Immigrant Homeownership during the Great Recession and Beyond: Role of Birth Networks. *

Kusum Mundra† and Ruth Uwaifo Oyelere,‡

June 14th, 2014

*Please direct correspondence to kmundra@andromeda.rutgers.edu or ruth.uwaifo@econ.gatech.edu

†kmundra@andromeda.rutgers.edu, Department of Economics, Rutgers University, Newark and IZA, Bonn Germany

‡ruth.uwaifo@econ.gatech.edu, School of Economics, Georgia Institute of Technology, 221 Bobby Dodd way, Atlanta, GA 30318 and IZA, Bonn Germany

Immigrant Homeownership during the Great Recession and Beyond: Role of Birth Networks.

Abstract

The Great Recession had significant economic effects both in the U.S. and around the world. There is evidence that homeownership rates declined during this period, though immigrants were less severely affected compared to natives. In this paper we investigate the role of several factors in reducing the vulnerability of immigrants in the face of the economic crisis and increasing the probability of their homeownership. Specifically, we examine to what extent immigrants' birthplace networks, savings, length of stay in the U.S., and citizenship status affect the probability of homeownership before the recession and to what extent their impact on homeownership have changed since the recession. Using data for the years 2000 - 2012, our results suggest that birthplace networks have a significant effect on homeownership and this effect increases after the onset of the recession. Moreover, the impact of birthplace network on homeownership is stronger for citizens and those who are not recent immigrants. We also find heterogenous impacts in the impact of savings, length of stay and citizenship status when comparing the prerecession period to the post.

JEL classification: R20, R23, J11, J15,

Keywords: Birthplace Networks, Homeownership, Great Recession, Savings, Years in the U.S., Citizenship Status

1 Introduction

The Great Recession is acknowledged to be the most devastating global financial crisis of recent times and the effect of this recession will be felt for many decades to come. A common belief is that the housing market played a key role in triggering the Great Recession by a failure of the risky mortgage markets and subprime loans. The widespread relaxation of credit constraints and underwriting practices leading to excess leveraging of the homeowners during the housing boom led to excessive foreclosure and great loss of personal wealth (Ellen and Dastrup 2012). The Great Recession is believed to have left many people with vast losses in potential income, retirement income, and led to wealth gaps that could last for generations to come. Recent evidence like Ownens and Sampson (2013) suggest heterogeneity in the impact of the recession with greater negative effects in communities with higher concentrations of minority and immigrant residents.

There is clear evidence from the U.S. census data that homeownership rates declined during the Great Recession. However Mundra (2013) and Painter and Yu (2012) recent evidence suggests heterogeneity in that decline across groups. Painter and Yu (2012) find that the early impact of the recession across the U.S has been more severe on native-born than on immigrants. We also note a similar trend in our analysis using data from the Current Population Survey (CPS), though over a longer period of time (see Table 1). Specifically, while natives experienced a decline in homeownership from 74.27% between 2000-2006 to 72.42% (2007-2012) immigrants on average experienced an increase from 52.41% to 54.32%.[1] Given immigrants experienced greater negative wage decline since the recession than natives and yet on average seem to have experienced no decline in homeownership while natives have, it is important to focus on the factors that affect homeownership for immigrants and the changing role of these factors since the recession.[2]

Immigrants, just like natives, pursue homeownership because of its many advantages, ranging from tax relief to building wealth via home equity, which, in turn, allows for home equity loans

[1] National Bureau of Statistics (NBER) states that the Great Recession lasted for 18 months from December 2007 - June 2009. Our table break down into two period does not isolate this period but shows rates for before the recession and from the recession onward.

[2] Data trends noted from March CPS data 2007-2012

to finance education or business opportunities, as well as for cash reserve (Chandrasekhar, 2004). Yet, as noted in the literature on immigrant housing, a significant homeownership gap still remains between natives and immigrants (see, for instance, Coulson, 1999; Borjas, 2002; Painter et al.,2001; Diaz McConnell and Marcelli, 2007). Immigrant homeownership also leads to better integration of the immigrant groups in the U.S. neighborhoods and is crucial for immigrant assimilation (e.g. Blanton 1994; Rosenbaum and Friedman 2007). Immigrants have been substantial drivers of the housing demand in the U.S. (Simmons 2001) and a recent report predicts that even after the 2007 collapse and subsequent stagnation of the housing market, immigrants based on the demographic projections in the U.S. will continue to fuel the housing demand through 2020 (see Myers and Pitkin 2013). Hence focusing on homeownership among immigrant is very relevant and timely.

There are other reasons why we focus our analysis solely on immigrants. First, there is already are already well known income, wealth, housing cost, financial instrument differences among natives compared to immigrant groups in the U.S. Given these pre-existing differences and unique characteristics of immigrants, isolating impact in a general analysis of all individuals in the U.S. may be difficult given potential selection bias. This is especially true when issues related to networks, social capital, coping mechanisms and vulnerability are central issues being discussed.

In this paper, we particularly focus on the role of immigrants' birthplace networks, savings, years in the U.S., and U.S. citizenship on homeownership and how these factors could potentially cause the Great Recession to have heterogenous effect on homeownership. More generally these factors reduce individuals' vulnerability and increase their probability of homeownership based on theoretical foundations in the housing, network and social capital literature. We ask three specific questions. First, has the impact of savings, years in the U.S., and U.S. citizenship, on homeownership probabilities changed since the recession? Second, what is the role of birthplace networks on the probability of owning a home before the recession and has this impact changed over time? Third, to what extent does the impact of birthplace networks exhibit heterogeneity based on citizenship status, recent immigrant status and has the impact changed over time?[3]

[3]The immigrant groups referred to here are recent and non recent immigrants; citizens and noncitizens.

Using a larger representative sample of immigrants in the U.S. from the March Current Population Survey (CPS) derived from Integrated Public Use Micro-data Series (IPUMS) from 2000-2012, we examine the changing role of these factors overtime using a probability model. We address potential endogenous effects using several controls and fixed effects. Specifically, we estimate the marginal effects of each of these factors in reducing vulnerability and increasing immigrant homeownership. In addition, we divide our sample into two periods: the first period is before the Great Recession (2000-2006) (henceforth BGR period) and the second period focuses on the year the recession started and afterwards (2007-2012)(henceforth GRA period). We then estimate the change in the impact of these factors between the two periods using an interaction between recession and each variable. Finally to answer our third question we include in our model a triple interaction term capturing the recession, birthplace networks and each of the following factors: citizenship status, recent immigrants (less than 20 years in the U.S).

Our main findings suggest that birthplace networks are important for homeownership. In addition we find that birthplace networks are the only housing determinant for which we note a substantial change in its impact on homeownership during the recession and onwards- the effect doubled. This result suggest that individuals leveraged their network more during the recession to either keep their preexisting home or in purchasing homes post the crises. We also note that the effect of birthplace networks is not only heterogenous over time, but varies across citizenship status and years in the U.S. In particular we find that the effect of birthplace networks are stronger for citizens and significantly lower for recent immigrants. We however do not find any significant difference in the impact of birthplace networks for these factors between the two periods. In addition, we find a minimal decline in the role of length of stay and savings in predicting homeownership. The noted decline in the role of savings is robust to alternative ways of measuring savings as highlighted in our descriptive section.

This paper makes an important contribution to the immigrant housing literature by highlighting the role of birthplace networks on immigrant homeownership and potential wealth creation (Alba and Logan 1992; Krivo 1995). Moreover, this paper also highlights the changing role of these networks for immigrants from the Great Recession onwards. Finding an increase in the impact of birthplace networks provides suggestive evidence on the role of networks in times of stress and financial vulnerability. We also showcase the declining role of savings and length of stay as predictors of homeownership. The past literature has examined the Great Recession and its impact on homeownership and recent papers have examined the importance of savings during the recession. However, the changing importance of factors like individuals' network and immigrant status both of which are correlated with how well individuals cope during crises have not been examined extensively. Our paper fills this gap.

Our results have policy relevant implications given the effort of the U.S government to revitalize the housing market and increase homeownership rates again. Given the unique challenges immigrants face and the mechanisms they may employ to prevent homeownership loss and increase the chances of homeownership and given current research which suggests that substantial increases in demand for homeownership in the future will be driven by immigrants (Myers and Pitkin 2013); identifying factors that affect their housing outcomes and how such factors have changed over time is useful in designing programs to target this group.

The rest of our paper proceeds as follows. In section two we review the past relevant literature on housing, birth country networks and assimilation. Section three is a summary of the data sets we use in this paper. In section four, we provide descriptive analysis of the data. Our empirical model is in section five, and section six provides a detailed summary of our finding and robustness checks. We conclude in section seven.

2 Relevant Background and Literature Review

Loss of homeownership and housing wealth were not experienced homogenously across various groups in the U.S. Some reports using national data and popular press have shown that Black and Hispanic households had the highest decline in homeownership and housing equity (Ellen and Dastrup 2012, Kochar 2009, Mundra 2013). There is increasing evidence, both from news articles and academic research, that many home loans during the recent housing boom, particularly the subprime loans, were predatory in nature and were concentrated in minority and poor neighborhoods (Mayer and Pence 2008, Mayer et. al. 2009, Avery et al 2008, Renaurt 2004; Daglish 2009, Ho and Pennington-Cross 2006). Using Home Mortgage Disclosure Act of 1975 (HMDA) data for the year 2004 Bocian et al. (2008) find that African-American and Latino borrowers are more likely to receive a higher priced subprime home loan than white borrowers.[4] In summary, during the housing mortgage market leading to the Great Recession the characteristics of the borrowers in the subprime market varied; however, they were disproportionately minority, lower income, older, less educated, financially less sophisticated and less likely to search for the best interest rates when applying for a mortgage. As a result, they were unable to comprehend the complex subprime securitization market and loan instruments that accompanied the recent housing market (Lax et al. 2008; Courchane et al. 2004).

In the literature not much is known on how immigrants fared generally during the Great Recession and afterwards, or whether certain immigrants coped with the housing crises better than others. Two recent papers provide a window into how immigrants fared during the crises. Painter and Yu (2012) using the 2006 and 2009 American Community Survey (ACS) suggest that the effect of the recession on immigrants has not been as severe. They emphasise the role of location, noting that in destinations where immigrants are newest reductions in homeownership was minimal compared to areas where immigrants had settled for a longer time(immigrant gateways). In a recent paper using the 2009 American Housing Survey, Mundra (2013) shows that natives experienced higher homeownership gains than immigrants during the housing boom. However, she finds that the exit from homeownership is higher for immigrants than natives, though naturalized immigrants fared better during the housing bust than their non-naturalized counterparts.

The past literature also suggest that the path to homeownership is very different for various immigrant groups in the U.S. Mainly because of differences in their economic assimilation, legal status, geographic location, and wealth constraints (Coulson 1999, Borjas 2002, Painter et al. 2001, Diaz McConnell and Marcelli 2007, and Diaz McConnell and Akresh 2008, 2010). In a recent paper

[4] There is also evidence of interest rates varying across neighborhoods; using a nationally representative single-family mortgage sample; Nothaft and Perry (2002) find that borrowers in a low-and moderate income neighborhoods usually pay 2-4 basis points more for 30-year loans. Also, many new homeowners purchased their homes with adjustable rate mortgage that typically re-set to a higher interest rates after the initial 2-3 years (Bair 2007).

using data from the 2003 New Immigrant Survey McConnell and Akresh (2010) show that housing cost burden varies among the legal immigrants in the U.S. by the country as well as the region of origin. Different immigrant groups not only have different financial wealth but they also differ in their choices of financial instruments as well as their confidence in the financial markets (Osili and Paulson 2007, 2009; Ketkar and Dora 2011). Immigrants also substantially differ in wealth transfers from their home country. Yu (2006) showed that the precondition of economic assimilation and acculturation into the U.S. society did not hold for many young Taiwanese immigrants during the eighties and nineties; primarily because of wealth transfers from their home country facilitating down payment for their homes.

2.1 Determinants of Homeownership : in the Context of the Great Recession

The vast literature on homeownership in general and for immigrants in particular have identified some key determinants of immigrant homeownership in the U.S. and potential wealth creation. In this paper we focus solely on immigrant networks, savings, years in the U.S., and citizenship.

2.1.1 Immigrant Networks

An individual's networks is a part of their social capital and is important for both natives and immigrants. However, for natives these networks are more diluted and not as critical as immigrant networks. Moreover, immigrants rely on social networks, particularly on their compatriots for their economic as well as social assimilation in the U.S. The literature has established a robust and significant positive effect of immigrant networks on immigrants' labor market outcomes (Chiswick and Miller 1996; Munshi 2003; Amuedo-Dorantes and Mundra 2005 to name a few). Patel and Vella (2013), in a recent paper, further show that networks have a strong effect on immigrants' occupational choice and wages. Using U.S. census data they show that the occupational choices of new immigrants are driven by the occupation of their compatriots and immigrants who choose the popular occupation have a larger and positive earnings effect.

There is evidence that immigrant networks also serve the financial needs of an immigrant's community and have a significant positive effect on wealth creation and housing outcomes. Shanmuganathan at al. (2004) show that the main ethnic groups in the U.S. actively provide banking needs to individuals, families and small businesses. Li et al. (2002) show that the rapid increase in the immigrant population in the U.S. has led to a rise in the ethnically owned banks and that these banks are playing an important role in the local community development. In particular they show that the Chinese ethnic banks have played a significant role in altering the residential and commercial infrastructures in Los Angeles counties such as Chinatown and the San Gabriel Valley ethno-urban area. They also show that during 1992 - 1998 almost 71% of the housing loans approved by these banks were to Asian Americans and only 17% were to whites. Many immigrants, either due to less education and limited English language skills feel at ease and trust banking with their ethnic banks in the U.S.[5]

The recent literature on foreclosure and loss of homeownership have shown that disproportionately larger proportion of minorities and immigrant households who obtained loans during the peak subprime period have lost their homes (Allen 2009; Mundra 2013). Both Mundra(2013) and Kochar (2009) find that many immigrants, particularly Hispanic immigrants were more adversely effected compared to Hispanic natives. However, Mundra (2013) finds that naturalized Hispanic immigrants have a lower exit from homeownership than their non-naturalized counterparts and Painter and Yu (2012) using American Community Survey find that recent immigrants who settled in new immigrants centers were less adversely effected in their homeownership outcomes than the immigrants in the established gateway immigrant centers. In this paper, we propose that a possible explanation for this trend is immigrants' social capital through their birthplace networks and their usage of ethnic banks. This explanation suggests that the very reasons that prevent the financial and cultural assimilation of immigrants might also be their insurance in the face of an economic crisis. In this paper, we argue that immigrant networks may have helped immigrants in obtaining more

[5]The role of social capital in removing credit constraints and improving the chances of homeownership is not restricted only to the U.S. population. In a recent paper Yamamura (2011) shows that for Japan, after controlling for unobserved area-specific fixed effects and various individual characteristics, homeownership and length of residence are positively related to investment in social capital by individuals.

flexible home mortgage loans. Furthermore, these networks may have provided access to community resources which may have helped immigrants in maintaining homeownership and/or assisted in purchasing homes during and after the crises.

In this paper we measure birthplace network at the state level. Painter and Yu (2012) measure networks in two ways. First, by the percentage of immigrant who are not linguistically isolated and speak English well and second, by the percentage of immigrants in the metropolitan area that have been in the United States more than 10 years. Our paper differs from Painter and Yu's in four main ways. First, we focus on birthplace networks versus other definition of networks because immigrants can credibly leverage their compatriots during a crises. We measure birth networks at the state level because a measure of an immigrant's network based on the size of immigrants in a metro area may not be as effective in capturing who immigrant may be able to depend on during a crises period. Social group formation and membership at a birth country level can be at the state level. Also, measuring networks by the share of compatriots in the state helps in differentiating the pure network effect instead of the upward mobility of the immigrant group captured by number of years in the U.S.. Second, we focus on the heterogeneity in the impact of birthplace networks based on citizenship status which is not considered by Painter and Yu. Third, we control for the effect of savings while examining the effect of birthplace networks. Lastly, we focus on a longer period from 2000-2012 and are able to deal with potential heterogeneity across states and time using fixed effects and also cluster the standard errors at the state, birth country and time level.

2.1.2 Savings

There is an extensive literature that highlights the important role of wealth as a determinant of homeownership. In the U.S., financial constraints particularly the money for down payment over and above a regular income plays a crucial role in explaining low homeownership (Linneman and Wachter 1989, Di and Liu 2007). For immigrant populations in the U.S., wealth constraints are particularly more acute compared to natives given the immigrant-native income and wealth gap

(Bauer et al. 2011). In a recent study Bohn and Pearlman (2013) show that the incidence of banking is 13% higher among natives than immigrants in the U.S. In addition Osili and Paulson (2007) using 2001 Survey of Income Participation data show that the immigrant-native wealth gap is also driven by the lower participation of immigrants compared to natives in the mainstream financial markets. They find that 79% of native households have savings or checking account whereas only 68% of immigrant household have any sort of bank account. This disparity is further increased when the assets gets more riskier and forward looking. Specifically they find that 15% of immigrants have an IRA account compared to 30% of natives and 34% of natives own a stock whereas the figure is only 20% for immigrants. The wealth gap between natives and immigrants and low use of mainstream financial institutions by immigrants further makes the wealth constraint an important hurdle in immigrant homeownership.

Among immigrants in the U.S. there are wide differences in their bank use and economic assimilation. The unbanked status of immigrants in the U.S. are often found to be correlated with low education, family size, low income and wealth and low confidence in the financial institutions and various financial vehicles (Osili and Paulson 2006, Rhine et al. 2006, Paulson and Rhine 2008, Chatterjee 2009). Using the New Immigrant Survey, Osili and Paulson (2007) show that among the recently legalized immigrants a higher proportion of immigrants who have checking account and who own stock in the U.S. also own wealth abroad. The attitude towards financial institutions and the choice of financial instruments are often dependent on the quality of the institutions in the immigrants' home country (Osili and Paulson 2008).

Another potential buffer for immigrants during periods of crises is using income from their home country. This fund transfer often happens through the ethnic banks or through individual family transfers. Furthermore, during economic crises, some immigrants, unlike natives, may increase their disposable income by decreasing the remittances sent to their home country. This kind of reallocation of resources peculiar to immigrant could serve as a short term transitory income buffer in the face of economic crisis.

2.2 Assimilation

The longer the immigrants reside in the U.S. the more economically and financially assimilated they are and this may have an increased impact on their homeownership (Coulson 1999; Alba and Logan 1992; Krivo 1995). Not only upward income mobility but more years in the U.S. helps immigrants in their financial assimilation and gives them an opportunity to better understand the housing market in the U.S. The literature on economic assimilation and social integration of immigrants have also shown that residing in large immigrant neighborhoods may often slow an immigrant's human capital and English language skill accumulation (Chiswick and Miller 1996).

2.3 Citizenship

It is well known that immigrants legal status as well as citizenship helps in their homeownership (Coulson 1999, Clark 2003, Krivo and Kaufman 2004, Toussaint-Comeau and Rhine 2004, Dorantes and Mundra 2013). Immigrants with U.S. citizenship might have less difficulty securing good housing loans and potentially have higher homeownership due to a greater security and permanence in the U.S.

3 Conceptual Framework: The Role of Networks in Coping with the Recession

As highlighted above, the Great Recession had dramatic effects on individuals and families. However as with any shock, individuals and families cope using different mechanisms. During the recession there was a significant job loss for many families. Given these losses, many families were at risk of losing their homes. An important question is how they were able to survive this period. Using savings is one way individuals cope with shocks; but given low levels of savings on average in the U.S the extent to which individual's savings can be leveraged to reduce vulnerability and home ownership loss during the recession may be attenuated - more so for immigrants.

Leveraging your network is one possible way individuals especially immigrants could have coped with the crises. In a recent paper Alsenia and Giuliano (2013) show that strong family ties may slow down faster economic growth of the immigrant household but does provide relief at the time of stress. So even if networks may hinder economic assimilation, they might become crucial for immigrant households in the labor and housing market during a period of stress such as the Great Recession.

The concentration in an area of an immigrant's co-nationals can have a positive effect on homeownership or may adversely affect homeownership. For instance in the areas where there are more earlier established immigrants or if there are more Spanish speaking population, there is a possibility of more Spanish newspapers and more information flows on housing availability and better understanding of financial institutions. In such areas there are more ethnic banking that might potentially improve immigrants housing outcomes. On the other hand, there is a possibility of overcrowding and more competition for the existing housing stock within these environments potentially leading to lower homeownership if immigrants have strong preference for living within those enclaves.

Immigrants tend to live in enclaves and keep in touch with others from their home countries through social activities and associations - that often have a presence at the state level. Under financial stress, as experienced by many households in the recent financial meltdown and subprime crisis, immigrants could rely on their social networks for income and financial support. These networks can be both family ties and ties with their compatriots. We hypothesize that banking with the ethnic and community banks protected some immigrants from adverse mortgage vehicles or gave them some buffer and prevented foreclosure when the home values fell. So immigrant networks may help in sustaining immigrant homeownership.

The need to leverage immigrant networks when buying a home may also have become more important since the recession as lenders tightened lending restrictions like maximum loan-to-value ratios. During the housing boom individuals had the option to buy a home with minimal or no down payment. However since the recession, significant down payments are required for most loans.

Unfortunately for many families, saving the money for a down payment is the biggest obstacle to homeownership. Although, some government programs exist for homebuyers that can reduce this down payment to between 3 - 5% of the home value (low down payment mortgages), this is still a substantial amount for many individuals especially if the individual lives in cities or suburbs where average housing cost is high.[6] When a family's savings cannot cover this down payment, they usually seek help from family members or members of their network.

It is possible to assume that having a large immigrant birth network in an area increases the possibility of receiving assistance from this network during a crises. However, there are arguments that suggest otherwise. A large concentration of people from a particular birthplace in a location may not feel the need to form associations and clubs that bring the community together. Without such clubs and associations there may be minimal group cohesiveness among immigrants from the same birth country. Moreover social sanctioning of a member who does not provide help for others may not exist which may suggest that the group may be harder to depend on during periods of crises. In contrast, immigrants with a smaller population from their home country within an area may feel the need to form associations or clubs. These associations tend to build trust among members and social sanctioning of members who act against norms may be a credible threat within these groups. Trust fosters social capital accumulation which can make such networks more dependable for an immigrant especially during a period of crises.

Despite the possibility that larger networks can be less cohesive, we hypothesize that higher the percentage of immigrants residing from an immigrants home country in the state, the greater is the network that an individual can fall back on during a crises. This is because a larger network size increases the probability of a mutual insurance Meaning that an any time t when individual i have a negative shock, there would be some other individual j who this individual i can leverage upon - individual j is willing to help individual$i$.[7] Assuming that some form of mutual insurance

[6] Low down payment mortgages are those for which mortgage insurance is required which protects the mortgage lender. The mortgage insurance can be provided by private companies or the government. The Federal housing authority (FHA) insures many government loans. FHA's minimum effective down payment is less than 3 percent but there is a limit on the loan amount that varies according to geographic area.

[7] Of course a general state of economic depression like the Great Recession can reduce the effectiveness of such mutual insurance despite the existence of a large network.

is available via an immigrant's network, then the larger the network the greater the probability of homeownership at any given point in time. This will imply a greater possibility that there would be someone who would be available to assist in buying a home. We also hypothesize that the effect of these networks will increase during the recession as individuals faced with the prospect of losing their home garner help from those in their network. Hence during the recession in the U.S., we hypothesize that immigrants may have avoided home loss through the assistance of their network. Moreover, post the crises as the need for a down-payment became more critical in the home buying process, we hypothesize that immigrants will also leverage their networks more intensely.

Given trust is a factor that determines social capital and social capital within a network makes it possible for individuals to depend on their network during a crises period, it is reasonable to assume that immigrants who have stayed longer in the U.S. would have more social capital within the network and hence be able to leverage these networks more than recent immigrants. Moreover since naturalized immigrants have on average spend more time in the U.S. and given their permanence and less mobility, we assume they have more established networks and are able to leverage their networks more effectively. However, given these individuals are also relatively more established than non-citizens, they have more coping mechanisms than non-citizens who may depend almost entirely on their network for support during a crises. Hence the change in the impact of a network based on citizenship status or length of stay cannot be determined a priori and will be determined empirically in our paper.

4 Data Description

Our sample is derived from the CPS, which is a microdata set that provides detailed information about individuals and households. The CPS is a monthly U.S. household survey conducted jointly by the U.S. Census Bureau and the Bureau of Labor Statistics. We specifically make use of the March CPS which contains the Annual Demographic File and Income Supplement. We derive multi-stage stratified samples of the March CPS from Integrated Public use Microdata Series (IPUMS).

IPUMS-CPS is an integrated set of data from 51 years (1962-2012) of the March CPS. However we only make use of data from 2000-2012 for two main reasons. First there has been significant changes in the dataset and questions asked on the survey over time. Specifically our focus is partly on immigrants birthplace and not until very recently were more immigrant's birth places defined specifically in the CPS. [8] Second, our research is focused on comparing changes before and after the recession and hence restricting our period of analysis to a reasonable expanse of time before this event is useful in creating comparable periods that are likely to be free from time induced confounding factors. Given all monetary variables in IPUMS CPS are in nominal dollars and we make use of repeated crosssections over time, we adjust all monetary variables used in our analysis to constant 1999 dollars using CPI-U adjustment factor available in IPUMS (which corresponds to the 2000 CPS dollar amounts). Since the CPS makes use of a complex stratification sampling, we include personal weights for individual in our analysis.

4.1 Measuring Immigrant Networks

While immigrants associate with many networks, in this paper we are concerned with immigrant networks with those from their birth country. Our rationale for focusing on networks with conational is linked with the past literature that has documented the importance of these networks for immigrants.[9] We measure birthplace networks as the proportion of the state population from an individuals birth country in a state. Hence in our data, our birth network variable varies at the birth place level within a state in a particular year. As noted in a footnote above, for some individuals, the CPS does not list the birth country. These individuals can be classified into two categories, those who do not answer the question on birth country and those who are from countries with very few immigrants to the U.S and are classed in the CPS as "not specified (n.s)" birth places within each continent. For completeness and to avoid any potential selection bias, we construct our birthplace

[8] It is important to mention that in CPS some immigrants birthplaces are still not highlighted and such immigrants are classed together by continent. The non-mention of an immigrants birthplace is especially true for small countries in Africa, South America and Asia. However all countries with significant number of immigrants are listed separately in the CPS data from 2000-2012.

[9] See our review of the literature above.

network also including these individuals whose birth countries are not specified.[10]

We focus on birthplace networks at the state for two main reasons. First networks at the municipal level are likely endogenous while our measure of birthplace network is not likely to have similar endogeneity issues. We discuss this in detail later on in the paper. Second, given we are interested in those from a person's birth country who an individual can connect with and get help and support from especially via social groups and associations, it is unlikely that these individuals would be restricted to those who live in the same municipality as an individual. Rather individuals tend to be connected with conationals over a wider area like a city or state.

4.2 Measuring Savings

One of the variable whose effect on homeownership we are interested in is savings. We measure savings in four ways in this paper. Three of the ways we measure savings are constructed while interest income is found directly in the dataset. For most people, a significant portion of savings are accumulated through holding money in savings accounts and certificates of deposit (CDs). Interest income as defined in IPUMS CPS captures how much pre-tax income (if any) the respondent received from interest on saving accounts, certificates of deposit, money market funds, bonds, treasury notes, IRAs, and/or other investments which paid interest. We make use of this proxy for savings because actual savings levels are not available in the CPS. Most of the surveys available like the Survey of Consumer Finances that have information on savings do not contain a large enough sample of immigrants that can lend itself to the kind of analysis required for our questions of interest. However the use of interest income as a proxy for saving at a given point in time makes sense as interest income is a function of how much saving an individual has and hence a high degree of correlation exists between interest income and savings. We are not the first to use interest income as a proxy for savings in the literature. Farlie (1999) and Belton and Uwaifo Oyelere (2008) both use interest income and dividend income as proxies for savings. Although interest income is a good proxy for

[10]For these individuals if they are from Africa for example, they are assigned the share of immigrants in a state whose birth country is not specified in CPS but are from Africa. We do not worry too much about this measurement issue because individuals who fall into the 2 categories mentioned above are less than 5% of the entire sample. Moreover, our results are robust to our dropping these individuals from the analysis.

savings at a point in time, when comparing groups over time, using interest income to capture saving can lead to problematic inference. This is because a decline in interest income over time does not imply a decline in savings and could simply be because of a decline in the interest rate charged. Given the significant fall in interest rates and CD rates over the 2000-2012 period, more especially since 2007, we are concerned about potential inferences on changes in saving over time from trends in interest income.

The first graph in Figure 1 highlights the changes in mean yearly real interest income over our data period. Notice that interest income has a lot more variation over time than our constructed measures of savings and has declined from 2007 onwards. This decline in interest income does not imply a decline in savings. Specifically, there is evidence in the past literature that suggests that savings increased during the financial crises and onwards. Hence having measures that capture the noted trend in savings is useful.

As a way to deal with the limitations of interest income as a proxy for savings, we come up with an innovative way to recover approximate savings levels using the information on interest income. We recover savings in two main ways. First we obtain data on average annual rates for the 6 Month CD from 2000-2012.[11]. We then assume that the yearly interest income found in our CPS data for individuals is obtained solely from CD account. Using the information on the historic average annual rates during each year, we estimate the yearly size of savings that can lead to the interest income levels noted in the data for each individual.[12] The second way we recover savings is similar to the first. In this case we recover savings levels assuming interest income observed in our data is derived solely from basic savings accounts. We obtain yearly average bank savings rates from "Bankrate, Inc." online and as with CDs described above, we recover the level of savings that could yield the interest income levels noted in our data. Given most individuals' interest income is likely a combination of at least these two sources of interest income, we create our last proxy for savings as a weighted average of the savings level recovered assuming CD rates and the savings levels recovered assuming bank savings rates. While we know that these measures are rough estimates

[11] Data is obtained from forecastchart.com

[12] Compound interest is calculated across institutions in different ways: daily, monthly, quarterly or yearly. In recovering yearly savings level, we take the most straightforward approach assuming yearly compounding.

given individuals may have obtained their annual interest income levels via more than one or two channels, we are of the opinion that this recovered savings levels form a good proxy for actual savings levels.[13]

We illustrate trends in each of these recovered savings measures in the 3 later graphs of figure 1. Notice that unlike interest income (first graph) that declined from 2007 and onwards, our three measures of savings show increase in savings during this period which is more consistent with trends in savings rates from data from the U.S. bureau of economic analysis and the U.S federal reserve.[14] Moreover, beyond individuals having higher savings rates during this period, bank savings levels were further elevated as individuals moved money out of the stock market to much safer financial options like bank saving accounts and CDs. This could partly explain the elevated savings levels illustrated in figure 1 using our three recovered savings measures.[15]

4.3 Preliminary Descriptive Statistics

We present some summary statistics using tables and graphs that serve in part as a motivation for our research and the kind of questions we hope to answer in this paper. Table 2 summarizes some key variables in our study and gives the sample sizes, means and standard deviation across immigrants based on immigrants' birthplace continent. The seven main birth continent categories we divide into are as follows: those born in North America but not U.S. (henceforth NANU), those born in Central America and the Caribbeans(henceforth CAC) (this group also includes those born Mexico), those born in South America, Europe, Asia, Africa, those born in Australia and New Zealand which we refer to as Oceania.[16]

There are several observations from Table 2 that provide added motivation for why heterogenous

[13]It is important to mention that our recovered savings measures are in real terms using the base year of 1999. Given our data spans 13 years, all our monetary variables are converted to real terms using the CPI index. The base year is 1999.

[14]Data from the U.S. Bureau of Economic Analysis suggests that personal savings rates that were typically below 4% before the recession rose to over 8% in 2008 and by late 2012 was a little over 6%.

[15]Our savings measures are just estimates and could be somewhat inflated especially the estimate using bank interest rates. Recall that interest income data is from multiple sources as defined above and our measures are based on just the two common sources of interest income.

[16]The data also included respondents who do not indicate their country of birth hence we cannot assign them to continent groupings. We include these individuals in a category called others which we do not eliminate from our sample but do not report any results focused solely on this group.

impacts on homeownership across immigrants is likely. First we find that the share of immigrants from a birthplace who are naturalized is significantly higher for Europeans and Asians than immigrants from South America or Africa. Quite noticeable is the lowest share of naturalized immigrants from CAC which is driven primarily by the large illegal/undocumented immigrant population from Mexico in the last two decades. The presence of a strong network can serve to attenuate an immigrant's vulnerability especially during a period of crises like the recession. Table 2 suggests significant heterogeneity in network across immigrants based on birthplace continent. We control for birth place continent in our analysis.

Figure 2 highlights the change in the density distribution of the birth place network variable before the recession and since the recession. This figure suggests two things. First, there is a wide level of variation in the birthplace networks immigrants face. Second, the distribution of birthplace networks for immigrants has not changed significantly over the two time periods we consider which suggests no significant demographic shift among immigrants during this period. As a robustness check on the lack of change in distribution of networks across the two periods we consider, we also graph the density function of birthplace network for the two periods separately in the four states with the highest immigrant population (figure not included in paper) to see if the distribution of networks changed between the two period in each of these states but noted that while distributions differed across these four states, changes in the distribution over the two time periods we consider was minimal in each state just like the overall trend.

Age can increase the probability of homeownership and can play a role in reducing an individuals vulnerability to homeownership loss and so does the years in the U.S. Table 2 shows that on average immigrants from CAC, Africa and Oceania are younger than immigrants from elsewhere. Table 2 also highlights significant heterogeneity in the length of stay of immigrant across birthplace with immigrants from Europe and other countries in North America having on average length of stay in the U.S above 20 while immigrants from other regions have on average less than 20 years. We also find significant heterogeneity in savings across various immigrant groups with Europeans, NANU and Asians having higher savings than other regions.

Figure 3 shows mean homeownership by birth region for immigrants pre recession and onwards. These figure also suggest heterogeneity across groups in the changes in homeownership over time and also supports the need to control for birth place region in our analysis. Specifically, while there was a decline in homeownership for immigrants from Oceania and Africa we see no decline for immigrants from the other regions. This increase in homeownership for these immigrant groups during the 2007-2012 period is consistent with the patterns observed in Painter and Yu (2012) using 2009 data. The heterogeneity in homeownership rates over time is not only present across birthplace regions, differences across states in patterns over time also exists. Figure 4 captures these differences across four states that were on average more affected by the housing crises: Nevada, California, Arizona and Florida. The homeownership trends for immigrants across these four states differ. Immigrants experienced a decline in homeownership in all 4 states between 2007 and 2008 but the level of decline and trend in change since the recession differed across these states.[17]

Differences in savings pattern is one potential explanation for the heterogeneity in homeownership rates over time. Mody et al. (2012) have estimated that there was a sharp increase in precautionary savings around the globe during the great recession and we notice this trend in the average savings across all immigrant groups in Table 3. Table 3 captures mean savings by citizenship status and length of stay for both periods. The savings proxies used in this table are recovered savings assuming CD rates and interest income. The table highlights significant heterogeneity in changes in savings by citizenship status and length of stay and highlight the need to consider heterogeneity based on citizenship status and length of stay.

The need to control for certain variables when estimating differences across groups in homeownership probabilities is highlighted in figure 5-6. Figure 5 highlights the trends in homeownership by citizenship status and recent immigrant status over time. We define recent immigrant as one who at the time of the survey had spent less than 20 years in the U.S. Figure 5 suggests a higher decline in homeownership rates from the recession onward for non-citizens compared to citizens but similar decline for recent immigrants. We consider more carefully these kinds of differences in a regression

[17] The heterogeneity in trends across states is one reason why we include state fixed effects and cluster at the state, birth country and year in our estimation analysis summarized in Table 4-7.

setting later on in the paper. The role of networks during the recession and onwards is one we pay close attention to in this paper given its potential importance in attenuating homeownership vulnerability during crises periods. Figure 6 shows the average size of the birth networks size of birthplace network over the two periods across four states that have the highest size of immigrants: Texas, California, New York and Florida. This figure provides evidence of heterogeneity in network size across states pre recession and the period from the recession onward. Moreover the average size of the network in Florida and New York is less that 1% whereas the size in Texas and California is almost 8%. Of interest to us is to what extent these networks can affect the probability that an individual owns a home and to what extent this effect differs across citizenship status, recent immigrant status. In the next section we highlight our empirical strategy for estimating these effects.

5 Empirical Model

To examine the role of birth place networks, savings, years in the U.S. and citizenship on the probability of homeownership for immigrants before and from the Great Recession onward, we estimate the following probit model and derive the marginal effects for our variables of interest.

$$\Pr(O_{isj}=1)=\mathbf{X}'_{ik}\alpha+\beta_1 S_i+\beta_2 N_{isj}+\delta_{1,s}+\gamma_{1,br}+\psi_{1,t}+R_i(\mathbf{X}'_{ik}\sigma+\beta_3 S_i+\beta_4 N_{isj}+\delta_{1,s}+\gamma_{1,br}+\psi_{1,t})+\varepsilon_{isbr}$$

Where O_{isj} is the decision to own a home by the immigrant i living in state s from a country j. O_{isj} is a dummy variable and it takes the value of 1 if an individual owns a home and 0 otherwise.[18] Individual controls are included in the vector X and includes educational attainment, sex of the household, age, family size, years in the U.S., citizenship status. X also includes marital status and employment status as well as the log of the household real income and in some specifications we include total income. S_i captures our savings measure at the household level which we measure in four different ways as highlighted in our data description. Our network variable is N - share of the

[18] It is also important to note that the CPS data does not have information on whether this is an immigrants' first home or not. Hence, we are not able to distinguish between the effect of savings and networks on buying a first home or sustaining existing homes.

population from immigrant $i\prime s$ home country j in state s. A full set of birth country region effects (γ_{br}), year fixed effects (ψ_t) and state level effects (δ_s) are also included. We also include metro area dummies in our x. R_i is our treatment or recession dummy that takes the value 1 for the years 2007 - 2012. We estimate this probit model and given the difficulty in interpreting probit estimates directly, we calculate marginal effects.

The marginal effect estimate of β_2 captures the effect of an increase in birthplace network before the recession on the probability of homeownership and β_4 captures the change in the effect of networks on homeownership in the GRA period. Based on our conceptual framework, we expect $\beta_4 > 0$. Similarly β_3 captures the change in the effect of savings on homeownership in the GRA period and the change in the effect of citizenship status and the change in the effect of years in the U.S. post recession are captured within σ_k. In all our regressions we cluster our standard errors by birth place, state and year.

To examine the effect of how birthplace networks vary with citizenship and years in the U.S., and birth place regions we modify the model given by equation (1) by including further interactions. First, we include interactions between birthplace network and citizenship status, and a triple interaction between recession, birthplace network and citizenship status. Next, we include interactions between birthplace network and recent immigrant status, and a triple interaction between recession, birthplace network and recent immigrant status.[19].

Addressing Issues of Possible Endogeneity

It is worth noting that there is a possibility that there are some unobserved factors that are correlated with networks from country j in a state s as well as with the chance of homeownership by immigrant i from country j in state s. For instance, many immigrants from China might settle in California not only because of the past network effect but due to the higher overall chance of homeownership for an individual migrant in California. We minimize this potential source of endogeneity by including state fixed effects in our model. Hence effects are identified eliminating unobservable across states

[19] As mentioned earlier in the paper we identify recent immigrants if at the time of survey immigrant has been in the U.S less than twenty years.

that may be connected to network size and homeownership. Also to mitigate other potential bias in our main variables of interest, we include in our model extensive geographical controls. We include birth continent dummies, year fixed effects and controls for living in a metro area.

There is a possibility that second homeowners have higher networks since homeownership often leads to a better community building and possibly more networks. This could potentially lead to reverse causality from networks to homeownership. In CPS we cannot distinguish whether the immigrant is a previous homeowner or it is their first home. However, we worry less about this issue because our network variable is based on concentration of immigrants from an individual's birth country at the state level which is independent of an individual's second homeownership. Although, our inclusion of state fixed effects and other aforementioned controls likely eliminates potential bias in the estimate of the birthplace network variable, we cannot completely rule out the possibility of unobservables within a state correlated with homeownership and birthplace networks within that state. However, our main focus in this paper is not on deriving a consistent estimate of birthplace network but rather on obtaining a consistent estimate of the change in the impact of the factors we are interested in over the two time periods (BGR and GRA), which is possible as long as any residual potential bias in estimates is invariant between these two periods.[20]

Further, it is important to emphasize that focusing on the variation within state (not across state because of the state and time fixed effects) and measuring networks at the state-birthplace level and homeownership at the individual level reduces significantly the possibility that the networks are correlated with an omitted variable at the individual level that also predicts individuals' homeownership. Lets say that instead of measuring immigrant networks at the state level, we had measured these networks at the MSA or zipcode level, in this scenario, there is more of a concern that some factors are correlated with the local immigrant networks and demographics and also with the local homeownership at an individual level - one such example can be predatory lending. This would make the network variable endogenous to homeownership. This is primarily why we stay away from measuring networks at the local level and instead measure the share of the immigrants

[20]While we cannot think of any reason why this assumption should not hold, we cannot rule out the possibility of varying bias.

population from the immigrants birth country within a state.

6 Results

Table 4 gives the results from estimating a model of homeownership before we bring in our key savings and network variable. We find that household income, wages and total income all have a higher effect on homeownership during and after the recession. However, we find a slight decline in the role of years in the U.S in predicting homeownership over the two time periods. Although the effect increases after we account for income or wages. Similar to previous papers we find that immigrants' U.S. citizenship has a role to play in their homeownership. Immigrants who are naturalized citizen have a higher chance of homeownership than non-citizens. However, the effect of being a citizen on homeownership does not exhibit a change between the pre recession and the subsequent period. Older household head, being a female and higher educational attainment all increase the chances of homeownership in the U.S. Moreover, the effect of these variables do not differ during pre-recession and during 2007 - 2012 period. Interestingly we find a decline in the marginal effect of family size on homeownership during 2007 - 2012 compared to the pre recession period possibly due to additional family members moving in with other household members. For columns (3) - (5) we note that after controlling for the household income variables, the marginal effect of the family size falls by 1 percentage point in the GRA period.

In Table 5 we add our household savings measures. Columns (1) uses interest income as a control, column (2) makes use of recovered savings using CD. In column(3) we use the recovered saving measure from bank interest and column (4) uses the measure that captures the weighted average of the two measures. Table 5 suggests that savings increase the probability of homeownership but the change in the effect over the two periods we consider is negative. For example the effect of savings using savings recovered via CD showed a decline of 0.002 and using Bank interest rate showed a decline of 0.001. This results suggest that as expected, immigrants with higher savings still have a higher chance of homeownership. However the decline in the effect during 2007 - 2012 suggests that savings are used for more precautionary motives than home buying compared to previous years. All the other variables have similar effect as in Table 4.

Table 6 summarizes the results from our full model where we examine the effect of birthplace networks after controlling for household savings and other housing determinants. We find that birthplace networks have a significant positive effect on homeownership at 1 percent level of significance and this effect further increases significantly in the GRA period. This increased reliance on networks holds after controlling for savings measured in all ways. On an average there is a 25 percentage points increase in the marginal effect of an immigrants' home country network on their homeownership.[21] Including all the controls and the savings effect we find that networks are significant for immigrant probability of homeownership and they continue to play a critical role since the Great Recession began in 2007. The increased effect of birthplace networks during 2007 - 2012 shows that immigrants relied on their networks more during the crises period than before. Possibly to help in sustaining existing homes, preventing home loss or as an assistance in new home purchases.

Our finding birthplace networks affect homeownership and the impact has increased substantially in the GRA period is a new and significant result. To confirm the validity of this result, we conduct a further robustness check to see if our results are sensitive to year 2007 being included in our recession years. Our rationale for doing this is linked with the fact that the recession officially began in the last quarter of 2007. Hence technically speaking most of 2007 was prior to the recession. To test if our results are sensitive to where 2007 is placed we redo the econometric analysis above including observations from 2007 in the pre recession period and recreate our dummy for recession covering 2008-2012 versus 2007-2012 . These results provide estimates similar to those in Table 6. Our results are not sensitive to the inclusion of 2007 in the recession period as we do not find a statistically significant change in our variables of interest when observations from 2007 are moved to the BGR period.[22]

Table 7 summarizes the results that address our third question. In Table 7 we present the results focused on the question of heterogenous impacts of networks based on citizenship status and recent

[21] Even if the magnitude of the birthplace networks is large for immigrants, the average size of the networks is only 0.037 in our sample.

[22] These results are not included in the paper but are available on request from the authors.

immigrant status. The result for citizenship and network interaction is summarized in panel A while panel B has the results for the interaction between network and recent immigrant status. The results suggest that the impact of birthplace networks is stronger for immigrants who are citizens and for not so recent immigrants (arrived in the country before twenty years).[23] However, we do not find evidence of a change in these effect from the recession onwards. This implies that the difference in the effect of the birthplace networks across citizenship status and recent immigrant status does not change significantly over the two time periods. The finding of differences in the role of birthplace networks supports the view that immigrants who are citizens or have been in the U.S for a longer period might have stronger networks. In addition, they may have more information about financial institutions and the way the housing market works in the U.S. and are better able to leverage their networks for their homeownership outcomes.

7 Conclusion and Implications

In this paper we have considered three questions. First, has the impact of immigrants' savings, years in the U.S., and U.S. citizenship on homeownership probability changed from the recession onward? Second, what is the role of birthplace networks before the recession on the probability of owning a home and has that impact changed from 2007-2012 onwards? Finally, to what extent does the impact of birthplace networks exhibit heterogeneity based on citizenship status and being a recent immigrants and has the recession changed this impact differently across these groups? We find that while the impact of most factors that predict homeownership remain virtually the same over these time periods, the role of of savings and years in the U.S. appears to have decreased.

After accounting for savings and other housing determinants, we find that birthplace networks are important for homeownership and their importance in predicting homeownership has increased since 2007. We also find that the impact of birthplace networks on homeownership varys with citizenship status and recent immigrant status. However, we do not find this effect to vary over time.

[23] As a robustness check, we also estimated a model where we defined recent immigrants as 10 years or less (results not presented). Our inference that the impact of birthplace networks is stronger for non recent immigrants still holds

In conclusion, our results suggest that immigrants may not have experienced a significant decline in homeownership rates during the recession because they were able to leverage their networks with compatriots in the U.S. to increase their chances of homeownership or to sustain their current homeownership. This role of networks in assisting immigrants seems to be stronger for immigrants who spend more time in the U.S. and are citizens. Given that birthplace networks have a significant impact on homeownership and social networks are a part of social capital, then our results may also suggest that social capital makes a difference for immigrants in buying their first home or in sustaining homeownership during a crises and afterwards.

Given the importance of homeownership for immigrants' integration and wealth creation in new destination countries, examining the role of an important social determinant of immigrants' homeownership is crucial. This research will give insight on why immigrants are more successful in homeownership than other groups during the face of economic crisis and has wider implications beyond housing.

References

[1] Adsera A. and B. Chiswick 2007. Are there gender and country of origin differences in immigrant labor market outcomes across European destinations?. *Journal of Population Economics*, 20: 495-526.

[2] Alba, Richard D. and John R. Logan 1992. Assimilation and Stratification in the Homeownership Patetrns of Racial and Ethnic Groups. *International Migration Review*, 26(4): 1314-1341.

[3] Allen R. 2009. The Unraveling of the American Dream. Working paper, Humphrey Institute of Public Affairs, University of Minnesota.

[4] Alesina A. and P. Giuliano, 2013. Family Ties. NBER Working Papers 18966, National Bureau of Economic Research, Inc.

[5] Dorantes, C. A. and K. Mundra 2007. Social Networks and Their Impact on the Employment and Earnings of Mexican Immigrants. *Demography.*

[6] Dorantes, C. A. and K. Mundra 2013. Immigrant Homeownership and Immigration Status: Evidence from Spain. *Review of International Economics*.

[7] Avery R., Bevoort K., Canner G., 2008. The 2007 HMDA Data" Federal Reserve Bank Bulletin, December.

[8] Bair S. C. 2007. *The Case for Loan Modification*. Washington DC: Federal Deposit Insurance Corporation.

[9] Bauer, Thomas K., Cobb-Clark, Deborah A., Hildebrand, Vincent A. and Sinning, Mathias G. 2011. A Comparative Analysis of the Nativity Wealth Gap. *Economic Inquiry*, 49(4):989-1007.

[10] Bocian, D., Ernst, K., Li W., 2008. Race, Ethnicity and Subprime Home Loan Pricing. *Journal of Economics and Business*, 60, 110–124.

[11] Bohn S. and S. Pearlman 2013. Ethnic Concentration and Bank Use in Immigrant Communities. *Southern Economic Journal* 79(4): 864-885.

[12] Borjas, George J. 2002. Homeownership in the Immigrant Population. *Journal of Urban Economics*, 52: 448-476.

[13] Boyd, M. 1989. Family and Personal Networks in International Migration: Recent Developments and New Agendas. *International Migration Review*, 23(3).

[14] Belton, W., Uwaifo Oyelere, R, 2008. The Racial Saving Gap Enigma: Unraveling the Role of Institutions. IZA Discussion Papers 3545, Institute for the Study of Labor (IZA).

[15] Chatterjee, Swarn 2009. Do Immigrants Have Lower participation Rates in U.S. Finnacial Markets. International Journal of Business and Finance Research, 3(2):1-13.

[16] Chiswick, Barry R. and Miller, Paul W. 1996. Ethnic Networks and Language Proficiency Among Immigrants. *Journal of Population Economics*, 9(1), pp. 19-35.

[17] Clark, William A. V. 2003. *Immigrants and the American Dream: Remaking the Middle Class*. New York: Guilford Press.

[18] Coulson, N. Edward. 1999. Why Are Hispanic- and Asian-American Homeownership Rates So Low? Immigration and Other Factors. *Journal of Urban Economics*, 45: 209-227.

[19] Courchane, M., S., Zorn P., 2004. Subprime borrowers: mortgage transitions and outcomes, *Journal of Real Estate Finance and Economics*, 29, 365-392.

[20] Daglish, T. 2009. What motivates a subprime borrower to default?. *Journal of Banking and Finance* 33, 681-693.

[21] Di, Zhu Xiao, and Xiaodong Liu. 2007. The importance of wealth and income in the transition to homeownership. Cityscape 2007: 137-151.

[22] Diaz McConnell, Eileen and Enrico Marcelli. 2007. Buying into the American Dream? Mexican Immigrants, Legal Status, and Homeownership in Los Angeles Country. *Social Science Quarterly*, 88(1): 199-221.

[23] Diaz McConnell, Eileen and Ilana Redstone Akresh. 2008. Through the Front Door: The Housing Outcomes of New Lawful Immigrants. *International Migration Review*, 42(1): 134-162.

[24] Diaz McConnell, Eileen and Ilana Redstone Akresch. 2010. Housing Cost Burden and New Lawful Immigrants in the United States. *Population Research and Policy Review*, 29(2): 143-171.

[25] Donato, Katharine M. and Ebony M. Duncan. 2011. Migration, Social Networks, and Child Health in Mexican Families. *Journal of Marriage and the Family.*

[26] Donato, Katharine M., J. Trent Alexander, Donna R. Gabaccia, and Johanna Leinonen. 2011. "Variations in the Gender Composition of Immigrant Populations: How and Why They Matter. *International Migration Review.*

[27] Ellen, I. G. and S. Dastrup 2012. "Housing and the Great Recession. *Policy Brief*, Russel Sage Foundation and the Stanford Center on Poverty and Inequality.

[28] Farber, Henry S. 2012. "Unemployment in the Great Recession: Did the Housing Market Crisis Prevent the Unemployed from Moving to Take Jobs?, *American Economic Review- Papers and Proceedings.*

[29] Grusky D. B., B. Western, and Wimer C. 2011. *The Great Recession*, Russell Sage Foundation.

[30] Hilber, C. and Y. Liu 2008. Explaining the black-white homeownership gap: The role of own wealth, parental externalities and locational preferences. *Journal of Housing Economics*, 17: 152-174.

[31] Ho G., Pennington-Cross A., 2006. The impact of local predatory lending laws on the flow of subprime credit, *Journal of Urban Economics*, 60, 210-228.

[32] Ketkar, Suhas L and Dora, Manoj K. 2011. Wealth of Recent Immigrants to the USA, *International Journal of Economic Policy in Emerging Economics,* 4(4): 330-44.

[33] Kochar R., Ana G., Daniel D., 2009. Through boom and bust: minorities, immigrants and homewonership. Pew Hispanic Report.

[34] Krivo, Lauren J. Immigrant Characteristics and Hispanic-Anglo Housing Inequality. *Demography*, 32(4): 599-615.

[35] Krivo, Lauren J. and Robert L. Kaufman. 2004. Housing and Wealth Inequality: Racial-Ethnic Differences in Home Equity in the United States. *Demography.*

[36] Lax H., Michael L., Paul R., Peter Z., 2008. Subprime lending an investigation of economic efficiency, Housing Policy Debate, Fannie Mae Foundation.

[37] Li W., G. Dymski, Y Zhou, M. Chee, and C. Aldana 2002. Chinese-American Banking and Community Development in Los Angeles County. *Annals of the Association of American Geographers*, 92(4):777-796.

[38] Linneman, Peter D. and Wachter, Susan, 1989. The Impacts of Borrowing Constraints on Homeownership. *American Real Estate and Urban Economics Association.*

[39] Mayer C., Pence K., 2008. Subprime mortgages: What, Where and to Whom? NBER Working Paper, June 2008.

[40] Mayer C., Pence K., Sherlur S., 2009. The rise of mortgage defaults, *Journal of Economic perspectives*, 23(1), 27-50.

[41] Mantruk, K., Lindblad, M. and Q. Roberto 2010. Friends and Neighbors: Homeownership and Social Capital among Low- to Moderate-Income Families. *Journal of Urban Affairs,* 32(4), pp.471-88.

[42] Mayer, C. J. and Engelhardt, G. V. 1996. Gifts, Down Payments, and Housing Affordability. *Journal of Housing Research*, 7(1), pp. 59-77.

[43] Mody, A., F. Ohnsorge and D. Sandri. 2012. Precautionary Savings in the Great Recession. IMF Working Paper 12/42.

[44] Munshi, Kaivan 2003. Networks in the Modern Economy: Mexican Migrants in the U. S. Labor Market. *The Quarterly Journal of Economics*, 549-599.

[45] Mundra, K. 2013. "Minority and Immigrant Homeownership Experience: Evidence from the 2009 American Housing Survey," IZA Discussion Paper7131.

[46] Myers, D. and J. Pitkin 2013. *Immigrant Contributions to the Housing Demand in the United States: A Comparison of Recent Decades and Projections to 2020 for the States and Nation.* Research Institute for Housing America Special Report.

[47] Nothaft, F., Perry V., 2002. Do mortgage rates vary by neighborhood? implications for loan pricing and redlining, *Journal of Housing Economics*, 11:244-265.

[48] Osili, Una O. and Anna Paulson. 2007. Immigrants' Access to Financial Services and Asset Accumulation. in *Access, Assets, and Poverty*, ed. by Rebecca Blank and Michael Barr.

[49] Osili, Una O. and Anna Paulson. 2008. Symposium in Access to Finnace: What can we Learn about Financial Access from U.S. Immigrants Home Country Institutions and Immigrant Beliefs. *World Bank Economic Review*, 22(3):431-55.

[50] Osili, Una O. and Anna Paulson. 2009. Bank Crises and Investor Confidence. Working Paper CES 09-02.

[51] Owens, Ann and Sampson Robert. 2013 "Community Well-Being and the Great Recession" published in Recession Trends. Retrived on June 10th 2013 from http://www.stanford.edu/group/recessiontrends/cgi-bin/web/.

[52] Paulson Anna and Sherrie L. W. Rhine 2008. Financial Assimilation of an Immigrant Group: Evidence on the use of Checking and Savings Account. *Journal of Family and Economic Issues* 29: 264-78.

[53] Painter Gary and Zhou Yu. 2012. Caught in the Housing Bubble Immigrants' housing outcomes in traditional gateways and newly emerging destinations. Center for the study of immigrant integration Paper.

[54] Renaurt, E. 2004. An overview of the predatory mortgage lending process" *Housing Policy Debate*, Fannie Mae Foundation.

[55] Rhine, Sherrie L. W., William H. Greene, and Maude Toussaint-Comeau 2006. The Importance of Check-Cashing Business to the Unbanked: racial/Ethnic Differences. *Review of Economics and Statistics* 88: 146-157.

[56] Ruggles Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. Integrated Public Use Microdata Series: Version 5.0 [Machine-readable database]. Minneapolis: University of Minnesota, 2010.

[57] Shanmuganathan P., M. Stone, and B. Foss 2004. "Ethnic Banking in the USA," *Journal of Financial Services Marketing*, 8(4): 388-400.

[58] Simmons, P. 2001. Changes in minority homeownership during the 1990s, Fannie Mae Foundation Census, Note 07.

[59] Toussaint-Comeau, Maude and Sherrie L. W. Rhine. 2004. Tenure Choice with Location Selection: The Case of Hispanic Neighborhoods in Chicago. *Contemporary Economic Policy*, 22(1): 95-110.

[60] Yamamura, Eiji 2011. How Do Neighbors Influence Investment in Social Capital? Homeownership and Length of Residence. *International Advances in Economic Research*, 17(4), pp. 451-64 011

[61] Yu, Zhou 2006. A Different Path to Homeownership: The Case of taiwaneses Immigrants in Los Angeles. *Housing Studies*, 21(4): 555-579

Figures

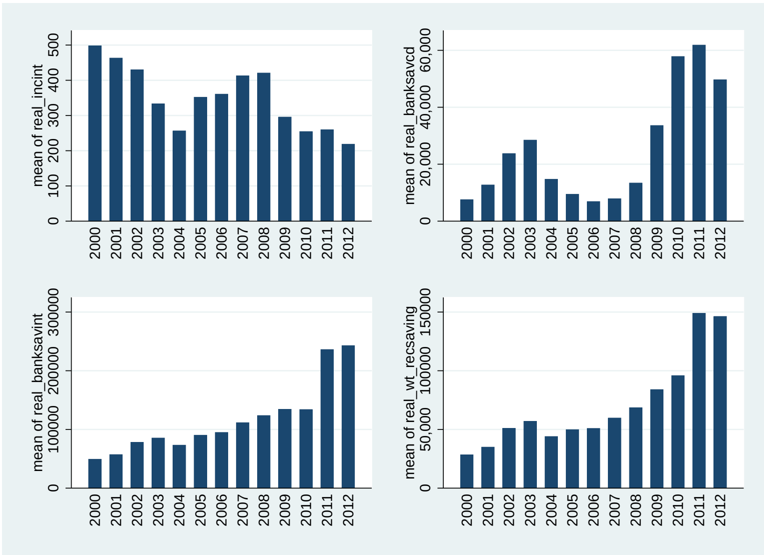

Figure 1: Changes in Savings Measures over time

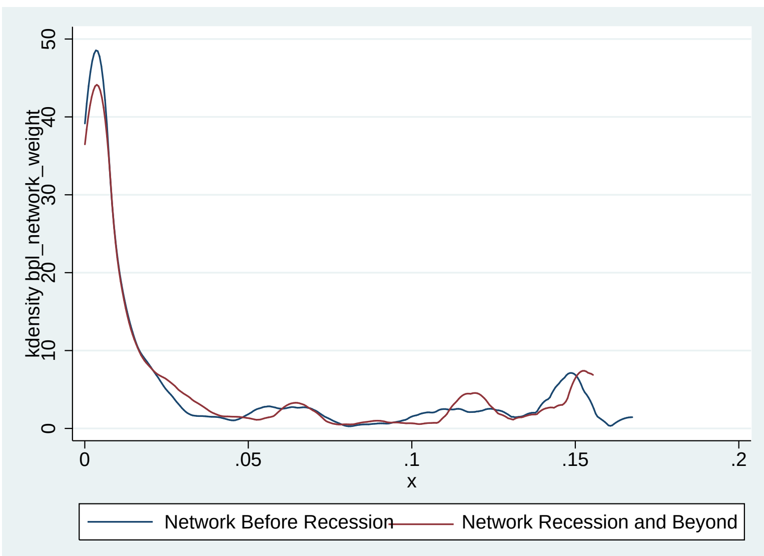

Figure 2: Birth place network before the Recession and Beyond

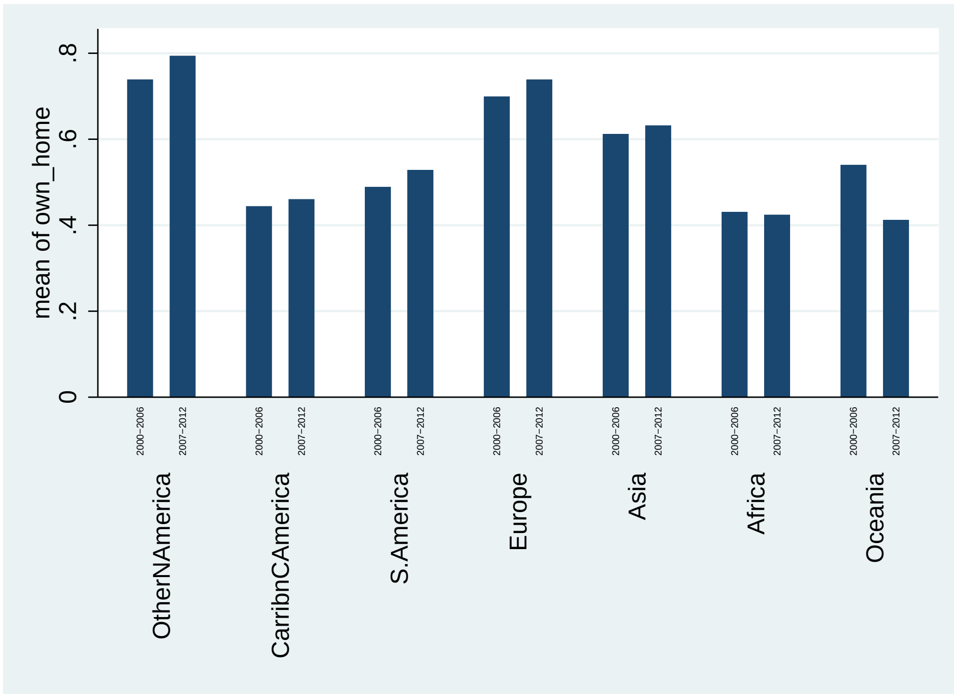

Figure 3: Changes in Homeownership by birthplace continent over time

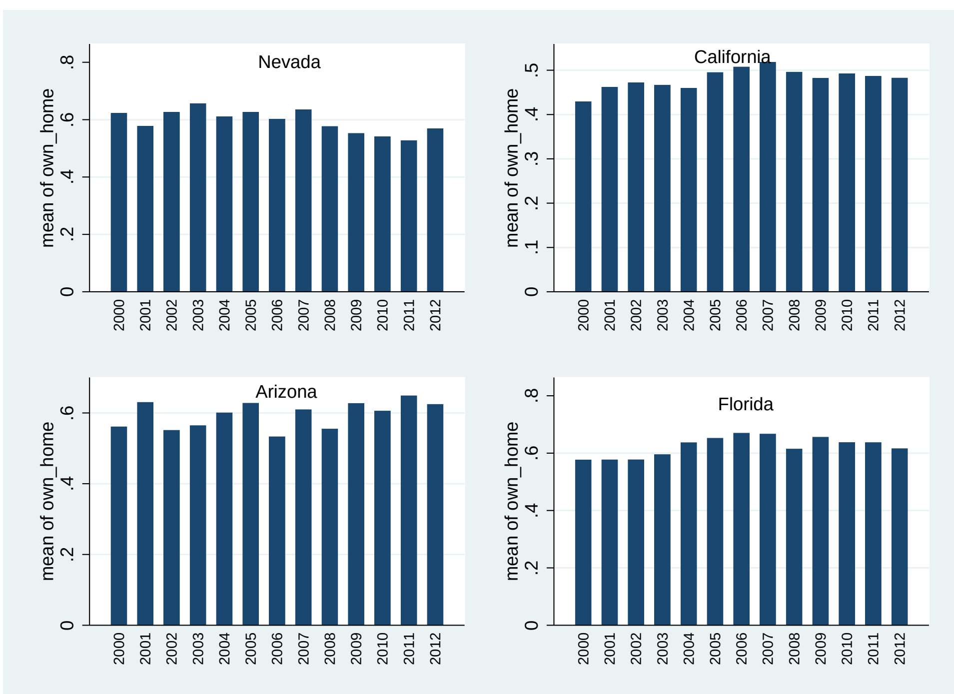

Figure 4: Changes in Homeownership over Time across select States

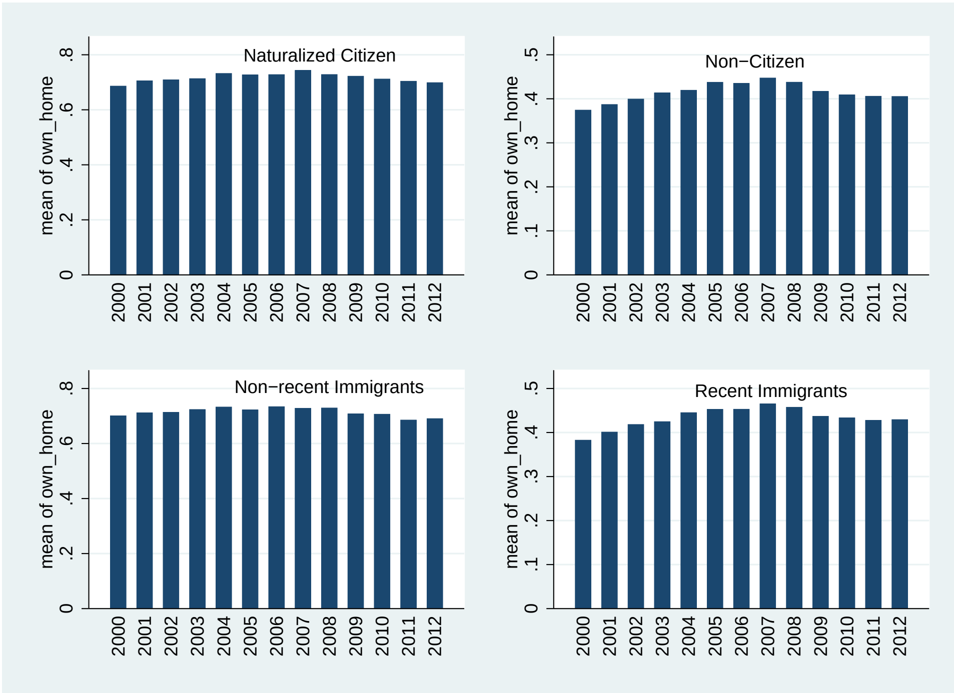

Figure 5: Changes in Homeownership by Citizenship Status and Length of Stay

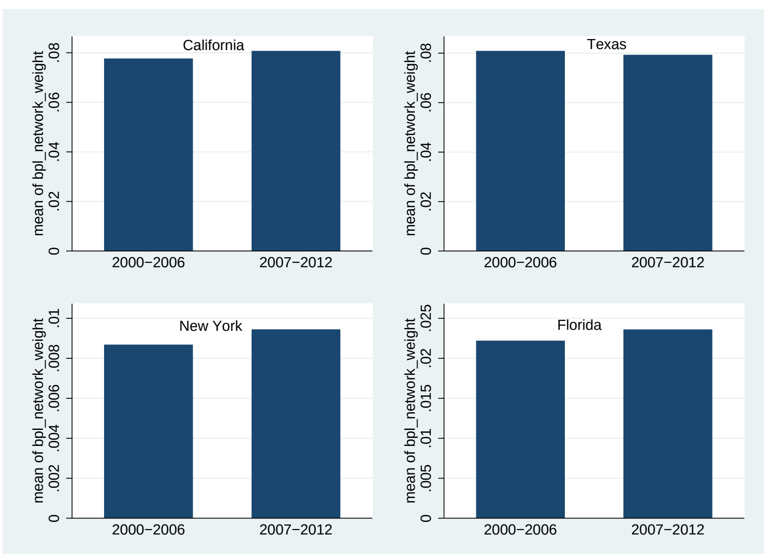

Figure 6: Changes in Birth Place Network in Select States

Tables

Table 1: Homeownership Rates: Pre and Post the Great Recession

Period	Immigrant Rate	U.S born Rate
	(Standard Deviation)	(Standard Deviation)
Pre Recession	52.41%	74.27%
(2000-2006)	(0.50)	(0.44)
Recession and onward	54.32%	72.42%
(2007-2012)	(0.50)	(0.44)

Table 2: Summary Statistics by Birth Place Continent

	Other North America	Central America/ Caribbeans	South America	Europe	Asia	Africa	Oceania
Years in	24.24	15.75	15.06	22.99	15.95	11.90	15.16
the U.S	(17.93)	(11.59)	(11.71)	(16.97)	(11.72)	(10.26)	(12.92)
N	6207	153046	21490	33038	78195	11442	2032
Home	0.762	0.452	0.508	0.717	0.623	0.446	0.466
Ownership	(0.426)	(0.498)	(0.500)	(0.451)	(0.485)	(0.497)	(0.499)
N	6207	153043	21490	33042	78202	11444	2032
Estimated	77696.68	9347.12	24869.48	64997.37	39746.34	30917.85	30588.63
Saving (CD)	(518380.8)	(168261.1)	(270294.3)	(462160.7)	(360204.8)	(364139.7)	(218930.4)
N	5724	142702	20108	31110	73554	10394	1831
Estimated	351965.6	42396.65	111993.4	289875.5	184231.1	142889.8	146193.4
Saving(BSR)	(2123516)	(677683.6)	(1015782)	(1796910)	(1533987)	(1639090)	(1082429)
N	5754	142702	20108	31110	73554	10394	1831
Interest	998.19	116.38	336.31	872.49	507.47	349.44	446.99
Income	(4503.93)	(1544.22)	(2784.59)	(4239.81)	(3235.3)	(2890.14)	(3177.38)
N	5754	142702	20108	31110	73554	10394	1831
Birth Place Network	0.005	0.068	0.005	0.003	0.01	0.002	0.004
in state	(0.004)	(0.059)	(0.005)	(0.003)	(0.018)	(0.002)	(0.006)
N	6207	153053	21490	33042	78202	11444	2032
Share	0.415	0.283	0.404	0.549	0.529	0.41	0.350
naturalized	(0.493)	(0.451)	(0.491)	(0.498)	(0.499)	(0.492)	(0.478)
N	6207	153043	21490	33042	78202	11444	2032
Age	45.92	37.65	40.20	47.44	42.04	36.73	38.29
	(20.1)	(16.41)	(16.84)	(20.08)	(17.54)	(16.14)	(17.88)
N	6207	153043	21490	33042	78202	11444	2032

Note: All monetary values are in real terms. The network variable captures the share of population of a state from your birth country averaged over birth continent. BSR means bank savings rate.

Table 3: Savings Levels (CD) and Interest Income: Pre Recession and GRA period by Place of Birth

	Savings (CD)		Interest Income	
Period	Pre Recession	2007-2012	Pre Recession	2007-2012
	(1)	(2)	(4)	(5)
		Part A: Citizenship Status		
Naturalized	27464.56	62510.63	682.41	520.81
SD	(177590)	(489236.6)	(3899.93)	(3242.143)
N	56419	61772	56419	61772
Non-citizen	7301.083	19645.17	185.77	150.56
SD	(83408.98)	(303869.7)	(1908.14)	(1752.15)
N	89180	83113	89180	83113
		Part B: Length of Stay		
Over 20 years	29683.39	64964.46	739.41	527.47
SD	(185509.2)	(529191.4)	(4073.851)	(3355.89)
N	51627	58870	51627	58870
Recent Immigrant	7110.30	19411.94	179.78	158.50
SD	(81238.31)	(263365.4)	(1857.068)	(1675.88)
N	93972	86015	93972	86015

Table 4: Factors that are Correlated with Homeownership before the Recession and beyond

	(1)	With Naturalized citizen (2)	Add household income (3)	Add wage income (4)	Add total income (5)
Sex	0.035***	0.033***	0.039***	0.071***	0.057***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Age	0.004***	0.004***	0.004***	0.005***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family size	0.070***	0.070***	0.056***	0.071***	0.070***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Education	0.018***	0.016***	0.009***	0.014***	0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Years in the U.S.	0.014***	0.011***	0.011***	0.011***	0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Naturalized		0.137***	0.129***	0.143***	0.132***
		(0.006)	(0.005)	(0.005)	(0.005)
Log Hhld inc			0.142***		
			(0.004)		
Log wage				0.048***	
				(0.003)	
Log total inc					0.015***
					(0.001)
Sex × 2007 - 2012	0.004	0.003	0.004	0.005	0.006
	(0.004)	(0.004)	(0.004)	(0.006)	(0.005)
Age× 2007 - 2012	0.000*	0.000*	0.000*	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family Size× 2007 - 2012	-0.011***	-0.011***	-0.010***	-0.010***	-0.010***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Education × 2007 - 2012	0.001	0.000	-0.001	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Years in the U.S. × 2007 - 2012	-0.001***	-0.001***	-0.001***	-0.002***	-0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Naturalized × 2007 - 2012		0.010	0.011	0.008	0.008
		(0.008)	(0.008)	(0.009)	(0.008)
Log Hhld income × 2007 - 2012			0.011*		
			(0.006)		
Log wage × 2007 - 2012				0.007**	
				(0.004)	
Log total inc × 2007 - 2012					0.009***
					(0.002)
N	290466	290466	286946	185487	240773

**Note:* *This table summarizes the estimates of a regression model of homeownership with fixed effects for state and year. Other variables we control for not shown in the summary above are:.Employment dummies, Metro area dummies, Marital status dummies and birth continent dummies. The interaction of each of these variables and 2007-2012 dummy is also included in the analysis.* * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: The Role of Savings in Homeownership before the Recession and beyond

	Interest Income (1)	Recovered Savings with CD (2)	Recovered Savings with Bank Interest (3)	Recovered Savings Mean of CD and Bank Interest (4)
Sex	0.038***	0.038***	0.038***	0.038***
	(0.003)	(0.003)	(0.003)	(0.003)
Age	0.004***	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Family size	0.058***	0.058***	0.058***	0.058***
	(0.002)	(0.002)	(0.002)	(0.002)
Education	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
Years in the U.S.	0.010***	0.010***	0.010***	0.010***
	(0.000)	(0.000)	(0.000)	(0.000)
Naturalized	0.128***	0.127***	0.127***	0.127***
	(0.006)	(0.006)	(0.006)	(0.006)
Log Hhld inc	0.133***	0.133***	0.133***	0.133***
	(0.005)	(0.005)	(0.005)	(0.005)
Log Interest Income	0.016***			
	(0.001)			
Log Savings CD		0.011***		
		(0.001)		
Log Savings BI			0.009***	
			(0.001)	
Log Savings mean of				0.010***
CD and BI				(0.001)
Sex × 2007 - 2012	0.005	0.005	0.005	0.005
	(0.004)	(0.004)	(0.004)	(0.004)
Age× 2007 - 2012	0.000*	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Family Size	-0.010***	-0.010***	-0.010***	-0.010***
× 2007 - 2012	(0.003)	(0.003)	(0.003)	(0.003)
Education	-0.001	-0.001	-0.001	-0.001
× 2007 - 2012	(0.001)	(0.001)	(0.001)	(0.001)
Years in the U.S.	-0.001***	-0.001***	-0.001***	-0.001***
× 2007 - 2012	(0.000)	(0.000)	(0.000)	(0.000)
Naturalized	0.011	0.011	0.011	0.011
× 2007 - 2012	(0.008)	(0.008)	(0.008)	(0.008)
Log Hhld income	0.013**	0.013**	0.013**	0.013**
× 2007 - 2012	(0.006)	(0.006)	(0.006)	(0.006)
Log Interest Income	-0.001			
× 2007 - 2012	(0.001)			
Log Savings CD		-0.002**		
× 2007 - 2012		(0.001)		
Log Savings BI			-0.001*	
× 2007 - 2012			(0.001)	
Log Savings mean of CD and BI				-0.001*
×2007 - 2012				(0.001)
N	286946	286946	286946	286946

**Note:* *This table summarizes the marginal effect estimates of a probit model of homeownership. Other variables we control for not shown in the summary above are:Employment dummies, Metro area dummies, Marital status dummies, State and Year fixed effects and birth continent dummies. The interaction of each of these variables and 2007-2012 dummy is also included in the analysis.* $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$

Table 6: The Role of Birthplace Networks in Homeownership before the Recession and beyond

	Interest Income	Savings with CD	Savings with Bank Interest	Savings from Mean of CD and Bank Interest
	(1)	(2)	(3)	(4)
Sex	0.039***	0.038***	0.038***	0.038***
	(0.003)	(0.003)	(0.003)	(0.003)
Age	0.004***	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Family size	0.058***	0.058***	0.058***	0.058***
	(0.002)	(0.002)	(0.002)	(0.002)
Education	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
Years in the U.S.	0.010***	0.010***	0.010***	0.010***
	(0.000)	(0.000)	(0.000)	(0.000)
Naturalized	0.129***	0.128***	0.128***	0.128***
	(0.005)	(0.005)	(0.005)	(0.005)
Log Hhld Inc	0.133***	0.133***	0.133***	0.133***
	(0.005)	(0.005)	(0.005)	(0.005)
Log Interest Income	0.016***			
	(0.001)			
Log Saving CD		0.011***		
		(0.001)		
Log Savings BI			0.009***	
			(0.001)	
Log Savings mean of				0.010***
CD and BI				(0.001)
Birth Place Network	0.224***	0.224***	0.225***	0.225***
	(0.085)	(0.085)	(0.085)	(0.085)
Birth Place Network	0.249**	0.248**	0.248**	0.248**
× 2007-2012	(0.113)	(0.113)	(0.113)	(0.113)
Sex× 2007 - 2012	0.005	0.005	0.005	0.005
	(0.004)	(0.004)	(0.004)	(0.004)
Age× 2007 - 2012	0.001*	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
Family Size	-0.011***	-0.011***	-0.011***	-0.011***
× 2007 - 2012	(0.003)	(0.003)	(0.003)	(0.003)
Education	-0.000	-0.001	-0.001	-0.001
× 2007 - 2012	(0.001)	(0.001)	(0.001)	(0.001)
Years in the U.S.	-0.001***	-0.001***	-0.001***	-0.001***
× 2007 - 2012	(0.000)	(0.000)	(0.000)	(0.000)
Naturalized	0.012	0.013	0.013	0.013
× 2007 - 2012	(0.008)	(0.008)	(0.008)	(0.008)
Log Hhld income	0.013**	0.013**	0.013**	0.013**
× 2007 - 2012	(0.006)	(0.006)	(0.006)	(0.006)
Log Interest Income	-0.001			
× 2007 - 2012	(0.001)			
Log Savings CD		-0.002*		
× 2007 - 2012		(0.001)		
Log Savings BI			-0.001*	
× 2007 - 2012			(0.001)	
Log Savings mean of CD and BI				-0.001*
×2007 - 2012				(0.001)
N	286946	286946	286946	286946

**Note:* *This table summarizes the marginal effect estimates of a probit model of homeownership. Other variables we control for not shown in the summary above are:Employment dummies, Metro area dummies, Marital status dummies, State and Year fixed effects and birth continent dummies. The interaction of each of these variables and 2007-2012 dummy is also included in the analysis.* * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Does the role of Birth Place Networks differ with the Citizenship and Years in the U.S.?

	Interest Income (1)	Savings with CD (2)	Savings with Bank Interest (3)	Savings from Mean of CD and Bank Interest (4)
Panel A: Does the effect of Birthplace Network differ across Citizenship				
Citizenship	0.120***	0.120***	0.120***	0.120***
	(0.006)	(0.006)	(0.006)	(0.006)
Birth Place Network	0.155*	0.157*	0.159*	0.159*
	(0.092)	(0.092)	(0.092)	(0.092)
Citizenship × Birth Place Network	0.257***	0.250***	0.248***	0.249***
	(0.088)	(0.088)	(0.088)	(0.088)
Citizenship × 2007 - 2012	0.013	0.013	0.013	0.013
	(0.008)	(0.008)	(0.008)	(0.008)
Birth Place Network × 2007 - 2012	0.242*	0.240*	0.240*	0.241*
	(0.126)	(0.125)	(0.125)	(0.125)
Citizenship × BPN × 2007 - 2012	-0.024	-0.019	-0.020	-0.020
	(0.131)	(0.129)	(0.130)	(0.130)
Panel B: Does the effect of Birthplace Network differ with Years in the U.S.				
Recent Immigrant	0.017*	0.017*	0.016*	0.016*
	(0.009)	(0.009)	(0.009)	(0.009)
Birth Place Network (BPN)	0.372***	0.367***	0.366***	0.367***
	(0.097)	(0.097)	(0.097)	(0.097)
Recent Immigrant × Birth Place Network	-0.230***	-0.222***	-0.220***	-0.221***
	(0.070)	(0.071)	(0.071)	(0.071)
Recent Immigrant × 2007 - 2012	0.013	0.013	0.013	0.013
	(0.013)	(0.012)	(0.012)	(0.012)
Birth Place Network × 2007 - 2012	0.294**	0.297**	0.298**	0.298**
	(0.132)	(0.132)	(0.132)	(0.132)
Recent Immigrant × BPN × 2007 - 2012	-0.128	-0.135	-0.136	-0.136
	(0.117)	(0.117)	(0.117)	(0.117)
N	286946	286946	286946	286946

***Note: This table summarizes the marginal effect estimates of a probit model of homeownership. With a focus on the change in the impact of network interacted with citizenship status or network interacted with whether an individual is a new immigrant (less than 20 years in the U.S). Other variables we control for not shown in the summary above are:Age, Education, Years in the U.S, Savings (4 proxies), Citizenship status, Gender, Employment dummies, Metro area dummies, Marital status dummies, State and Year fixed effects and birth continent dummies. The interaction of each of these variables with a 2007-2012 dummy is also included in the analysis.* * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$