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The Performance of Non-Owner-Occupied Mortgages During the Housing Crisis

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The past decade has seen a dramatic rise and fall in home values within the United States, causing policymakers to contemplate their cause and solution. Much of the attention and blame for the rise in mortgage delinquencies and foreclosures has been attributed to mortgages that were originated to subprime homeowners. These homeowners have high loan-to-value ratios, high debt-to-income ratios, low credit scores, and little or no documentation of income.[1] In addition to rising risk, other factors contributed to the housing crisis. For example, changes in economic conditions like higher unemployment rates led to a lower capacity for homeowners to meet their mortgage obligations.[2]

In an attempt to limit the impact of the housing crisis and to help stimulate a housing recovery, policymakers have proposed a number of foreclosure mitigation programs to help homeowners that are owner occupants. Unfortunately, none of the programs initiated to help slow down the housing crisis

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[1] Doms and Krainer (2007) find an increase in riskiness in the pool of potential homeowners around the expansion of the subprime market. Bhardwaj and Sengupta (2008) find that underwriting standards did not universally decline prior to the housing crisis, especially in the subprime market.

[2] Campbell and Dietrich (1983) and Deng, Quigley, and van Order (2000) find a positive relationship between unemployment rate and mortgage default.

were able to achieve the goals stated by policymakers.[3] One possible reason why these programs have not been successful is that there are multiple causes of the housing crisis. The lack of success of these programs suggests that a public policy approach to combat mortgage delinquencies and foreclosures needs to be flexible and multidimensional in order to be effective.

One segment of the housing market that has received little attention from policymakers and the press is the plight of homeowners who do not reside in their home. This group of homeowners is typically identified as non-owner occupants, which includes investors in residential properties and owners of vacation homes. The 2003 American Housing Survey produced by the Harvard Center for Housing Studies found that 35 percent of American renters lived in single-unit housing and another 21 percent live in two- to four-unit structures. In other words, non-owner occupants provided about half of the single-family housing for renters in the United States in 2003. However, it is not known how mortgages to non-owner occupants performed during the housing crisis.

In this article, I investigate the size and importance of the non-owner occupant housing market prior to the housing crisis. Using two nationally representative data sets for mortgage originations, I show that prior to the housing crisis, the size of the mortgage market for non-owner occupants grew at a faster pace when compared to owner occupants.

In order to explore the impact of the housing crisis on non-owner occupants, I use two measures of mortgage performance. The first is foreclosure rates. Using aggregate data on owner and non-owner occupant mortgages, the results show that foreclosures rates for the two groups are similar. One possible explanation for this result is that non-owner occupants are held to a higher underwriting standard, which may help mitigate perceived differences in default.

The second measure of mortgage performance is a prevalence and performance index. Using state-level data, a number of states received high impact measures during the housing crisis, but the source of their impact varies by region of the country. For example, the driving factor for a high impact ratio for states in the Midwest is poor mortgage performance. This result is very different for states in the South and West where high impact ratios are driven mostly by a high concentration of non-owner occupant mortgages. In other words, the impact of the housing crisis on non-owner occupied mortgages is widespread, but the source of their impact varies by region. Not surprising, the states identified in this study are the same states that are identified in the press as being the hardest hit during the housing crisis.

[3] Programs that have been initiated during the housing crisis include the Federal Deposit Insurance Corporation's "Mod in a Box," Hope for Homeowners, and the Home Affordable Mortgage Program, among others.

The remainder of this article is organized as follows: Section 1 presents a discussion on the motivation behind foreclosure, and Section 2 provides a discussion of the data. Section 3 provides evidence of the impact of foreclosures in the housing market from non-owner occupants, and the results are summarized Section 4.

1. MOTIVATION BEHIND FORECLOSURE: THEORY

Policymakers have wondered if mortgage holders who use their homes as investment properties played a role in contributing to the current housing crisis. "Investors" are defined as those individuals who do not use their home as their primary residence, but to generate revenue. Answering this question is difficult—the main hurdle facing researchers is that data limitations make it difficult to measure home purchase activity for this particular group of homeowners. However, data is available if I broaden my focus to include both investors and owners of second homes. I define a second homeowner as an individual who purchases a non-primary residence for recreational use as an occasional or seasonal residence. This broader group of investors and second homeowners is defined as non-owner occupants.[4]

The post-origination performance of mortgages has been the subject of academic research, but almost all of it, both empirical and theoretical, has focused on the performance of homeowners in their primary residence.[5] A few studies of owner occupants indirectly provide insight into the behavior of non-owner occupants. For example, studies like Cowan and Cowan (2004) and Immergluck and Smith (2004) find that foreclosure rates are higher among non-owner occupants even after controlling for credit scores and other risk factors.

They contend that the decision of the mortgage holder to become delinquent or enter foreclose depends on the homeowner's ability and willingness to repay his/her mortgage. Other studies, including Bajari, Chu, and Park (2008) and Haughwout, Peach, and Tracy (2008), find that non-owner occupants are more likely to exercise their option to default even after controlling for other factors. In addition, Gerardi, Shapiro, and Willen (2008) find a similar result when using condominiums and multifamily dwellings as proxies for loans to non-owner occupants.

There are two theories that have been proposed to help explain why homeowners enter foreclosure: "trigger-event" theory and "options" theory.[6] Trigger-event theory states that an individual may experience a life-changing

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[4] A single-family home is defined as a detached structure with one to four residents, a townhouse, or a condominium contained in a larger building but available for sale separately.

[5] Quercia and Stegman (1992) and Vandell (1995) provide a nice review of the literature.

[6] See Avery, Brevoort, and Canner (2008).

event that negatively impacts the homeowner's ability to meet his/her financial obligations. Typically, trigger events lead to disruptions in income or an expansion in expenses due to a loss of employment, change in marital status, or a health-related event.[7] In other words, when a financial hardship occurs, the homeowner is less likely to remain current on his/her mortgage and other financial obligations.

While trigger-event theory helps explain mortgage foreclosures that are driven by factors outside the homeowner's direct control, it does not explain those situations where the homeowner is making a conscious decision to allow foreclosure to occur, even when the homeowner's current financial situation may not have changed. Under option theory, the homeowner has an incentive to walk away from his/her home when the value of the home is less than the amount owed on the mortgage.[8] Option theory does not suggest that homeowners will always walk away from their home or will do so immediately after finding themselves in a negative equity position. Homeowners may delay exercising their option to pay their mortgage if they believe that housing values are not likely to increase in the near future.[9] In addition, homeowners may not exercise their foreclosure option even if they believe housing values may not appreciate to the full cost of the home given that foreclosure is not without costs. Owner occupants face sizeable transaction costs associated with foreclosure that directly impact the homeowners' credit reports and will reduce their access to credit and increase borrowing costs in the future.

Gerardi, Shapiro, and Willen (2008) use a theoretical model for foreclosure where homeowners enjoy a stream of monetary and non-monetary benefits from homeownership. I contend that ownership status is a factor in determining how quickly a homeowner will initiate foreclosure under option theory. The reason for a difference in the value of the foreclosure option associated with ownership status is that different owners place different values on the financial and non-financial benefits associated with homeownership. For example, given that owner occupants reside in the home full time where they are likely to develop an emotional attachment to their home, they are likely to place a higher value on the non-monetary benefits associated with homeownership. As a result, owner occupants are less likely to exercise their foreclosure option even when there is a decline in the potential monetary benefits of homeownership.

On the other extreme, non-owner occupants are more likely to initiate foreclosure, for they are more likely to place a higher value on the potential

[7] See Vandell (1995); Elmer and Seelig (1999); and Deng, Quigley, and Van Order (2000).

[8] Bajari, Chu, and Park (2008); Foote, Gerardi, and Willen (2008); Haughwout, Peach, and Tracy (2008); and Bhutta, Dokko, and Shan (2010) find that negative equity is highly correlated with higher default rates.

[9] See Hendershott and Van Order (1987); Kau, Keenan, and Kim (1994); and Kau and Keenan (1995).

monetary benefits of homeownership. Since non-owner occupants do not reside in the home full time, they consume less of the non-monetary benefits of homeownership.[10] As a result, non-owner occupants will place a higher value on rental income and capital gains generated from homeownership, net of holding costs.[11] Among the groups of non-owner occupants, second homeowners represent a hybrid group, for they are likely to fall in between investors and owner occupants regarding their willingness to exercise their foreclosure option. They place a higher value on their foreclosure option when compared to owner occupants, but a lower value relative to investors. One reason why second homeowners are different is that they occupy their second homes more frequently than investors, causing them to place a higher value on the non-financial benefits of homeownership. However, second homeowners are more likely to place a higher value on the monetary benefits of their second home when compared to the primary residence inhabited by owner occupants. Specifically, second homeowners are more likely to use their second home to generate rental income and are more likely to dispose of their second home if a financial opportunity arises.

2. DATA

The data used in this article come from LPS Applied Analytics, Inc. I collect loan origination data for the time period 2004–2007. Individual loans originated for my sample are followed starting at their origination date and ending when the loan is foreclosed or refinanced. If the loan remains active for the whole time period, then the last observation date of record is June 2011. LPS provides loan-level data compiled from the largest loan servicers and covers around 67 percent of the U.S. mortgage market for the period analyzed in this study.[12] One of the benefits of the LPS data is that loan-level information is available at the time of origination, including the risk characteristics of the borrower. Specific variables such as loan amount, appraisal value, and borrower income can be found in the data. In addition, LPS provides information that can be used as a proxy for the riskiness of the borrower. Such information includes the borrower's credit rating (FICO score), loan-to-value, and debt-to-income ratios at the time of origination.

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[10] "Ruthlessness" is an extreme variant of "option" theory. In this case, the borrower is assumed to have no emotional attachment to his/her home, creating an incentive for the borrower to view the homeownership decision strictly as a financial transaction.

[11] Gerardi, Shapiro, and Willen (2008) note that non-owner occupants face a number of disadvantages, such as public assistance to delinquent borrowers usually targets owner-occupants. In addition, since non-owner occupants must either forgo rental income or seek tenants, the search for tenants involves administrative costs and risks, like property damage from renting or lost income when tenants fail to remain current on their rent.

[12] Cordell, Watson, and Thomson (2008) provide additional detail and insight into the LPS data.

In addition to applicant information that is reported at the time the loan is originated, LPS provides loan-level performance data for each month the loan remains active with the reporting loan servicer. For example, the borrower's payment status is provided (payment, prepayment, or default), including whether the borrower's loan is current (30-, 60-, or 90-days delinquent). For the purposes of this study, I will focus my attention on loan defaults that are caused by foreclosure.

Additional data used in this study are provided by the Home Mortgage Disclosure Act (HMDA) for the time period 1996–2006. The HMDA data provides loan-level information for borrowers at the time of origination. One of the primary differences between the LPS and HMDA data sets is that HMDA provides loan-level information by lender and includes information on the race and sex of the borrower.

As a supplement to the HMDA data, data obtained from the National Association of Realtors (NAR) are used to acquire home sales data for the time period 2003–2007. One of the benefits of using the NAR data is that home sales to non-owner occupants can be disaggregated into either second homeowners or investors. The HMDA data distinguishes between owner and non-owner occupants at the time of origination, but within the non-owner occupant group, HMDA does not provide the same level of detail.

3. EVIDENCE OF SIGNIFICANCE AND IMPACT ON FORECLOSURES TO NON-OWNER OCCUPANTS

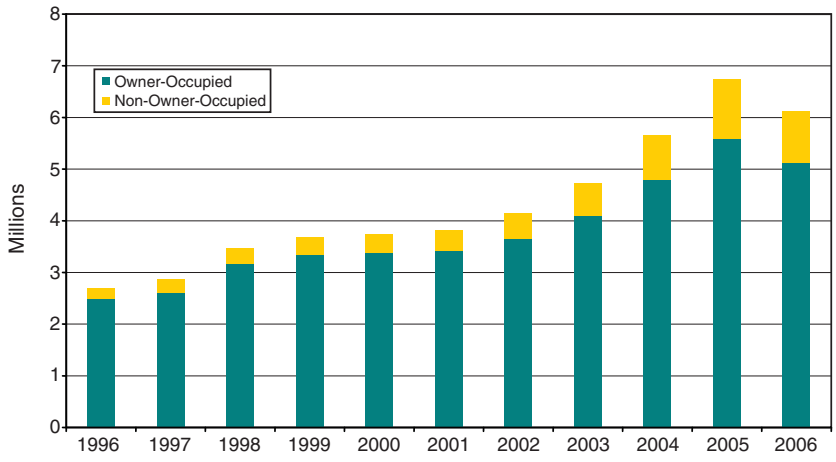
Growth in Mortgage Market

Before I start to explore the role that non-owner occupants played in the housing crisis by analyzing measures like foreclosure rates, I need to identify the size of the housing market controlled by non-owner occupants.[13] Using data from HMDA, Figure 1 provides a breakdown of the number of mortgages originated by ownership type. In 2000, the role non-owner occupants played in the home purchase market was fairly small, constituting about 8 percent of the first lien mortgages originated. However, the share of first lien mortgages originated to non-owner occupants increased over time, reaching a peak of almost 16 percent in 2005.

Data on home sales is provided by NAR in Figure 2. In 2003, home sales for primary residents were slightly more than 4.5 million units, while home sales to non-owner occupants were almost 2.25 million units. Similar to the pattern observed in the HMDA data, home sales to non-owner occupants were largest in 2005, where they reached almost 3.5 million units.

[13] Avery, Brevoort, and Canner (2008) find a positive relationship between the share of mortgages originated to non-owner occupants and delinquency rates.

Figure 1 Mortgage Originations for Home Purchase by Occupancy Type

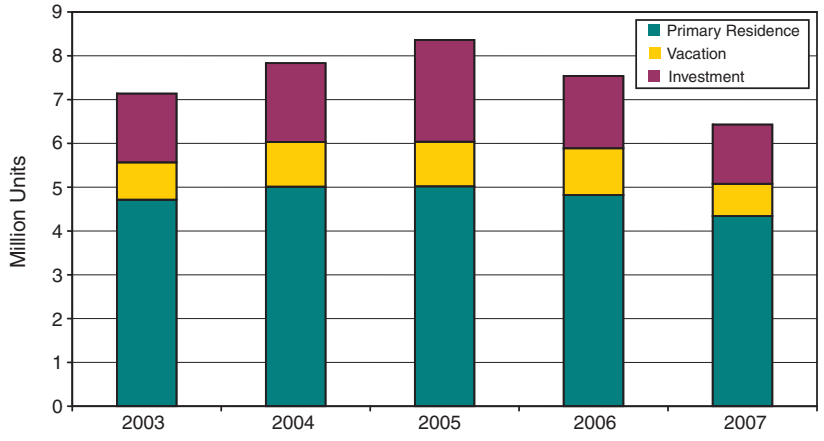


When using growth rates as a measure of the significance of the housing market controlled by non-owner occupants, the data presented in Figure 2 show a similar story. Data from the NAR for the time period prior to the housing crisis show that home buying activity by non-owner occupants grew faster than activity by owner occupants. For example, during the time period 2003–2005, home purchases by investors increased almost 50 percent, while home purchases to owner occupants rose just 6.4 percent. A similar result exists when using HMDA data. For example, home purchase mortgage originations to non-owner occupants rose 84 percent between 2003 and 2005. Over the same time period, originations to owner occupants rose by 36 percent.

The data from both HMDA and NAR show that non-owner occupants played a sizeable and increasing role in the housing market prior to the housing crisis.[14] However, while the size of the market for non-owner occupants provides added justification for studying them separately as an ownership

[14] The results presented using HMDA and NAR data show that non-owner occupants played an increasing role in the housing market prior to the housing crisis. However, the relative size of mortgages originated to non-owner occupants is quite different between the two data sources. There are several explanations why HMDA and NAR provide different numbers. For example, the data provided in NAR come from a survey, whereas HMDA captures actual home purchases using mortgages. However, HMDA data may not provide a complete picture of originations in the mortgage market. For example, HMDA only provides data on homes that are purchased using a mortgage (no cash purchases). In addition, reporting requirements cause HMDA to underrepresent mortgages originated by small lenders and lenders in rural markets. Also, for those homeowners who use both a first and second mortgage to purchase a home, both mortgages show up in the data as if two separate homes were being purchased. Avery, Brevoort, and Canner (2008) show that

Figure 2 Home Sales for Owner Occupants, Second Homeowners, and Investors



group, their size and growth leading up to the housing crisis does not mean that they played a significant role.[15]

Housing Prices

I argue above that non-owner occupants are more likely to view homeownership as a profit opportunity. This suggests that non-owner occupants may be attracted to areas of the country where housing values are rising more rapidly. It is also possible that this causation will flow in the opposite direction. For example, non-owner occupants may expect housing values to increase in the future, causing them to buy housing in anticipation of future price appreciation.

While the direction of the relationship between home prices and non-owner occupant buying activity will not be determined in this study, I can identify the strength of this relationship prior to the housing crisis. Figure 3 uses state data to compute cross-sectional correlations between the lagged

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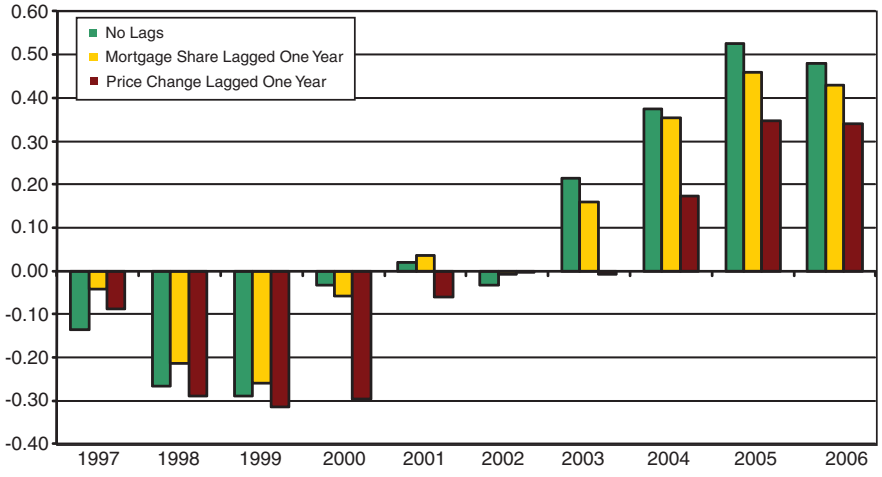
first and second mortgages for single home purchases increased substantially prior to the housing crisis (2004–2006).

[15] HMDA and LPS data may underreport the number of mortgages held by non-owner occupants. Both HMDA and LPS depend on homeowners to self-report the occupancy status of the home, and LPS also relies on self-reporting to distinguish second homes from investment properties. Differences in underwriting standards based on the occupancy and usage of the home creates an incentive to misreport homeowners' true intentions.

Figure 3 Cross-State Correlations Between Non-Occupants' Share of Home-Purchase Mortgage Originations and Annual Percentage Changes in Housing Prices, 1997–2006



one-year percentage change in home prices and the share of mortgage originations to non-owner occupants (red bar). Because the direction of the causation is unknown, a correlation is also calculated between the lagged one-year share of mortgages originated to non-owner occupants and the percent change in home values (yellow bar). Lastly, the green bar shows the correlation between both variables using no lags. Coming into the 21st century, the two variables in Figure 3 show a strong negative correlation. In other words, the relationship between mortgage origination activity by non-owner occupants and home prices is negative. However, contrary to the earlier results, all three correlation measures experience a strong positive relationship prior to the housing crisis. These results show that the share of originations to non-occupant owners either mirrored appreciation in home prices or were a contributing factor. In other words, the results indicate that, just prior to the

housing crisis, non-owner occupants played a positive role in contributing to a run up in housing prices.[16,17]

Risk Characteristics

As stated previously, theory suggests that non-owner occupants are expected to have a higher mortgage foreclosure rate. If theory parallels reality, I would expect higher underwriting standards for non-owner occupants in order to help mitigate the higher perceived risk associated with their foreclosure option.[18] Higher underwriting standards for non-owner occupants would take the form of higher income and FICO scores, while having lower loan-to-income, debt-to-income, and mortgage amount.

Figures 4, 5, 6, and 7 use data from HMDA and LPS at the time of origination to compare borrower risk profiles for owner occupants and non-owner occupants. Using HMDA data, Figure 4 reports borrower income by state for first lien originations disaggregated by occupancy type. The data show that owner occupants have a lower median income when compared to non-owner occupants. This result is even more striking given that only in the case of owner occupants that purchased homes in California does the average income meet or exceed the median income level for non-owner occupants. In a typical state, the median income for owner occupants ranges from $60,000 in 2004 to $65,000 in 2007. For the same time period, the median income for non-owner occupants is considerably higher, ranging from $100,000 to $125,000 for the same period.

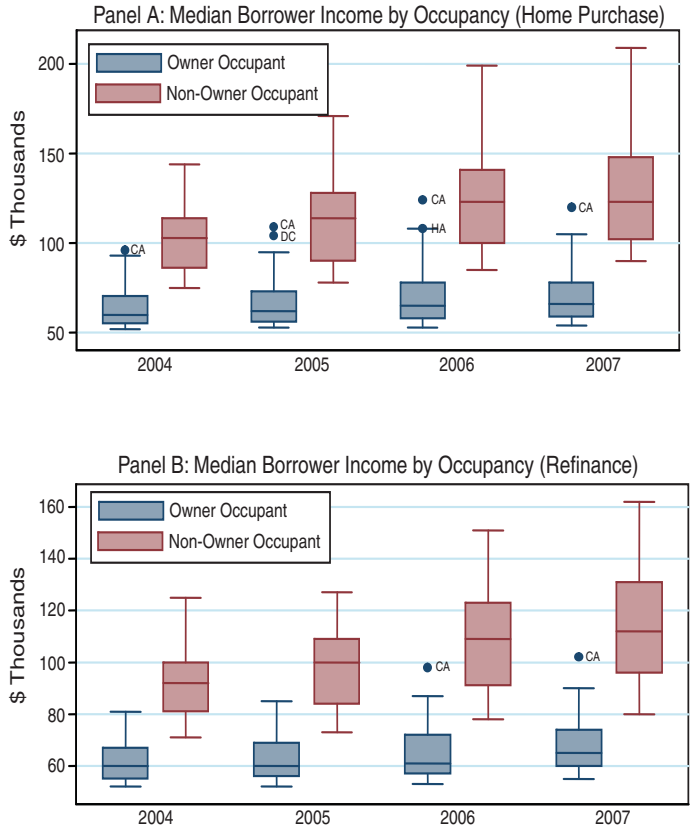
In order to observe differences in credit quality without using income by ownership type, it is necessary to use LPS data. As mentioned earlier, the LPS data has the ability to identify those homeowners who classify themselves as either investors or second homeowners. Based on the discussion above, non-owner occupants are more likely to exercise their foreclosure option when compared to owner occupants. Among the group of non-owner occupants, second homeowners are expected to be less likely to exercise their foreclosure option when compared to investors because second homeowners place more value on the non-monetary benefits associated with homeownership. Figure 5 presents FICO scores for occupant owners, second homeowners,

[16] For the years just prior to the housing crisis, the highest correlations in Figure 3 are for the contemporaneous results and the lowest correlations are when the housing price appreciation variable is lagged. It is also important to note that there is a slight asymmetry between the two correlations using lagged variables, but this result is similar to Wheaton and Lee's (2008) findings on lead-lag relationships between sales and prices for total home purchases.

[17] Wheaton and Nechayev (2008) find that the share of non-owner occupant mortgage activity is positively correlated with errors in forecasting housing prices.

[18] See Vandell (1995) for a survey of the empirical literature on mortgage default and a discussion of individual variables in the default decision.

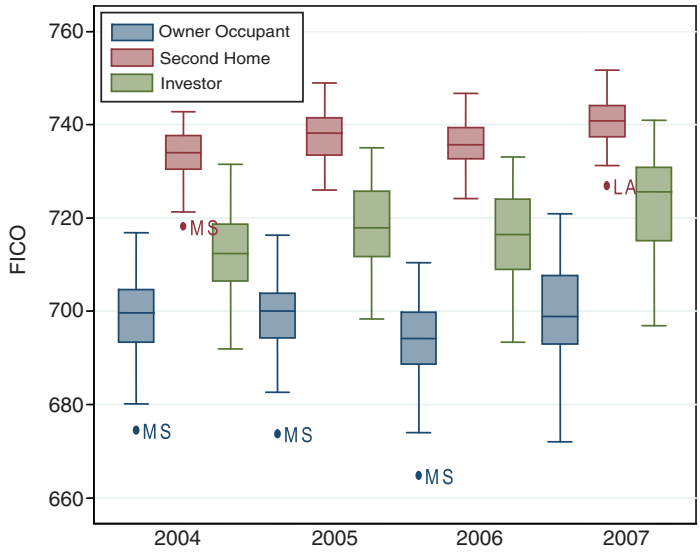
Figure 4 Distributions Across States for the Median Income of Owner Occupant and Non-Owner Occupant Mortgage Borrowers, by Loan Purpose and Year of Origination (HMDA)



Notes: The data are median applicant income for each state and the District of Columbia, segregated by occupancy. The line in each box represents the median incomes across the 50 states and the District of Columbia. Each box covers the interquartile range for income (25th percentile and 75th percentile) of the distribution. The "whiskers" extend beyond the box either to the end of the distribution or to a length of 1.5 times the interquartile range, whichever comes first. The dots beyond the whiskers are classified as extreme outliers and these dots are identified by their state code.

and investors. The data from Figure 5 show that at the time of origination, occupant owners consistently have a lower median FICO score when compared to non-owner occupants. Among the two groups of non-owner occupants, second homeowners consistently have a higher median FICO score. This result seems surprising given that it was hypothesized that second

Figure 5 Distribution Across States for the Mean FICO Score of Owner Occupant and Non-Owner Occupant Mortgage Borrowers, by Year of Origination (LPS)

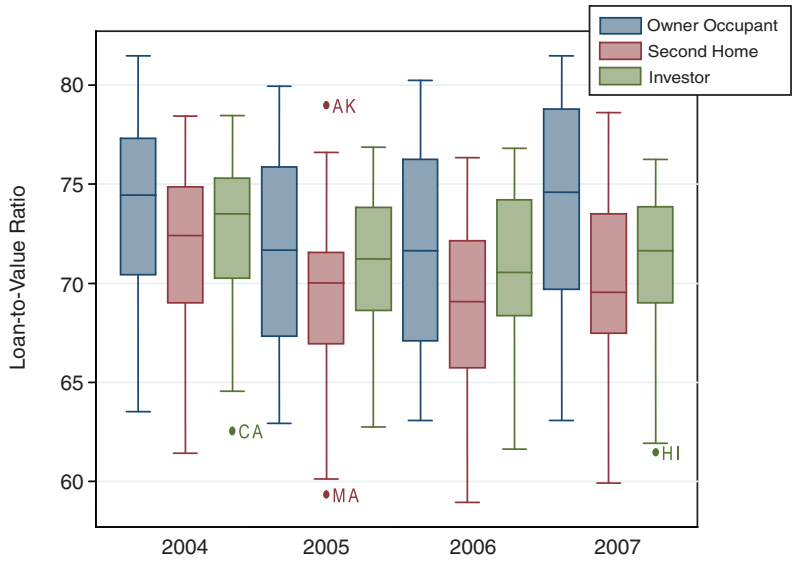


Notes: The data represent the mean FICO score for each state and the District of Columbia, segregated by occupancy. Loans that have a loan-to-value ratio that exceeds 400 are dropped from the sample.

homeowners would be less likely to exercise their default option when compared to investors. One possible explanation for this result is that investors may be less likely to initiate default when a "trigger event" occurs, like a loss of employment, because investors could use the investment property as a source of income to help cover expenses. A similar trigger event may lead to foreclosure for second homeowners given that they already have a primary residence and the non-monetary benefits from owning the second home may become less important under financial hardship. Another possible explanation for higher FICO scores for second homeowners is that it takes more financial resources to purchase an additional home primarily for enjoyment purposes. As a result, a stronger financial position would translate into a higher FICO score.

With respect to the loan-to-value ratio and debt-to-income ratio, homeowners, regardless of ownership status, will place a higher value on the foreclosure option if they hold less equity in their home or hold more overall

Figure 6 Distribution Across States for Loan-to-Value Ratios for Owner Occupant and Non-Owner Occupant Mortgage Borrowers, by Year of Origination (LPS)



Notes: Loan-to-value ratios here are computed as the original principal of the mortgage divided by the appraised value of the property. Loans that have a loan-to-value ratio that exceeds 400 are dropped from the sample.

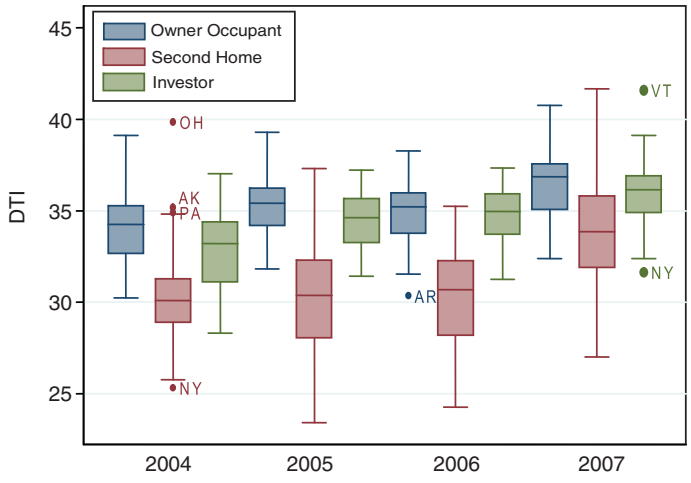
debt.[19,20] Figures 6 and 7 show that occupant owners on average have higher loan-to-value and debt-to-income ratios when compared to non-owner occupants. However, based on median score, the loan-to-value ratios do not exhibit that homeowners associated with any group were reaching in order to purchase a home.[21] Within the non-owner occupant group, investors consistently have

[19] Data for loan-to-value are derived at the time the loan is originated, but this value may have changed if the servicer has performed a post-origination appraisal on the property. As a result, an unknown percentage of the mortgages in the sample may have post-origination loan-to-value numbers.

[20] Von Furstenberg (1969) and Campbell and Dietrich (1983) find evidence that initial loan-to-value ratios alone are significant predictors of default.

[21] It is important to note that it is not possible to make a definitive statement about the financial capacity of borrowers without knowing additional financial information. For example, a homeowner could have a mortgage that includes a relatively high interest rate, yet still have a relatively low debt-to-income or loan-to-value ratio. In other words, the interest expense on outstanding debts could be an important factor in assessing financial capacity, but this information is not part of the calculation used to determine these numbers.

Figure 7 Distribution Across States for Debt-to-Income Ratios of Owner Occupant and Non-Owner Occupant Mortgage Borrowers, by Year of Origination (LPS)

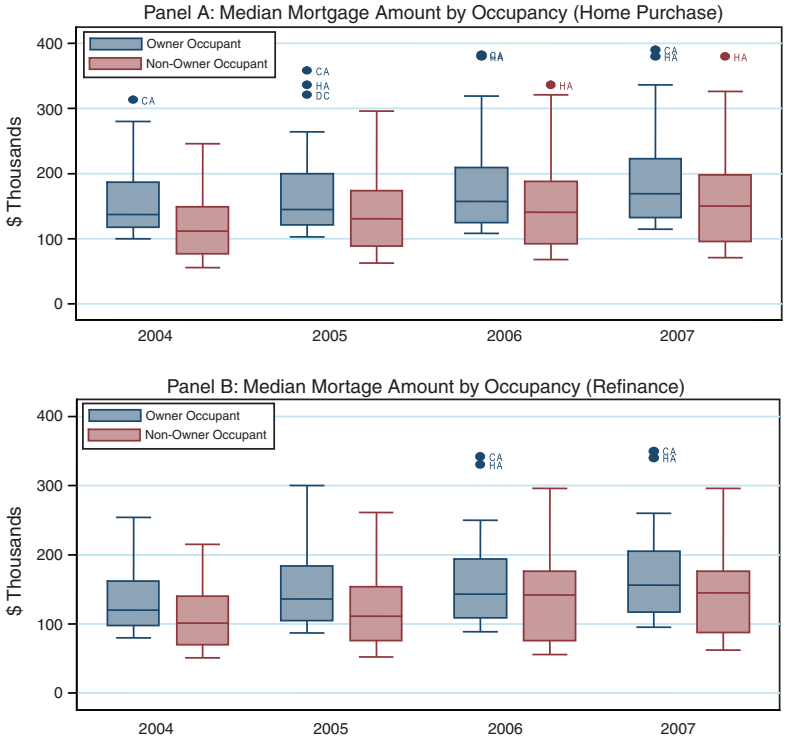


Notes: Loans that have a loan-to-value ratio that exceeds 400 are dropped from the sample.

a higher risk profile when compared to second homeowners. This result is surprising given that investors have higher risk characteristics and lower FICO scores when compared to second homeowners. As stated earlier, it is possible that underwriters view the potential income from an investment property as a mitigating risk factor in the underwriting decision.

In summary, the data for Figures 4–7 show that non-owner occupants have higher median incomes, higher FICO scores, and lower debt-to-income and loan-to-value ratios when compared to owner occupants. These measures are all consistent with non-owner occupants being held to a higher underwriting standard. Given the lower risk profile, it is possible that non-owner occupants would be able to access larger amounts of mortgage credit. However, lenders may restrict the size of loans that non-owner occupants can receive in an attempt to reduce their exposure to default. In Figure 8, I use HMDA data to compare the mortgage amount at the time of origination between owner and non-owner occupants. The data show that the median mortgage amount for non-owner occupants is smaller. In short, this result is consistent with our earlier findings that lenders use higher underwriting standards for non-owner occupants to help mitigate the increased probability of default associated with the higher value of the default option. It is interesting to note that just prior

Figure 8 Distribution Across States for the Median Loan Amount for Owner Occupants and Non-Owner Occupants, by Loan Purpose and Year of Origination (HMDA)



Notes: The data are median mortgage amounts for each state and the District of Columbia, segregated by occupancy. Each box covers the 25th to 75th percentile; the line in the box is the median.

to the housing crisis, a number of the risk measures mentioned above were remaining steady or declining.

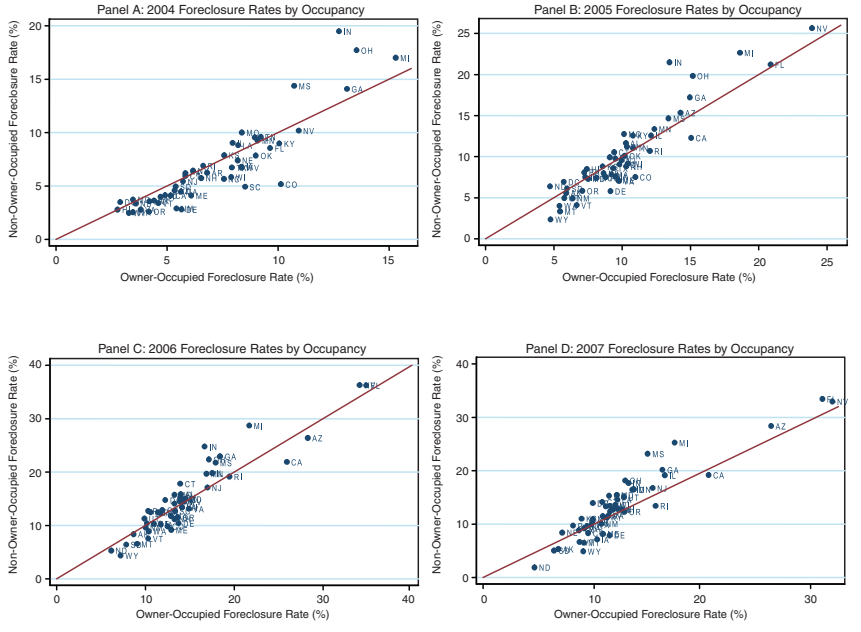
Foreclosures

As discussed above, I believe that non-owner occupants have a stronger financial incentive to exercise their foreclosure option when compared to owner occupants. However, it is difficult to predict if the foreclosure rate for non-owner occupants will be higher given that this group has stronger financial characteristics. It is possible to observe differences in foreclosure patterns

between owner and non-owner occupants using LPS data. In this study, a mortgage is considered in foreclosure if the mortgage defaults following origination. For example, mortgages originated in 2004 to non-owner occupants experience a foreclosure rate of 6.9 percent, which is slightly lower than the 7.5 percent foreclosure rate for owner occupants for the same origination year. As discussed earlier in the article, it would be expected that foreclosure rates for non-owner occupants would rise faster than for owner occupants as economic conditions deteriorate, causing the potential financial benefit from homeownership to decline. As expected, as the housing crisis started to unfold, foreclosure rates for both groups started to rise, but foreclosure rates grew faster for non-owner occupants. For example, in 2005, foreclosure rates for non-owner occupants exceeded those of owner occupants and remained higher throughout the sample period. For the years 2005–2007, foreclosure rates for non-owner occupants were 12.8 percent, 20.0 percent, and 17.4 percent, respectively. During the same years, the foreclosure rates for owner occupants were 12.3 percent, 18.7 percent, and 15.1 percent, respectively.

While the data show that foreclosure rates for non-owner occupants grew faster during the housing crisis, there has been little discussion regarding differences in housing market performance and ownership status at the state level. In an attempt to explore this relationship, Figure 9 plots the relative foreclosure rates for owner occupied and non-owner occupied mortgages generated by year of origination by state. The 45-degree line represents equality, where foreclosure rates for both owner occupants and non-owner occupants are the same. Consistent with the results presented above for the United States as a whole, most states lie near the 45-degree line, but there is a movement above the 45-degree line over time. In other words, for loans originated in 2004, more states experience higher foreclosure rates among mortgages originated to owner occupants. However, this relationship starts to change in 2005 as more states experience higher foreclosure rates among non-owner occupants. A few states that have not received much attention in the press experience relatively high foreclosure rates for non-owner occupants. Specifically, the symbols for Michigan, Indiana, and Ohio are well above the 45-degree line, which means that in these states non-owner occupants are distinctly more likely to be in foreclosure. The symbols for some of the Sunbelt states like California, Florida, and Nevada, which have been identified in the press for having high foreclosure rates, are shown to be near or below the 45-degree line in most years. In other words, foreclosure rates among owner and non-owner occupants are relatively the same in these states. Given that Florida and Nevada are destination states for vacation homeowners, it was somewhat surprising that the relative foreclosure rates for non-owner occupants were not higher.

Figure 9 A Cross-State Comparison of Foreclosure Rates on Non-Owner-Occupied and Owner-Occupied Mortgages, by Year or Origination



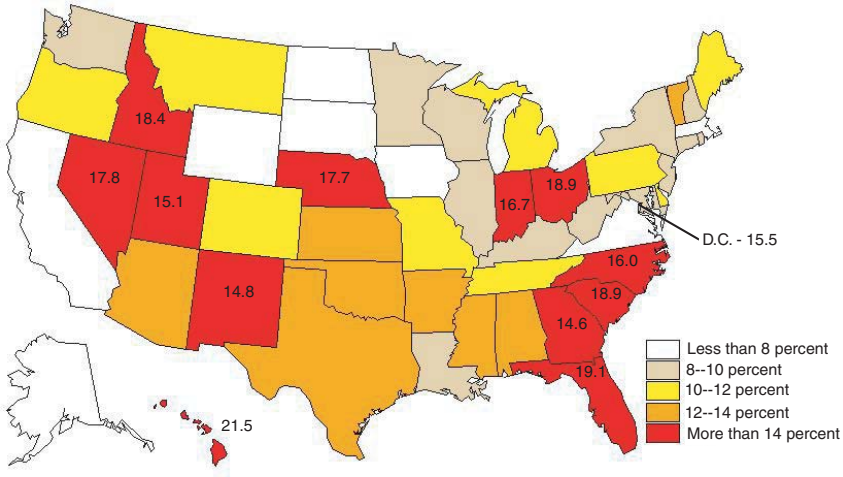
Notes: Home purchase and refinance originations from LPS.

The Spatial Pattern of Foreclosures

As noted earlier, foreclosure rates were trending higher for non-owner occupants nationally and at the state level prior to the housing crisis. However, the role non-owner occupants played in the housing crisis cannot be observed by simply studying foreclosure rates, for doing so would imply that the share of loans originated to owner occupants and non-owner occupants were the same. As a result, it is necessary to recognize that the share of mortgages originated to non-owner occupants varies across states and that this variation may play a role in determining the impact non-owner occupants had in the housing crisis.[22]

[22] Doms, Furlong, and Krainer (2007) find a strong relationship between the share of mortgages originated to investors and delinquency rates among subprime borrowers.

Figure 10 Share of Foreclosure that Involves Non-Owner-Occupied Properties (LPS Data for Mortgages Originated in 2006)



Cartographer: Michael Grover and Eli Popuch, February 2010.

Source: Breck Robinson, FRB Richmond, ESRI.

Figure 10 uses LPS data for mortgages originated in 2006 to show that the share of foreclosures varies significantly across states. For example, the share of foreclosures attributed to non-owner occupants in California is 7 percent. However, the share of foreclosures in Florida is 19 percent.

While the share of foreclosures among non-owner occupants is greater than the national average for a number of states, it would be inaccurate to characterize the role non-owner occupants played in the housing crisis in these states as problematic. For example, in states with relatively few foreclosures overall, the incidence of foreclosures on non-owner-occupied properties could be low in an absolute sense and yet account for a high share of the state's few foreclosures. Conversely, in states with many foreclosures, non-owner-occupied properties could account for a relatively low share of overall foreclosures and yet be much more common when compared to a state that has few foreclosures. This is not just a hypothetical issue. For example, in Figure

10 the share of foreclosures among non-owner occupants was roughly equal in Alabama and Arizona at 12 percent. However, foreclosure rates on mortgages originated in 2006 to owner occupants were about two-and-a-half times higher in Arizona as in Alabama. As a result, using the share of foreclosures among non-owner occupants to measure impact will understate the role non-owner occupants played in the housing crisis in Arizona and overstate their role in Alabama.

In response to the shortcomings discussed above when using a measure like the share of foreclosures to observe impact, a more comprehensive measure is needed that incorporates both the prevalence and performance of non-owner occupant mortgages. In order to observe the impact of foreclosures by non-owner occupants, impact is broken down into two components: prevalence and performance. I define the prevalence measure as the number of non-owner occupant mortgages divided by the total number of housing units by year of origination.[23] I could have used an alternative measure of prevalence, where the denominator is the total number of first lien home purchases plus refinanced mortgages in the same calendar year. Results in this "per mortgage" measure of prevalence for non-owner occupant mortgages are qualitatively similar to the "per housing unit" results. In the analysis, I use the "per housing unit" measure because it is not sensitive to year-to-year fluctuations associated with mortgage lending activity, as noted by Mayer and Pence (2008). The other component to the impact measure is performance. I define performance as the number of foreclosures on non-owner occupant mortgages divided by the total number of non-owner occupant mortgages by year of origination. The product of these two measures represents the number of foreclosures by non-owner occupant mortgages divided by the total number of housing units:

$$Impact = Prevalence \times Performance.$$

Using LPS data for home purchases and refinances, Table 1 provides information on prevalence and performance for mortgages originated for each year between 2004–2007. In 2004, for example, there are 472 mortgages originated to non-owner occupants for every 100,000 housing units in the United States. Of the mortgages originated to non-owner occupants in 2004, 6.9 percent were foreclosed or in foreclosure by July 2011. Taken together, the impact from non-owner occupant mortgages originated in 2004 implies that there were about 33 foreclosures on mortgages originated to non-owner occupants for every 100,000 housing units.

[23] Total housing units is defined as first liens on home purchase loans, including refinancings on single-family homes, excluding home improvement loans. The data on state housing units come from the American Community Surveys for the time period 2004–2007.

Table 1 Prevalence, Performance, and Foreclosure Impact of Non-Owner Occupant Mortgages in our LPS Data, 2004–2007

Year of Mortgage Origination	Performance	Prevalence	Impact
2004	6.9	472	32.6
2005	12.8	616	78.8
2006	20.0	558	94.2
2007	17.4	437	76.0
2004–2007	14.3	521	74.5

Notes: "Performance" refers to the percent of non-owner occupant mortgages foreclosed; "prevalence" refers to the number of non-owner occupant mortgages per 100,000 housing units; "impact" refers to the number of non-owner occupant mortgage foreclosures per 100,000 housing units.

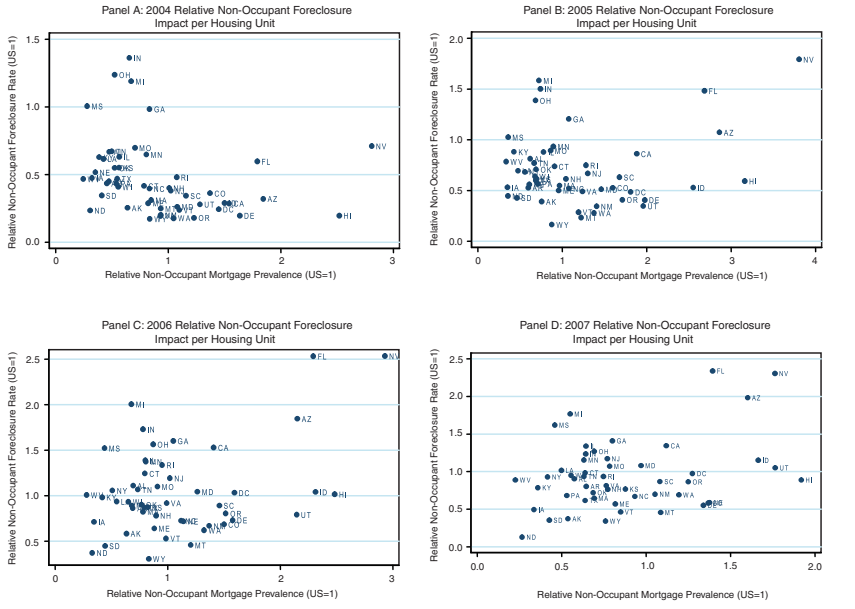
Compared with 2004, the impact of foreclosures on non-owner occupants increased for loans originated in 2005 and 2006. This is partly due to the increased prevalence of non-owner-occupied mortgages (616 and 558 per 100,000 housing units, respectively) during this time period. In addition, the performance of mortgages to non-owner occupants declined sharply from 2004 to 2005 and 2005 to 2006. For example, the foreclosure rate increased roughly by 14 percentage points between 2004 and 2007. As a result, our overall measure of impact (non-owner occupant foreclosures per 100,000 housing units) rose to 78.8 in 2005 and then to 94.2 in 2006. The average number of foreclosures for the time period 2004–2007 is 74.5 foreclosures per 100,000 housing units.[24] The impact measure for non-owner occupant mortgages originated in 2007 is 76.0 per 100,000 housing units, which is slightly above the 2004–2007 national average. The lower number in 2007 is partly due to the start of the housing crisis, which reduced the prevalence of non-owner-occupied mortgages from 558 to 437 per 100,000 housing units.[25] Table 1 provides an overview of the impact of non-owner occupant foreclosures in 2004–2007.

Figure 11 shows how the prevalence, performance, and impact of non-occupant foreclosures varied across the United States for the years 2004–2007. In this figure, prevalence, performance, and impact are measured relative to national norms. This means that the point 1.0 on the horizontal axis stands for a level of prevalence equal to the 2004–2007 U.S. average for prevalence. Similarly, the point 1.0 on the vertical axis stands for a performance level equal to the 2004–2007 U.S. average for performance. The highest point on

[24] The full impact of non-owner-occupied mortgages may be higher than the numbers reported in this study, because the LPS data do not cover the entire mortgage market and may underestimate the share of mortgages originated to non-owner occupants.

[25] Another factor is that loans originated in 2007 had less time to enter foreclosure when compared to loans originated in earlier years.

Figure 11 The Relative Impact (per Housing Unit) of Non-Owner Occupant Foreclosures for Mortgages Originated, by State

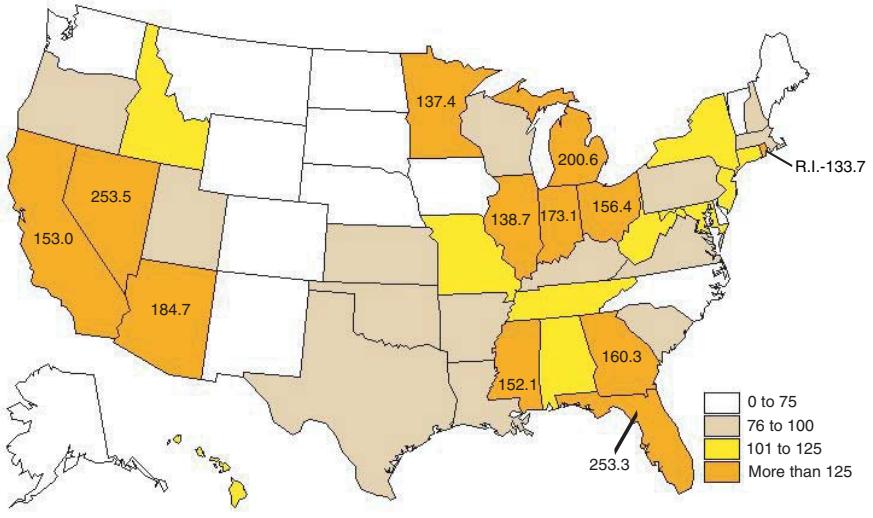


Notes: The middle line represents an impact factor that is equal to the LPS data 2004–2007 national average of 37.6 non-owner occupant foreclosures per 100,000 housing units. The lower and upper lines represent impact factors of half and three times the national average.

the vertical axis in Figure 11, Panel A is labeled IN for Indiana, and it has an x-axis value of about 0.64. This means that Indiana's prevalence measure in 2004 is about 0.64 times the corresponding prevalence measure for non-owner occupant mortgages for the United States over the period 2004–2007. On the y axis, the value for Indiana is about 1.4. This means that Indiana has a foreclosure rate for non-owner-occupied mortgages that is almost 1.4 times higher than the corresponding 2004–2007 U.S. average. The product of these two factors for Indiana is about .90. In other words, the degree of relative impact from foreclosures on non-occupants in Indiana was 10 percent lower than the corresponding national average.

Figure 11, Panel A also tells us something about why foreclosures on non-occupant mortgages originated in 2004 are relatively important in each state. Note that Indiana experienced an above-average impact from foreclosures on non-owner occupants because of performance issues. On the other extreme, Nevada experienced a relatively low foreclosure rate on mortgages to

Figure 12 Non-Owner-Occupied Mortgage Prevalence per Housing Unit, Relative to 2004–2007 U.S. National Average (LPS Data for Mortgages Originated in 2006)



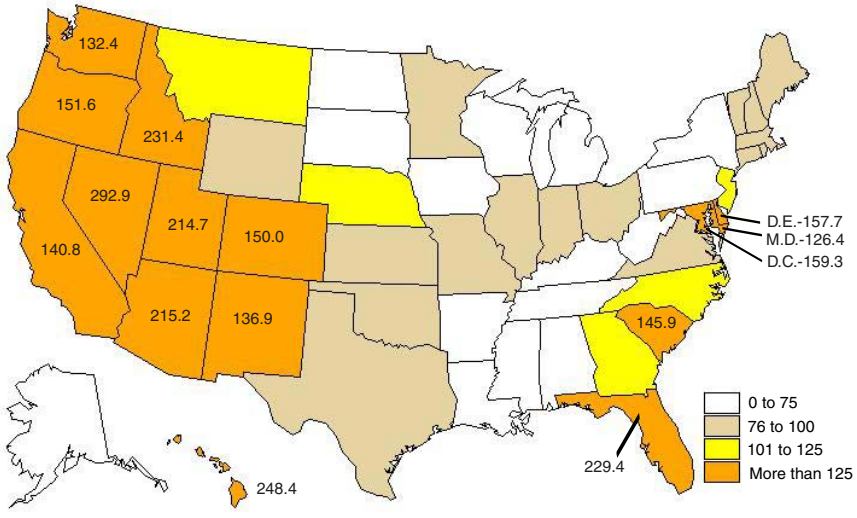
Cartographer: Michael Grover and Eli Popuch, February 2010.

Source: Breck Robinson, FRB Richmond, ESRI.

non-owner occupants, but had an above-average impact because mortgages to non-owner occupants were prevalent.

Figure 11, Panels B, C, and D present the same analysis but for mortgages originated to non-owner occupants for the years 2005, 2006, and 2007, respectively. From 2004–2005, the distribution of impact measures shift toward the Northeast, as the prevalence of non-owner occupant mortgages increases. At the same time, the average performance of mortgages in the sample started to deteriorate. In three states—Nevada, Florida, and Arizona—the impact of foreclosures to non-owner occupants reached or exceeded three times the 2004–2007 national average in 2005. This was driven by high prevalence in Arizona and a combination of high prevalence and poor performance in Nevada and Florida. For a cluster of Midwestern states (Indiana, Michigan, and Ohio),

Figure 13 Non-Owner-Occupied Mortgage Foreclosure Rate Relative to the 2004–2007 U.S. National Average (LPS Data for Mortgages in 2006)



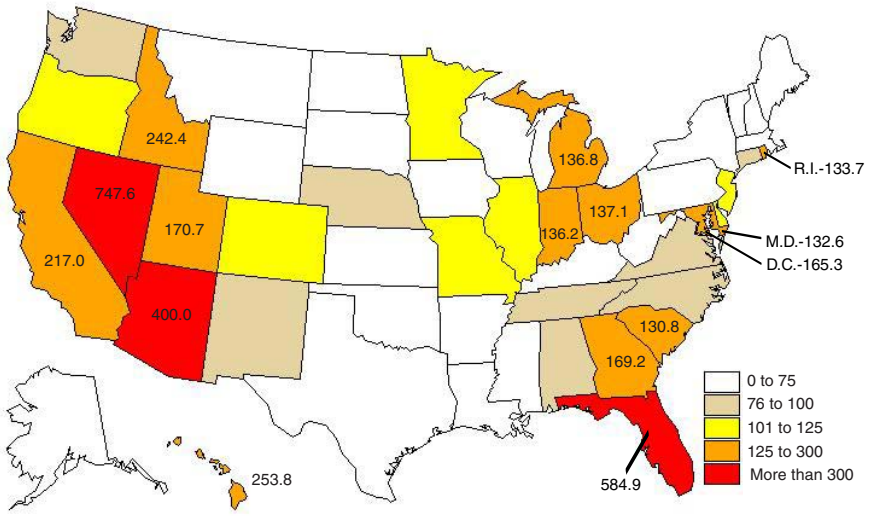
Cartographer: Michael Grover and Eli Popuch, February 2010.

Source: Breck Robinson, FRB Richmond, ESRI.

the foreclosure impact for 2005 reached or exceeded the 2004–2007 national average, even though mortgages to non-owner occupants were not especially prevalent. However, these states had above-average impact measures due to below-average performance of mortgages to non-owner occupants.

In 2006, both performance and prevalence of mortgages to non-owner occupants declined. Visually, this result is observable as a shift toward the Northwest in the distribution of impact measures. Several Midwestern states continued to experience very poor performance combined with relatively low prevalence. Deteriorating performance combined with high prevalence kept the impact numbers very high in Nevada, Florida, and Arizona. In the case of Hawaii, Idaho, Delaware, and Utah, high impact outcomes were driven by

Figure 14 Non-Owner-Occupied Mortgage Foreclosure Impact per Housing Unit, Relative to 2004–2007 U.S. National Average (LPS Data for Mortgages Originated in 2006)



Cartographer: Michael Grover and Eli Popuch, February 2010.

Source: Breck Robinson, FRB Richmond, ESRI.

high prevalence, while poor performance was a problem in states like Indiana, Michigan, and Ohio.

In most states, a combination of lower prevalence and better performance reduced the impact measures for mortgages originated in 2007. The reduction in impact measures is observable as a shift toward the Southwest in the distribution of impact ratios in Figure 11, Panel D. However, the impact measures for Arizona, Florida, and Nevada are still quite high when compared to the national average for the time period 2004–2007.

To provide a clearer view of the geographic patterns in foreclosure to non-owner occupants and its underlying factors, Figures 12, 13, and 14 use maps to show the prevalence, performance, and impact for mortgages originated in 2006 for all 50 states and the District of Columbia. Figure 13 shows that in

2006, non-owner occupant mortgages were relatively prevalent in the West (including Hawaii) and along the mid- to lower-East Coast states from Florida to New Jersey. Among the states that were identified as having a high prevalence of non-owner-occupied mortgages, only Arizona, California, Florida, Georgia, Maryland, Nevada, and New Jersey also experienced poor performance. In addition to these states, a number of states in the Midwest and parts of the Northeast experienced high foreclosure rates. In Figure 14, the impact ratios for Arizona, Florida, and Nevada are 400 percent, 585 percent, and 748 percent, respectively, above the national average. There are a number of states that have been highlighted in the press for having high foreclosure rates in general, like California, Georgia, Maryland, and parts of the Midwest. It is interesting to note that these same states were experiencing high impact ratios for non-owner occupant mortgages in 2006. Our map also shows that Idaho, South Carolina, and Utah were experiencing an above-average impact from foreclosures on mortgages to non-owner occupants. This result is surprising given that the press has not labeled any of these states as foreclosure hotspots.

4. CONCLUSION

During the housing crisis, it was unknown if mortgages to non-owner occupants helped exacerbate the housing crisis. It has been discussed that non-owner occupants are sensitive to changes in home prices because they are more likely to view homeownership as a financial asset, causing non-owner occupants to increase their demand for housing in areas where housing prices have increased or are expected to increase. As a result, non-owner occupants are more likely to exercise their option to default when compared to owner occupants. Subsequently, it would be expected that lenders would hold non-owner occupants to a higher underwriting standard in order to reduce their probability of default. The results show that non-owner occupants have higher incomes, higher credit scores, smaller loans, and generally a lower overall risk profile. If markets are operating correctly, higher underwriting standards for non-owner occupants should result in similar foreclosure rates relative to owner occupants, but differences in foreclosure rates should widen during an economic downturn when the financial benefits from homeownership decline. I observe this pattern in foreclosure rates when using national data.

In an attempt to observe the impact of foreclosures at the state level, an impact measure is decomposed to show the prevalence and performance of non-occupant mortgages. States that experienced the highest impact from foreclosures on properties owned by non-owner occupants (Arizona, Florida, and Nevada) exhibit both relatively poor performance and relatively high prevalence. However, a couple of states experienced an impact ratio that exceeded the national average mainly due to poor performance (i.e., Indiana, Michigan, and Ohio, and some other Midwestern and Northeastern states). By

contrast, Idaho and some other Western states had a high prevalence for mortgages originated to non-owner occupants, leading to a relatively high impact measure.

The housing crisis and the subsequent hardships faced by homeowners have been well chronicled in the press. All across the United States, homeowners have experienced declining home prices and high rates of foreclosure. This has led policymakers to initiate programs to stabilize home values by reducing foreclosures. However, policymakers have given little attention to the plight of non-owner occupants, even though the prevalence and performance of mortgages originated to this group has helped exacerbate high foreclosure rates in many states. The inability of previous programs to address the needs of all homeowners may have been a contributing factor regarding the size of the decline and the length of the housing crisis.

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