)
Post-Crisis 1970s Immigrant Group	0.0984 (0.000)	-0.2948 (0.000)	0.1114 (0.000)	0.0141 (0.000)
Post-Crisis 1980s Immigrant Group	0.1502 (0.000)	-0.3652 (0.000)	0.1545 (0.000)	0.0117 (0.000)
Post-Crisis 1990s Immigrant Group	0.2236 (0.000)	-0.0695 (0.000)	0.2189 (0.000)	0.0132 (0.000)
Employment Status	X	X	X	X
Marital Status	X	X	X	X
Race	X	X	X	X

Figure 3. Results of OLS Regression 2 and 4.

The results in (Figure 3) show the differences across each immigrant group and natives in terms of housing ownership and quality pre- and post-crisis. The 1970 immigrant cohort were -2.24% less likely to own a home compared to natives. The 1990 immigrant cohort were the least likely group to own a home at -26.33%, this can be attributed to age and level of income. The post-crisis group like in (Figure 2) had a negative coefficient across the board. Like, in the above regression a separate calculation is done to interpret the post-crisis immigrant groups coefficient. The 1970 Immigrant cohort were the most resilient -27.4% less likely to own a house, compared to natives -34.72%. This shows that the older you are the more likely you are to own a home. The immigrant cohort of 1970 and 1980 were also -43.92% and -48.83% less likely to own an apartment, compared to natives -21.2%. This shows these immigrant cohorts prefer to live in an apartment less than natives. There are obvious reasons behind this being wealth accumulation and the constant positive returns in real estate. Immigrants in these groups usually have a higher level of education than natives which plays into the role of financial literacy. The 1990 Immigrant cohort outperformed all of the other groups in the mobile home dwelling characteristic. They were -0.82% likely to move to a mobile home, with the percent likelihood average amongst the other immigrant groups and natives of around 2%.

6. Conclusion

Through the use of the same OLS regression on the housing quantity and housing quality of immigrant groups split into three separate cohorts, compared against each other and the whole collective from the IPUMS CPS dataset. This paper demonstrates significant heterogenous effects across the immigrant groups previously defined in the empirical methods section. This is useful in determining on just how resilient immigrants are to natives during a recession and why the year you immigrate to a country matter. Additionally, the 1970 immigrant cohort were 7.38% more likely to own a home compared to natives pointing to greater skill gaps and available capital over the long-term, after the 2008

Financial Crash. Also, I was surprised that the apartment living coefficient amongst immigrant groups were so different. The major shortcoming of this paper is that their needs to be more variables that affect housing quantity and quality put in the above regressions, some of them could be quantified, but supply and demand side changes would be hard to account for a long period of time. Also, focusing on a specific city, singular geographic location, with these immigrant groups would be very interesting because you could see if the trends are valid for a specific location.

7. References

1. Garriga, Ricketts, and Schlagenhauf (2017), "The Homeownership Experience of Minorities During the Great Recession ", Federal Reserve Bank of St. Louis Review, First Quarter 2017, 99(1), pp. 139-67.

2. Hendey, Leah and McKernan, Signe-Mary and Woo, Beadsie, Weathering the Recession: The Financial Crisis and Family Wealth Changes in Low-Income Neighborhoods (March 1, 2012). The Urban Institute, March 2012

3. Team, MPC UX/UI. "U.S. CENSUS DATA FOR SOCIAL, ECONOMIC, AND HEALTH RESEARCH." *IPUMS USA*, usa.ipums.org/usa/index.shtml.

4. Duque V, Pilkauskas NV, Garfinkel I (2018) "Assets among low-income families in the Great Recession.", PLoS ONE 13(2): e0192370.