The Post-Foreclosure Experience of U.S. Households

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Abstract

Despite the recent flood of foreclosures on residential mortgages, little is known about what happens to borrowers and their households after their mortgage has been foreclosed. We study the post-foreclosure experience of U.S. households using a unique dataset based on the credit reports of a large panel of individuals to from 1999 to 2010. Although foreclosure considerably raises the probability of moving, the majority of post-foreclosure migrants do not end up in substantially less desirable neighborhoods or more crowded living conditions. These results suggest that, on average, foreclosure does not impose an economic burden large enough to severely reduce housing consumption.

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Introduction

With foreclosures on residential mortgages soaring to historic highs, information about the post-foreclosure experience of borrowers is crucial to our understanding of how the current housing downturn has affected the economy. In particular, where these households move and how they change their subsequent housing consumption can affect many housing market outcomes including vacancy rates, homeownership rates, and house prices. For example, if post-foreclosure households tend to rent their subsequent housing, the flood of foreclosures could signal a substantial increase in the demand for rental units. Since rental and owner-occupied housing units tend to be different types of structures in the US, this shift in demand could alter the type of residential structures in the economy. Beyond their impact on housing markets, foreclosures can influence personal finance, family structure, employment opportunities, the quality of available schooling, and many other dimensions of an individual's economic and social welfare.

The existing literature on foreclosure focuses on issues related to mortgage and housing markets.[2] To date, we have limited knowledge of the post-foreclosure experience of former borrowers beyond anecdotal evidence because most datasets are not suited to examine this issue. Loan-level data such as the CoreLogic and Lender Processing Services do not collect any information after the loan is terminated. Available panel studies of individuals and households usually do not report data on foreclosures, and are frequently too small to study detailed

[2] Recent studies include Pence (2006) and Ghent and Kudlyak (2010) on state foreclosure laws; Foote, Gerardi and Willen (2008) on the causes of mortgage default; Adelino, Gerardi and Willen (2009) and Haughwout, Okah and Tracy (2009) on mortgage renegotiation and modification; and Immergluck and Smith (2005), Campbell, Giglio and Pathak (2009) and Harding, Rosenblatt and Yao (2009) on the effects of foreclosure on property values.

questions about migration adequately.[3] These samples are also released with long time lags, making it difficult to study a phenomenon as recent as the current foreclosure wave.

Recently, a few researchers have begun to collect local data to study post-foreclosure outcomes. For example, Been et al. (2010) and Nelson et al. (2011) use case studies to evaluate the effect of foreclosure on children's schooling outcomes. To our best knowledge, Brevoort and Cooper (2010) provide the only study using a large nationally representative sample to examine the consequences of foreclosure. They examine the effect of foreclosure on credit scores. We use the same dataset to investigate various aspects of post-foreclosure housing consumption, including household size, homeownership, structure type, and neighborhood choice.

Although our goal is primarily descriptive, it is helpful to consider what would have happened to borrowers had they not experienced a foreclosure. To this end, we construct a comparison group composed of individuals that have similar initial characteristics as post-foreclosure borrowers but that that did not experience a foreclosure. Specifically, we match individuals that experience a foreclosure to other homeowners of a similar age that have a similar initial credit score and mortgage balance, and initially lived in the same Census tract, ZIP code, or county.

We begin by studying the probability of moving after a "foreclosure start," the time when a loan enters the foreclosure processes. We find that foreclosure starts significantly increase the probability of moving for the subsequent two years. Nevertheless, about half of individuals have not moved even two years after the foreclosure start, suggesting that the foreclosure process is frequently never completed. Consistent with this interpretation, foreclosure starts in judicial states (where the foreclosure process must go through the court) or in areas with rapid house

[3] The Panel Study of Income Dynamics added a question to their 2009 survey about whether the lender has started the foreclosure process, but only 39 households answered "yes" to this question and it will be years before the complete post-foreclosure experience can be analyzed with this dataset.

price appreciation (where delinquent loans can more easily be refinanced) are less likely to result in migration. Because it can take up to two years for a foreclosure start to result in migration, the remainder of our analysis compares the household experience in the year prior to the start to the second year afterward.

Our first measure of the household experience is household size and composition. Average household size does not increase noticeably after a foreclosure, nor does it change much for the comparison group. Post-foreclosure individuals are more likely than the comparison group to experience changes in household composition, but this result is because post-foreclosure borrowers are more likely to move and migration is frequently correlated with changes in household composition. Only a small fraction of post-foreclosure individuals seem to move in with their parents. In short, we find little evidence that many people end up living in larger households in order to defray living expenses.

We then investigate the tenure of post-foreclosure individuals and the type of structure in which they live. Not surprisingly, former borrowers are much less likely to have a mortgage two years after the foreclosure start. Those without a mortgage are very likely to be renters since most do not appear to move in with other existing households that might own their home with no mortgage. Although the switch from owner-occupancy to renting does raise the probability that a post-foreclosure borrower will live in a multifamily structure, the majority of these individuals still live in single-family housing units.

To examine where post-foreclosure individuals move, we look at migration distance and neighborhood characteristics measured by block and block group level data from the 2000 Census. About 1/5 of post-foreclosure migrants move a long-enough distance to participate in a different labor market, a slightly smaller fraction than the comparison group. Thus, post-

foreclosure migrants may choose a new location that allows them to stay in the same local job market. We find no evidence that post-foreclosure migrants are more likely to remain in the same school district or Census tract, so maintaining ties to a local school seems not to be important in the relocation decision.

As for the neighborhood characteristics, post-foreclosure individuals are more likely to move to denser areas with a lower homeownership rate. Their new neighborhoods also tend to have a higher fraction of female-headed households, smaller houses, a shorter average commute time, and lower income, although the magnitude of these differences is very small. By contrast, we find little difference between the post-foreclosure and comparison groups in other measures of neighborhood affluence including educational attainment, racial and ethnic composition, house value, or rent. Taken together, the evidence suggests that post-foreclosure individuals move to rental units in denser urban areas, but the new neighborhoods do not seem to be much less desirable.

In summary, the majority of post-foreclosure migrants do not end up in substantially less-desirable neighborhoods or more crowded living conditions. Since housing unit quality is highly correlated with neighborhood quality, they are not likely to live in considerably lower quality homes than they did before. These results suggest that, on average, foreclosure does not impose an economic burden large enough to severely reduce housing consumption.

Theoretical Framework

To understand the effects of foreclosure on household outcomes, it is helpful to consider two related questions. First, what are the factors that lead to foreclosure and do these factors have any persistent effects on household decisions? Second, does the foreclosure itself affect

household behavior independently of any shocks that may have caused the household to default on their mortgage?

The first question can be addressed in the context of a model of mortgage default. When borrowers have positive home equity, default and foreclosure should not happen in theory because borrowers can sell their home or refinance their mortgage.[4] Thus, studies on mortgage default decisions have largely focused on borrowers with little or negative home equity. The canonical default model popularized by Kau, Keenan, and Kim (1994) treats the mortgage contract as a put option and shows that a borrower will default when the home value falls sufficiently below the amount of the mortgage. As pointed out by Vandell (1995), however, such option-theoretic models ignore the transaction costs associated with default as well as adverse shocks that may cause borrowers with non-positive equity to become insolvent and induce default.

Empirical studies that incorporate default costs and adverse shocks typically find that they are much more important than house prices alone in driving the default decisions of borrowers with negative equity (Bhutta et al. 2010, Foote et al. 2008). For example, borrowers are more likely to default on their mortgage if they have a highly volatile income stream (Vandell and Thibodeau 1985) or when their local property tax becomes due (Anderson and Dokko 2011). We are not aware of any studies that have explicitly investigated the roles of adverse life events, such as divorce or illness, in foreclosure.[5] A few papers have found a

[4] In practice, we do observe default and foreclosures among borrowers with substantial home equity. These defaults are likely due to idiosyncratic circumstances, such as illness or divorce.

[5] A few papers provide indirect evidence using aggregate or state-level data. Elmer and Seelig (1998) find no relationship between the aggregate foreclosure rate and divorce rate using annual data from 1959 to 1997. Foster and Van Order (1984) also find no relationship between the aggregate divorce rate and default rates on FHA mortgages from 1960 to 1979. Foster and Van Order (1985) find that states with higher divorce rates have higher mortgage default rates, whereas Clauretie (1987) finds no such relationship.

positive correlation between personal bankruptcy and divorce or illness (Fay, Hurst and White, 2002, Fisher and Lyons, 2006, Himmelstein et al. 2005).

If the negative shocks that precipitate mortgage default have a permanent effect on household income, the post-foreclosure experience of a household could reflect these adverse factors. In a very simple model where the consumer has preferences with a constant elasticity of substitution, a permanent reduction in income should cause expenditures on all forms of consumption to fall. One way to reduce expenditures on housing services would be to consume a smaller quantity of housing. This reduction could manifest, for example, in migration to a smaller, lower-quality residence or a less-desirable neighborhood with fewer amenities. Another way for a post-foreclosure borrower to reduce his or her quantity of housing consumed would be to move in with other income-earning adults. An example of this choice, popularized by anecdotes in the media, is that the former borrower might move in with friends or family members who already own their home.[6]

Of course, a reduction in expenditures on housing could be achieved without reducing the quantity or quality consumed if the quality-adjusted price of housing falls. To be clear, the price that matters in this context is not the price of purchasing a home (which is an asset price) but the price of a unit of housing services—i.e. the rental price. According to the Consumer Price Index, average rent paid by tenants in the US did not fall at any point from 2000 to 2010. Therefore, it seems unlikely that households desiring to reduce expenditures on housing could have done so without sacrificing quantity or quality. Migration from a high-rent to low-rent area would not count as a reduction in the price of housing services, since geographic differences in rents probably reflect quality differences rather than pure price differences.

[6] For example, Luo (2010) describes three generations of one family living in the same house after job losses and foreclosure.

The second question regarding foreclosure addresses its causal impact and can best be considered in the context of credit constraints. A foreclosure remains on an individual's credit report for seven years, and lenders likely view this event as raising the probability that the individual will default on future loans. Thus, the foreclosure can reduce access to credit. Deaton (1992) shows that credit-constrained households consume less when credit constraints bind. Even when the constraint does not bind in a given time period, Hayashi (1987) shows that the prospect of a binding credit constraint in the future will reduce household consumption relative to an environment without credit constraints. Thus, by restricting access to credit, foreclosure can reduce household consumption even absent a negative income shock. As in the case of a negative income shock, this reduction in housing consumption could manifest in moving to a lower-quality house, a less-desirable neighborhood, or to consuming less housing per adult.

In summary, both frameworks suggest that former borrowers should spend less on housing after a foreclosure. Credit constraints imply that foreclosure will directly cause a reduction in housing consumption, while the negative shocks that lead to foreclosure might also reduce housing consumption if they persist. In the empirical analysis that follows we will not be able to distinguish between the direct effects of foreclosure and the indirect effects of adverse factors that cause foreclosure. However, since both frameworks predict a reduction in housing expenditures, we will frame the post-foreclosure outcomes that we examine in the context of housing consumption.

Data Description

The analysis in this study is based on credit report data from the FRBNY/Equifax Consumer Credit Panel. The panel comprises a nationally representative 5 percent random

sample of US individuals with credit files, and all of the household members of those 5 percent. In all, the data set includes files on more than 15 percent of the adult population (aged 18 or older), or approximately 37 million individuals in each quarter from 1999 to the present. The underlying sampling approach ensures that the panel is dynamically updated in each quarter to reflect new entries into and exits out of the credit markets, with young individuals and immigrants entering the sample and deceased individuals and emigrants leaving the sample at the same rate as in the population of individuals with credit files. In each quarter, the records of all other household members who shared a primary individual's mailing address were also included. Even though all individuals included in the database are anonymous, the panel allows one to track individuals and households consistently over time. In addition to the computation of nationally representative estimates of individual and household level debt and credit in each quarter, the panel therefore permits a rich analysis of the dynamics of consumer debt and related policy issues at both the individual and household levels.

Since the FRBNY/Equifax Consumer Credit Panel data are collected at the borrower level, they offer a more comprehensive perspective on mortgage debt than is available in standard loan-level datasets. In addition to detailed data on all debts secured by residential real estate, the panel includes information on individuals' and households' other loans, such as credit cards, auto loans and student loans. More general information available in the panel include the residential location of the borrower at the census block level, the individual's year of birth, the individual's credit experience such as foreclosure, bankruptcy and collection, as well as a

consumer credit score that is comparable to the well known FICO score.[7] More details regarding the sample design and data content can be found in Lee and van der Klaauw (2010).

The credit bureau data are uniquely suited to studying the post-foreclosure experience of households because of the detailed information on mortgage loan history and because the panel follows individuals rather than loans. In addition, the large size of the sample and the detailed geographic identifiers allow us to examine residential migration patterns in detail. Another feature of this dataset is that it is updated on a more-timely basis than other large, nationally representative datasets, which is useful for studying the ongoing effects of the current wave of foreclosures. Because the credit bureau dataset is very large and our research questions can be addressed using annual data, we limit our sample to the fourth quarter of each year from 1999 through 2010.

One of the key variables in the credit bureau data that we use in this paper is the foreclosure indicator. This variable indicates a foreclosure start, which is the point at which the lender sends a Notice of Default to a delinquent borrower. We do not observe foreclosure completion, i.e. whether or not the property is sold at a foreclosure auction, in the data. To the extent that the lender and the borrower may work out a deal through refinancing or loan modification, a homeowner might not move after a foreclosure start. Another issue with the foreclosure indicator in the credit bureau data is that it is recorded at the individual level instead of at the loan level. If a borrower owns multiple properties, it is not clear whether the foreclosed property is the one in which they reside. The dataset also does not include an owner-occupancy indicator. A foreclosure is less likely to result in a change in housing consumption if it occurs on an investment property rather than an owner-occupied property. To reduce the likelihood that

[7] Census block is the most detailed geographic unit in the Census data. According to the 2000 Census, there are 5.3 million unique blocks in the US, and the median block has 25 residents and 11 housing units. Our analysis sample contains 1.3 unique blocks, and the median block in our sample has 74 residents and 28 housing units.

the foreclosed property is an investment property, we limit our sample to individuals with only one large mortgage prior to the foreclosure start.[8]

Figure 1 shows the number of new foreclosure starts filed each year in the credit bureau data.[9] The number of foreclosure starts increased notably during the 2001 recession, but the rise in foreclosure starts was much more striking during the 2007-2009 period when house prices dropped precipitously and the unemployment rate approached 10 percent. Because the housing market changed so dramatically during our sample period, in most of our analysis we report statistics separately for cases where the foreclosure start occurs before 2006 and where the foreclosure start occurred in 2006 or later.

Empirical Strategy

Although we are primarily interested in describing the post-foreclosure experience of households, it would be helpful to get a sense of what would have happened to these households had the foreclosure process never been initiated. Individuals who experience a foreclosure are a small fraction of all homeowners with a mortgage, and they tend to be different from the general population of mortgage borrowers along many dimensions. For example, the type of individual that experiences a foreclosure may be more economically vulnerable than the typical borrower, even before the foreclosure occurs. Consequently, comparing post-foreclosure individuals with the typical homeowner may exaggerate the negative effect of a foreclosure. Instead, we

[8] Specifically, we first drop individuals with more than 2 first mortgages prior to the foreclosure start. We also drop individuals with 2 first mortgages prior to the foreclosure start if the smaller mortgage is more than half the size of the larger mortgage. We do not drop all individuals with two mortgages because we do not want to exclude borrowers with junior liens. These restrictions exclude about 12 percent of foreclosed individuals. We do not place any restriction on the number of home equity loans (HELs) or home equity lines of credit (HELOCs) that borrowers may have.

[9] Because the foreclosure flag corresponds to an individual rather than a specific mortgage loan, we observe a different number of foreclosure starts than recorded by loan-level datasets since one individual may have multiple mortgages and one mortgage can also be taken out jointly by multiple individuals.

construct a counterfactual by identifying a group of individuals with similar initial characteristics as individuals who experience a foreclosure.

We construct the comparison group using data from the year prior to when a foreclosure start is initiated. The characteristics that we consider are age (using the categories 18-24, 25-34, 35-44, 45-54, 55-64, 65 and above), credit score (using the categories less than or equal to 400, 401-450, 451-500, 501-550, 551-600, 601-650, 651-700, 701-750, and above 750), structure type (i.e. single-family or multifamily building),[10] and mortgage balance quintile.[11] For each individual who experiences a foreclosure, we search for all individuals in the year prior to foreclosure that live in the same Census tract and have characteristics that fall into the same cell but who never had a foreclosure during the entire sample period. If we cannot match the foreclosure individual to anyone in the same Census tract, we broaden the geographic area to ZIP code. If we still cannot find a suitable match, we broaden the geographic area further to county. Approximately 10 percent of foreclosed individuals are matched at the Census tract level, 20 percent are matched at the ZIP code level, and 45 percent are matched at the county level.[12] The remaining 25 percent of foreclosed individuals do not have matches even at the county level and are excluded from our analysis.

We also implement several data cleaning procedures in our matching algorithm. For example, about 1 percent of foreclosed individuals experienced more than one foreclosure

[10] We determine structure type from the "address type" variable. The FRBNY/Equifax Consumer Credit Panel records address type as "high-rise" if the address contains an apartment number; we designate these cases as multifamily structures. We designate "street address" as single-family structures. We exclude all other address types including P.O box and military residences.

[11] About 10 percent of individuals had no mortgage in the year prior to foreclosure and are excluded from our analysis. The absence of a mortgage could be due to reporting error or the lag between when the foreclosure start was actually filed and when the foreclosure start was reported to the credit bureau.

[12] We exclude matches when a foreclosed individual is matched to more than 500 comparison individuals as these cases likely correspond to very large counties and economic conditions may vary significantly within the county. On average, each individual in the foreclosure group is matched with 2 comparison individuals within the same Census tract or the same ZIP code and 5 comparison individuals in the same county.

between 1999 and 2010. We exclude these individuals because it is difficult to determine which foreclosure might have led to any given outcome. To avoid having one individual serve as the comparison for different post-foreclosure borrowers in different years, we remove a person from the pool of potential matches once he or she is matched to an individual in the foreclosure group. These data cleaning procedures do not change our results substantively, but they help avoid complications in computing certain statistics and standard errors. In addition, because individuals with the same address are regarded as the same household in the credit bureau data, errors in the address data such as missing apartment numbers can cause all individuals in the same multifamily building to be classified as being in the same household. To reduce measurement error in studying household formation, we limit our sample to households with at most 4 adult members at any given time.[13] Following the standard procedure in matching estimation, we weight observations to give equal weight to the foreclosure and comparison groups. For example, if a matched group has two post-foreclosure individuals and 5 comparison individuals, we give each post-foreclosure individual a weight of 1 and each comparison individual a weight of 0.4.

Table 1 reports a number of summary statistics for the foreclosure and comparison groups, which are all measured in the year prior to foreclosure. The average credit score in this sample is around the 10th to 15th percentile in the national distribution, while the median mortgage balance is roughly the same as the median of the national distribution. Thus, although these individuals are pose a much greater credit risk than average, they do no tend to live in more expensive or less expensive housing than the typical person with a credit report. Average household size, at roughly 2¼ adults per household, is slightly larger than the average of 2 adults per household that we calculate for individuals with a mortgage in the 2000 Census or 2007

[13] Results are similar when we change the threshold to 6 adult members per household.

American Community Survey. Average age in our sample is a few years lower than the average age of individuals with a mortgage in these other nationally representative datasets, possibly because the individuals in our sample have lower credit scores and presumably lower income.[14]

The initial characteristics of borrowers who experienced foreclosure during the second part of our sample are somewhat different than those of borrowers who experienced foreclosure earlier in the decade. In general, these differences suggest that foreclosure expanded to a broader segment of the population during the housing market downturn. For example, more borrowers in the later period were current on their mortgage, credit card and/or auto loan in the year prior to foreclosure. The credit scores of the foreclosure group are also higher in the later period, both in absolute terms and relative to the national distribution.

Comparing the initial characteristics of the foreclosure and comparison groups, most are quite similar including age, credit score, fraction living in a single-family structure, and median mortgage balance. This result is not surprising since we formed the comparison group using these variables. Average household size and the fraction of individuals with a credit inquiry in the past 12 months (an indicator of credit demand) are also similar for the two groups.

Despite the similarities, a few measures suggest that the foreclosure group might be somewhat more economically disadvantaged. Individuals in this group are more likely to be delinquent on their mortgages. They are less likely than the comparison group to have credit card accounts or auto loans, and they tend to have smaller credit card and auto loan balances conditional on having a loan. As shown later in the paper, controlling for the initial characteristics that differ across the two groups does not make any noticeable difference to our empirical findings.

[14] We do not observe income in the FRBNY/Equifax Consumer Credit Panel. However, age is correlated with income. In the Census, average age falls from 44 to 43 when limiting the sample to individuals below the 25th percentile of household income. In the 2007 ACS, it falls from 45 to 43 when making this restriction.

Results

As discussed above, we expect foreclosure to result in reduced housing consumption. In the context of the FRBNY/Equifax Consumer Credit Panel, this reduced consumption could manifest in a number of ways including an increase in household size, a move to rental (lower quality) and/or multifamily (smaller) housing, or a move to a lower quality neighborhood. We will examine each of these hypotheses in turn. First, however, we will examine the probability of moving after a foreclosure start to gain insight into which foreclosure starts are completed and how long it takes for foreclosure to affect housing consumption decisions.

Post-Foreclosure Migration

Figure 2 shows the fraction of individuals that live in a different Census block than in the year prior to foreclosure start, which is shown as year -1 on the x axis. For the comparison group, year -1 is the year in which an individual was matched to someone in the foreclosure group. Note that the mobility rates of the foreclosure and comparison groups in years before year -1 are almost identical. Such similarities reassure us that the comparison group provides a reasonable counterfactual for the post-foreclosure individuals.

Twenty-three percent of individuals move within the first year of the foreclosure start (year 0), suggesting that some foreclosures occur fairly quickly.[15] By contrast, only 12 percent of the comparison group had moved within this time frame.[16] Consequently, foreclosure appears to raise the propensity to migrate. The gap between the foreclosure and comparison groups

[15] We do not observe whether post-foreclosure migration is the result of eviction from the property, the result of a short sale, or possibly even the result of a traditional sale.
[16] According to the Current Population Survey, a frequently-used dataset to measure migration, during the 2000 to 2010 period 12 percent of the adult population had changed residences within the past year.

widens in the first and second years after foreclosure, and then stabilizes at about 23 percentage points. In the 3-year period from the year prior to the foreclosure start to the second year afterward, nearly half of the post-foreclosure individuals had moved, compared to only one quarter in the comparison group. Although the cumulative probability of moving continues to rise following the second year after foreclosure, it moves up by about the same amount for the comparison group. Therefore, this increase is likely due to other reasons such as life-cycle events or employment changes, rather than foreclosure. These statistics suggest that most foreclosures are completed within two years after the notice of default, if they are completed at all.

Next, we use regression analysis to examine whether the differential migration propensity between the post-foreclosure and comparison groups are due to foreclosure or to unobserved characteristics of the two groups. Table 2 reports the results of regressing the probability of having moved from the year prior to the foreclosure start to the second year afterward on an indicator for having received a notice of default. Consistent with the figure, individuals who receive a foreclosure start are 23 percentage points more likely to have moved (column 1), a migration rate that is double that of the comparison group. Although this estimate is based on a simple linear probability model, results are similar if we use a probit specification. Controlling for initial age, credit score, mortgage balance, address type, year, and geography does not change this result since we matched the foreclosure and comparison individuals along these dimensions. The estimated migration differential is also similar if we add controls for credit inquiry, credit card and auto loan balances, and delinquency status in the year prior to foreclosure (column 2), even though these characteristics differ between the two groups.

Because the comparison group was formed based on tract, ZIP code or county boundaries and neighborhood characteristics can vary within these areas, we also try controlling for block fixed effects. The difference in migration rates between foreclosure and comparison individuals is larger in locations with at least one foreclosed and comparison individual per block, but controlling for block fixed effects in this sample does not reduce the difference between the two groups (columns 3 and 4).[17]

A number of researchers have found that state foreclosure laws affect the length of the foreclosure timeline (see Crews Cutts and Merrill 2008). Columns 5 and 6 of Table 2 show that the difference in migration between the foreclosure and comparison groups is larger in non-judicial states where the foreclosure process is not required to go through the courts. This result is consistent with the notion that requiring court approval lengthens the foreclosure process, thereby reducing the probability that a foreclosure start will cause a borrower to move within a given time period.

Although entering the foreclosure process clearly raises the probability of migration, about half of post-foreclosure borrowers had not moved within two years after their property had entered the foreclosure process. We interpret this result as showing that many borrowers are able to refinance their loan or find other methods to become current without being evicted or selling the property. Indeed, conversations with industry analysts suggest that only about half of foreclosure starts are completed. A Furman Center report (2010) also finds that only half of foreclosure starts in New York City completed the foreclosure process. Consistent with the

[17] Observations in this subsample where we can control for block fixed effects are mostly from recent years and foreclosure stricken areas. In other words, these observations are more likely to be in periods and locations with large house price declines. As shown later in the paper, house price declines may induce higher mobility rate after foreclosure starts since borrowers can no longer refinance their mortgages or work out alternative deals with their lenders. Therefore, the difference in migration rates between the foreclosure and comparison individuals is larger in columns (3) and (4) than those shown in columns (1) and (2).

notion that the post-foreclosure non-migrants refinanced, the gap in migration rates between the foreclosure and comparison groups is much larger in the 2006-2008 period, when refinancing was likely more difficult due to the housing market contraction (columns 7 and 8). Specifically, post-foreclosure borrowers were 28 percentage points more likely to move two years after the foreclosure start in the later period, compared to 18 percentage points in earlier years.

To investigate further, we examine the interaction between house prices and the effect of foreclosure on the probability of moving. We measure house prices at the ZIP code level using indexes published by CoreLogic. These indexes are monthly repeat sales indexes on single-family houses covering about 6000 ZIP codes. We regress the probability of moving within two years after the foreclosure start on a foreclosure indicator, the cumulative house price appreciation during the two years prior to foreclosure, and the interaction between foreclosure and the house price appreciation measure. The regression also includes state-year fixed effects to control for unobserved differences across locations and over time. Column (1) of Table 3 shows that foreclosed individuals are less likely to move in ZIP codes where house price appreciation is higher, consistent with the hypothesis that mortgages are more likely to be refinanced or modified after entering foreclosure if house prices have been moving up. The magnitude of our estimate suggests that a 10 percentage point increase in house price appreciation during the two years prior to foreclosure reduces the probability of moving by 0.03 percentage points, or 11 percent from the baseline average. In columns (2) and (3), we also use county- and MSA-level house price appreciation as robustness checks and again we find that borrowers living in areas with high house price appreciation are less likely to move after their loan enters foreclosure.

Having established that foreclosure raises the probability of migration for the two years following a notice of default, in the remainder of our analysis we will focus on the 3-year period from the year prior to foreclosure start to the second year afterward. We limit the post-foreclosure sample to individuals who moved during this period because the foreclosure process was likely not completed for borrowers who did not move, and foreclosure is not likely to have a large effect on housing consumption decisions if it is not completed.[18] Except when noted, we include individuals in the comparison group whether they moved or not, since the decision to move and the consequent housing consumption decisions should reflect the economic or life-cycle factors that are common to both the post-foreclosure and comparison individuals.

Household size and composition

One obvious measure of housing consumption is household size; post-foreclosure borrowers might reduce their housing expenditures by moving in with more income-earning adults. However, Table 4 shows that average household size does not change noticeably after a foreclosure, in either absolute magnitude or relative to the comparison group.[19] A greater fraction of post-foreclosure individuals move into larger households, but a greater fraction of them reduce their household size as well. Furthermore, these differences result from including non-movers in the comparison group; migrants in the comparison group tend to increase and decrease their household size to the same extent as post-foreclosure migrants.

Although the number of adults per household does not change in a meaningful way after foreclosure, it is possible that other aspects of household composition are affected. Indeed, in the

[18] We also exclude foreclosure individuals who move after the notice of default but retain the old mortgage since this may indicate that the borrower is an investor or the foreclosure is not completed.

[19] In results not shown, changes in household size for the two groups are similar when comparing households with the same initial household size. Households with a single adult tend to become larger, while households with 3 or 4 adults tend to shrink, likely due to mean reversion.

later period only 17 percent of the post-foreclosure individuals live with the same household members, compared with 46 percent in the comparison group. Even conditional on having the same number of household members as three years earlier, less than half of the post-foreclosure individuals live with the exact same people. By contrast, 85 percent of individuals in the comparison group who maintained the same household size lived with the exact same household members. It could be that the stress of mortgage delinquency and foreclosure causes people to change who they live with. Or, it could be that adverse life events, such as illness or divorce, cause both foreclosure and changes in household composition.

One specific aspect of household structure that has surfaced in media stories is the tendency of post-foreclosure borrowers to move in with parents who can help support them financially. We assess this hypothesis by examining the fraction of individuals who live with an adult at least 20 years older. As shown in Table 4, 12 percent of the post-foreclosure sample moved in with an older adult, compared with 5 percent of the comparison group. Therefore, post-foreclosure migrants are somewhat more likely to move in with older individuals. However, this difference is fairly small—the 7 percentage point difference between the two groups is only 1/5 of the standard deviation of the fraction of individuals that live with an adult at least 20 years older. The vast majority of post-foreclosure migrants do not appear to move in with older family members to defray housing expenses.

Homeownership and access to credit

Another important aspect of housing consumption is homeownership. Owner-occupied properties are more likely than renter-occupied units to be single-family structures, and in general single-family housing units tend to be larger and higher quality than multifamily. Even

within the category of single-family structures, owner-occupied units tend to be larger and higher quality.[20]

We do not observe housing tenure in the FRBNY/Equifax Consumer Credit Panel, so we use the presence of a mortgage to proxy for homeownership. Table 5 shows that in the early period only 6 percent of post-foreclosure borrowers had a mortgage in the second year after a foreclosure start, and this fraction drops to 2 percent in the later period. Post-foreclosure individuals are also less likely to live with other household members who have a mortgage, a result that makes sense if the foreclosed property was jointly held by multiple household members or if post-foreclosure migrants are not moving in with other people. All together, only about 1/5 of post-foreclosure individuals lived in a household where at least one person had a mortgage. Individuals in the comparison group are much more likely to have a mortgage or to live in a household with someone else who does. Thus, post-foreclosure individuals are much less likely than the comparison group to live in owner-occupied units.

The higher probability of living in rental housing suggests that post-foreclosure borrowers are less likely to live in single-family structures. Indeed, the fraction of individuals that live in a single-family unit falls notably after foreclosure (see Table 5). In the 2006-2008 period, 22 percent of post-foreclosure borrowers switched from single-family to a multifamily building, compared with 3 percent of the comparison group. Nevertheless, about 3/4 of post-foreclosure borrowers lived in single-family structures.

Because homeownership and structure type are so highly correlated, Table 5 also shows the joint distribution of these two variables. Most (60 percent) of post-foreclosure individuals

[20] The 2007 American Housing Survey reports a summary measure of housing quality based on a host of survey questions. Using this measure, 96 percent of single-family units and 90 percent of multifamily units are rated as adequate. Among single-family units, 97 percent of owner-occupied units and 92 percent of renter-occupied units are rated as adequate.

live in single-family structures with no mortgage. These individuals are likely to be renting a single-family unit since only 1/3 of them exhibit the increase in household size that we would expect if they were moving in with family or friends who own their house with no mortgage. About 1/4 of post-foreclosure individuals live in multifamily structures with no mortgage, which are likely rental apartments. The remainder of post-foreclosure borrowers live in single-family structures with a mortgage. This group is the most likely to have moved in with family or friends. Indeed, slightly more than half of them experienced an increase in household size.

Migration distance and neighborhood characteristics

In addition to household size and tenure choice, migration distance and neighborhood characteristics are also indictors of changes in housing consumption. In this section, we exploit the detailed geographic identifiers provided in the FRBNY/Equifax Consumer Credit Panel to investigate these two aspects of the post-foreclosure experience.

Table 6 compares the migration distance of the post-foreclosure individuals to that of the movers in the comparison group. We exclude non-movers from the comparison group in order to focus on how foreclosure affects neighborhood choice conditional on having decided to move. Slightly more than half of post-foreclosure migrants cross tract boundaries but remain within the same county. Most of the rest move a farther distance, while less than 10 percent remain within the same tract. About 1/5 of the post-foreclosure group moves a far-enough distance to reside in a difference metropolitan area, indicating that they can participate in a different local labor market.

In general, the location choices of the comparison group are similar to those of the foreclosure group. One notable exception is that in the recent period, the post-foreclosure

individuals are a little less likely to cross state lines and therefore are less likely to move to a different metropolitan area. Thus, the desire to remain in the same local labor market may prevent post-foreclosure borrowers from moving as far as they would have otherwise. However, the difference between the two groups is less noticeable in the earlier half of the sample. It is unlikely that the desire to remain in the same school district or catchment area for a local school affects the post-foreclosure migration decision since the fraction of individuals who remain in the same school district or remain in the same Census tract (a proxy for local school catchment areas) is the same for the post-foreclosure and comparison groups.

In Table 7, we examine the change in neighborhood characteristics as measured at the block and block group level in the 2000 Census.[21] Not only are these characteristics likely correlated with the quality of an individual's housing unit, but they also signal the quality of neighborhood amenities.

We start by examining the characteristics of the Census block, which is small enough that variation of housing characteristics within the block is likely small (as mentioned above the median block in our sample has 28 housing units). Consistent with the homeownership outcomes discussed above, post-foreclosure borrowers tend to move to denser neighborhoods with less owner-occupied housing. By contrast, individuals in the comparison group tend to move to less dense locations.[22] The fraction of female-headed households, a measure likely correlated with low income, edges up slightly for post-foreclosure migrants, but by only a very

[21] The sample is limited to individuals who crossed block or block group boundaries, depending on the particular characteristic in question. Since the pre- and post-foreclosure characteristics are both measured at the same point in time, our analysis is not confounded by any potential effect of migrants on the neighborhood. It is possible that some neighborhoods changed appreciably over the course of our sample period, which would introduce some noise into these measures. However, we have no reason to suspect that the degree of noise would be different for the post-foreclosure and comparison groups.

[22] Although average housing unit density for the comparison group does not fall in the second half of the sample, median housing unit density does fall.

small amount. However, the fractions of black and Hispanic residents do not increase, as might be expected if post-foreclosure individuals were moving to very urban neighborhoods.

Next we examine characteristics of the block group, defined as a cluster of census blocks having the same first digit of their identifying number within a census tract. The median block group in our sample has 475 housing units, so it still defines a relatively small area. Table 7 shows that post-foreclosure migrants tend to move to block groups with a slightly smaller number of rooms per housing unit and lower median income. Post-foreclosure migrants also reduce their average commute time a bit more than the comparison migrants. However, these differences are minor. For example, average block group income falls by 3 percent for post-foreclosure borrowers, a tiny decrease compared to the standard deviation of income across block groups, which is about 47 percentage points. We also find no important differences in the composition of educational attainment, median house value, or median rent. Consequently, it does not appear that post-foreclosure borrowers are moving to much less desirable neighborhoods.[23]

While post-foreclosure borrowers do not tend to move to much less desirable neighborhoods on average, it is possible that some individuals do end up in a significantly lower quality location. To investigate this possibility, we calculate the fraction of individuals that move to a substantially less desirable neighborhood as measured by various block and block group characteristics. About 30 percent of post-foreclosure borrowers move to a neighborhood with median income that is at least 25 percent lower than their previous neighborhood, only a few percentage points more than the comparison group. Results for other block and block group characteristics are similar—the fraction of post-foreclosure borrowers who move to a much less

[23] We find similar results when using regression analysis to control for the observable initial characteristics of the individuals, which include age, credit score, mortgage balance, credit card and auto loan use, delinquency rates on mortgages, credit cards, and auto loans, and Census tract indicators.

desirable neighborhood is not much more than the comparison group. These results reinforce the conclusion that foreclosure does not cause borrowers to move to much less desirable neighborhoods than their previous location, and it seems they would have chosen a similar neighborhood had they not experienced a foreclosure.

Finally, we consider whether housing consumption choices might be different for post-foreclosure borrowers who initially live in low income or low house value neighborhoods, and therefore may have more difficulty dealing with foreclosure. Even for this group, average household size does not increase noticeably and the neighborhood choices of migrants are not much different than the comparison group. In fact, individuals in both groups tend to move to substantially higher income, more expensive neighborhoods, showing that mean reversion in income is more important than foreclosure in determining where these people move.

Conclusion

Even though the wave of foreclosures has been a major concern of researchers and policy makers for several years, we are armed with little information on what happens to households after they experience a foreclosure. This paper aims to provide evidence on post-foreclosure outcomes that are related to housing consumption, including household formation, homeownership, and neighborhood characteristics. Some of our findings are consistent with common beliefs. Post-foreclosure individuals experience more changes in household composition and are less likely to live in owner-occupied housing. They also tend to move to denser, more urban neighborhoods.

However, a number of our results are fairly surprising. Only about half of borrowers whose mortgage enters foreclosure have moved even two years later, suggesting that many

foreclosures are worked out through refinancing or other means. As for borrowers who do move after a foreclosure, they do not seem to end up in substantially more crowded living conditions or less-desirable neighborhoods. In particular, average household size does not increase and only a small fraction move in with older individuals (possibly their parents). Although foreclosure increases the probability that an individual will move to a multifamily building, most post-foreclosure migrants remain in single-family structures. Moreover, their new neighborhood does not have significantly lower median income, median house value, or median rent than their old neighborhood. Given that housing unit quality is highly correlated with neighborhood affluence, our evidence suggests that post-foreclosure migrants do not move to substantially lower quality housing units.

Simple models suggest that post-foreclosure borrowers should reduce their housing consumption, either because foreclosure reduces access to credit or because a negative shock that precipitates foreclosure might permanently reduce household income. However, the empirical evidence suggests that, on average, the post-foreclosure reduction in housing consumption is relatively minor. We do find adverse outcomes, such as moving in with another household or moving to a much lower income neighborhood, for a small subset of our sample. Yet in many other cases, housing consumption does not appear to decrease.

At least four reasons may explain this result. First, it is possible that we define neighborhoods too broadly, thereby overlooking significant within-neighborhood variation in housing unit quality. In this case, post-foreclosure borrowers could be moving to smaller, lower quality housing units in neighborhoods that appear to be no worse than their original neighborhood. While this argument may be relevant for some locations, we believe that the typical block and block group is small enough that heterogeneity within these neighborhoods is

relatively minor. Moreover, we measure mortgage holding, structure type, and household size and composition for individual borrowers, so results related to these outcomes would not suffer from mismeasurement of neighborhood characteristics.

Second, measurement error in identifying foreclosure would reduce the observed differences between the foreclosure and comparison groups. However, the extremely low fraction of post-foreclosure borrowers with a mortgage suggests that most of these borrowers did, in fact, experience a foreclosure. Moreover, in unreported results we find that the credit scores of the post-foreclosure borrowers are lower than the comparison group. Post-foreclosure individuals are also less likely to have a credit card and have a lower credit limit conditional on having a card. These results all point to real effects of foreclosure that are identifiable in our data.

Third, it is possible that households are able to achieve a reduction in housing expenditures through a reduction in the price of housing services rather than through a reduction in the quantity or quality consumed. However, rents did not fall at any point during our sample period, so the scope to reduce expenditures through prices was likely small.

Fourth, when faced with a tighter budget constraint households might choose to reduce other forms of consumption or save less while continuing to spend a similar amount on housing. In other words, the demand for housing might be very inelastic. The nature of our data does not allow us to explore this possibility, so further research using alternative data sources would be valuable. A related possibility is that foreclosure is simply not a large enough shock to lead to substantial changes in any form of consumption. This interpretation would make sense if foreclosures were largely the result of strategic default, because borrowers who default solely because the property is worth less than the mortgage would still have the resources to finance

other expenditures. However, other studies have found the role of strategic defaults to be fairly limited (Foote et al. 2008 and Bhutta et al. 2010).

Overall, we lean towards the interpretation that for the average borrower who experienced a foreclosure, the consequences were not adverse enough to severely reduce housing consumption. It is difficult to say whether this small effect is because the shock that leads to foreclosure is not long-lasting, because the credit constraints imposed by having a foreclosure on one's credit report are not large, or because housing services are more inelastic than other forms of consumption.[24] More research on the causes and consequences of foreclosure would clearly be helpful. In addition, it is possible that the foreclosures that occurred during the recent recession have had larger effects than those that occurred earlier in the decade. Since it can take several years for foreclosure to result in changes in housing consumption, it will be a few more years before we can evaluate this possibility.

[24] For example, many former borrowers may have found another job by the second year after an unemployment-induced foreclosure. In addition, even though foreclosure stays on one's credit file for seven years, its impact on subprime borrowers'credit scores dissipates considerably after the first 2 years (Brevoort and Cooper, 2010).

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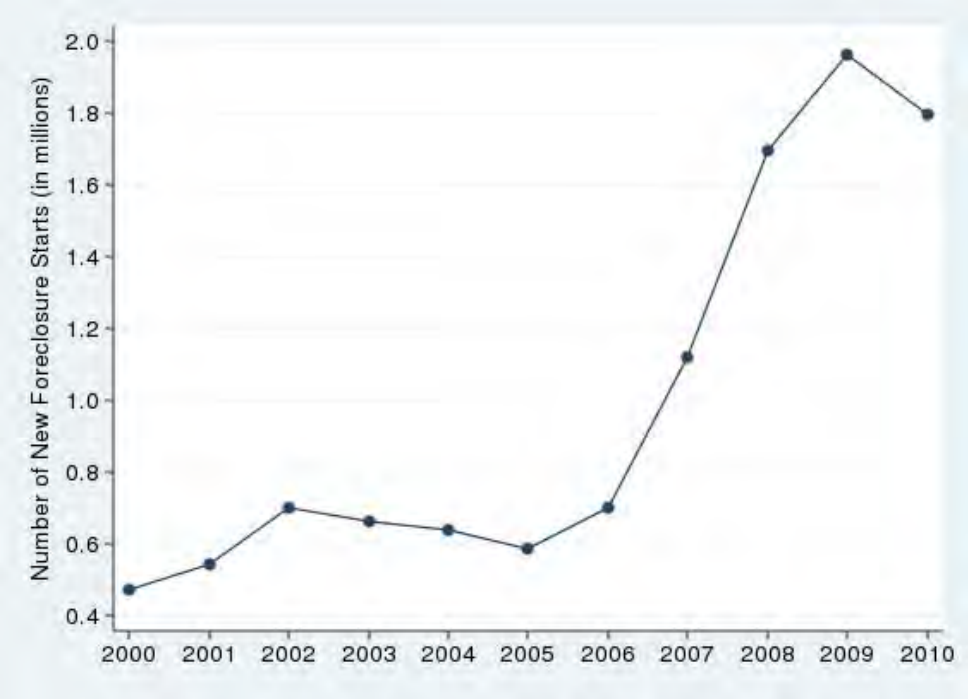
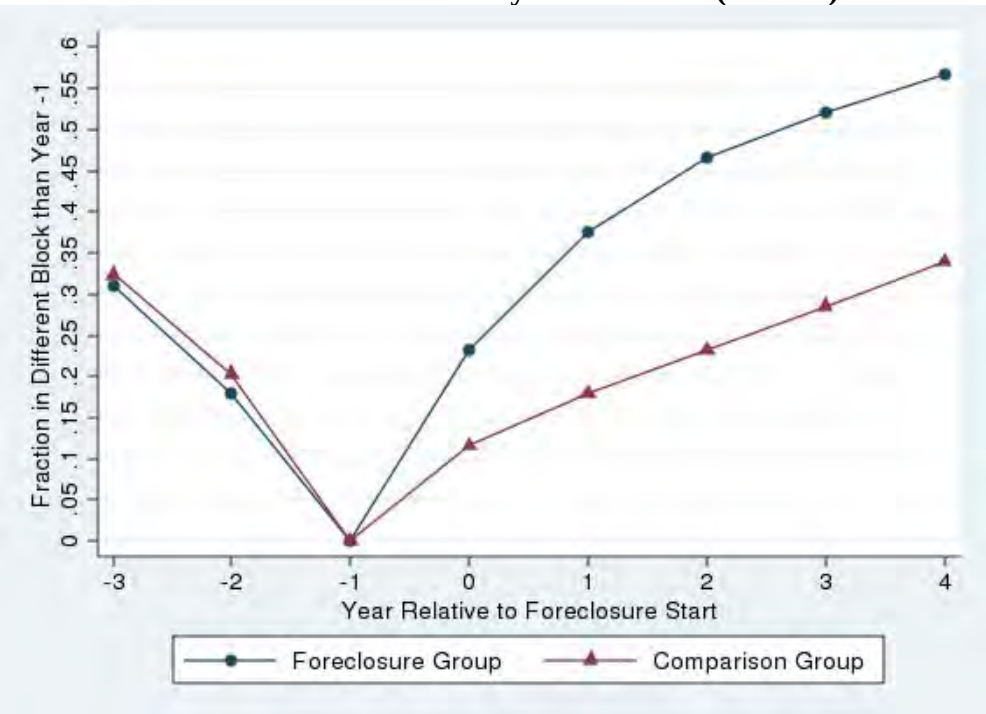
Figure 1. Number of New Foreclosure Starts by Year



Source: FRBNY/Equifax Consumer Credit Panel.

Figure 2. Fraction of Individuals Living in a Different Census Block than in the Year when They are Matched (Year -1)



Source: FRBNY/Equifax Consumer Credit Panel.

Table 1. Comparison of Foreclosure Sample and Comparison Group
In the Year Prior to Foreclosure

	1999-2004		2005-2007	
	FC=0	FC=1	FC=0	FC=1
Mean credit score	537	534	571	568
Median credit score	534	530	567	562
Mean age	42.1	42.1	42.0	42.0
Mean household size	2.19	2.13	2.29	2.27
Mean mortgage balance	99,718	102,097	188,757	201,775
Median mortgage balance	86,024	86,198	151,932	152,901
Mean household mortgage balance	110,189	112,783	208,426	227,814
Median household mortgage balance	90,279	90,403	158,464	161,559
Fraction 30-60 days late on mortgage	0.16	0.35	0.14	0.31
Fraction 90+ days late on mortgage	0.05	0.20	0.04	0.16
Fraction with credit card	0.85	0.70	0.85	0.74
Mean credit card balance	9,281	7,124	10,885	8,769
Median credit card balance	4,646	3,019	4,929	3,498
Fraction 30-60 days late on credit card	0.17	0.12	0.14	0.10
Fraction 90+ days late on credit card	0.34	0.40	0.26	0.27
Fraction with auto loan	0.47	0.42	0.55	0.52
Mean auto loan balance	15,951	15,687	18,928	20,595
Median auto loan balance	13,323	12,852	15,565	15,728
Fraction 30-60 days late on auto loan	0.12	0.18	0.11	0.13
Fraction 90+ days late on auto loan	0.06	0.10	0.05	0.08
Fraction with credit inquiry in past 12 months	0.86	0.85	0.87	0.89
Fraction living in single-family structures	0.95	0.95	0.95	0.95
N (unweighted)	282,855	62,323	239,379	65,308

Note. Year in column heading refers to the year prior to foreclosure. FC=1 are individuals who experienced a foreclosure start. FC=0 are individuals in the comparison group. Mortgage, credit card, and auto loan balance and delinquency status are conditional on having such accounts.
Source: FRBNY/Equifax Consumer Credit Panel.

Table 2. Probability of Moving between Year Prior to Foreclosure Start and Second Year After Foreclosure Start

	Full Sample		Block FE		Non-Jud	Jud	2000-2005	2006-2008
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreclosure start	0.232**	0.238**	0.328**	0.330**	0.254**	0.202**	0.184**	0.277**
	(0.008)	(0.008)	(0.020)	(0.023)	(0.006)	(0.010)	(0.009)	(0.013)
Controls of matching criteria		X						
Other controls		X						
Block fixed effects				X				
Adjusted R^2	0.060	0.145	0.114	0.285	0.069	0.047	0.037	0.086
N	616,649	616,649	5,525	5,525	368,791	247,858	321,036	295,613

Note. Controls of matching criteria include age group, risk score category, mortgage balance category, address type, year fixed effects, and tract/ZIP code/county fixed effects. Other controls include whether have credit card, credit card balance category, whether have auto loan, auto loan balance category, mortgage delinquency status, credit card delinquency status, and auto loan delinquency status. Standard errors in parenthesis are clustered at the state level. * significant at 0.05 level and ** significant at 0.01 level. Source: FRBNY/Equifax Consumer Credit Panel.

Table 3. Local House Price Appreciation and Mobility Outcome after Foreclosure Start

	ZIP HPI	County HPI	MSA HPI
	(1)	(2)	(3)
Foreclosure start	0.267**	0.266**	0.269**
	(0.010)	(0.010)	(0.010)
Cumulative HPA in the two years prior to foreclosure start	0.035	0.044	0.009
	(0.041)	(0.050)	(0.034)
(Foreclosure start)*(Cumulative HPA)	-0.287**	-0.302**	-0.188**
	(0.046)	(0.058)	(0.050)
State*Year fixed effects	X	X	X
Adjusted R^2	0.073	0.072	0.079
N	502,396	601,438	360,430

Note. Standard errors in parenthesis are clustered at the state level. * significant at 0.05 level and ** significant at 0.01 level.
Source: FRBNY/Equifax Consumer Credit Panel.

Table 4. Household Size and Composition

	2000-2005				2006-2008			
	FC=0		FC=1		FC=0		FC=1	
	Before	After	Before	After	Before	After	Before	After
Average household size	2.18	2.30	2.14	2.23	2.28	2.31	2.24	2.27
Fraction that decrease household size	--	0.21	--	0.32	--	0.21	--	0.33
Fraction with same household size	--	0.42	--	0.27	--	0.52	--	0.28
Fraction that increase household size	--	0.31	--	0.37	--	0.23	--	0.35
Fraction living with same household members	--	0.37	--	0.19	--	0.47	--	0.18
Among households of same size, fraction living with same household members	--	0.77	--	0.46	--	0.85	--	0.47
Fraction moved in with an adult >= 20 years older	--	0.05	--	0.12	--	0.05	--	0.12
N (unweighted)	118,583	118,583	23,830	23,830	113,925	113,925	26,741	26,741

Note. Before = year prior to foreclosure and after = 2 years after foreclosure. FC=1 are individuals who experience a foreclosure start and move. FC=0 are individuals in the comparison group (whether they moved or not). Year in column heading refers to the year of the foreclosure start. Source: FRBNY/Equifax Consumer Credit Panel.

Table 5. Homeownership and Structure Type

	2000-2005				2006-2008			
	FC=0		FC=1		FC=0		FC=1	
	Before	After	Before	After	Before	After	Before	After
Fraction primary individual with mortgage	1	0.68	1	0.06	1	0.77	1	0.02
Fraction any HH member with a mortgage	1	0.75	1	0.20	1	0.81	1	0.17
Fraction living in a single-family structure	0.94	0.94	0.94	0.78	0.94	0.93	0.94	0.76
Fraction transitioning from single- to multi-family	--	0.04	--	0.20	--	0.03	--	0.22
Joint distribution of homeownership and structure type								
Fraction any HH member with a mortgage and in SF structure	--	0.72	--	0.19	--	0.77	--	0.16
Fraction any HH member with a mortgage and in MF structure	--	0.03	--	0.01	--	0.04	--	0.01
Fraction no HH member with a mortgage and in SF structure	--	0.21	--	0.59	--	0.16	--	0.60
Fraction no HH member with a mortgage and in MF structure	--	0.03	--	0.21	--	0.02	--	0.23
N (unweighted)	31,199	31,199	11,886	11,886	20,721	20,721	10,896	10,896

Note. Before = year prior to foreclosure and after = 2 years after foreclosure. FC=1 are individuals who experience a foreclosure start and move. FC=0 are individuals in the comparison group (whether they moved or not). Year in column heading refers to the year of the foreclosure start. Source: FRBNY/Equifax Consumer Credit Panel.

Table 6. Percent of Migrants by Distance of Move

	2000-2005		2006-2008	
	FC=0	FC=1	FC=0	FC=1
Inter-State	0.18	0.16	0.18	0.14
Within-State, Inter-County	0.22	0.21	0.21	0.20
Within-County, Inter-Tract	0.52	0.56	0.50	0.57
Within-Tract, Inter-Block	0.07	0.07	0.11	0.09
Inter-MSA	0.22	0.21	0.24	0.20
Inter-School District	0.60	0.58	0.60	0.58
N (unweighted)	31,984	12,185	22,320	11,781

Note. FC=1 are individuals who experience a foreclosure start and move. FC=0 are individuals in the comparison group who move. Source: FRBNY/Equifax Consumer Credit Panel.

Table 7. Change in Neighborhood Characteristics

	2000-2005				2006-2008			
	FC=0		FC=1		FC=0		FC=1	
	Before	After	Before	After	Before	After	Before	After
Block housing unit density	1.43	1.18	1.29	1.42	1.11	1.11	1.12	1.37
Block population density	3.47	2.82	3.27	3.33	2.77	2.61	2.96	3.30
Block fraction owner	0.73	0.72	0.73	0.64	0.75	0.72	0.75	0.65
Block fraction married couple households	0.55	0.56	0.55	0.51	0.58	0.58	0.57	0.53
Block fraction female-headed households	0.27	0.26	0.28	0.30	0.25	0.25	0.26	0.28
Block fraction black	0.15	0.12	0.16	0.15	0.11	0.09	0.12	0.11
Block fraction Hispanic	0.14	0.12	0.15	0.14	0.15	0.14	0.17	0.17
Block group average number rooms	5.51	5.59	5.48	5.35	5.58	5.56	5.52	5.32
Block group average commute time	26.6	26.6	26.8	26.1	27.2	26.9	27.5	26.8
Block Group fraction less than high school	0.19	0.17	0.20	0.19	0.17	0.17	0.19	0.19
Block Group fraction high school	0.27	0.27	0.28	0.28	0.26	0.26	0.27	0.27
Block Group some college	0.30	0.30	0.30	0.30	0.31	0.30	0.31	0.30
Block Group college+	0.24	0.25	0.22	0.23	0.25	0.27	0.22	0.24
Average Block Group median income	49,164	50,715	47,742	46,514	52,986	53,413	50,616	49,027
Median Block Group median income	45,972	47,431	44,803	42,969	50,256	50,347	47,500	45,644
Average Block group median house value	130,190	135,825	125,480	126,139	150,777	156,397	138,635	141,693
Median Block group median house value	111,900	117,000	107,500	108,900	129,400	132,800	118,200	123,100
Average Block group median rent	624	618	609	597	673	662	651	641
Median Block group median rent	579	573	566	556	624	611	606	609
Fraction change in fraction black > 0.1	--	0.13	--	0.15	--	0.11	--	0.13
Fraction change in fraction Hispanic > 0.1	--	0.13	--	0.15	--	0.15	--	0.18
Fraction change in fraction female-headed HH > 0.1	--	0.27	--	0.33	--	0.29	--	0.33
Fraction change in ln(income) < -0.25	--	0.25	--	0.30	--	0.28	--	0.30
Fraction change in ln(house value) < -0.25	--	0.25	--	0.28	--	0.27	--	0.27
Fraction change in ln(rent) < -0.25	--	0.26	--	0.26	--	0.28	--	0.26
Fraction change in ln(rooms) < -0.25	--	0.14	--	0.18	--	0.17	--	0.20
N for block-level characteristics (unweighted)	31984	31984	12185	12185	22320	22320	11781	11781
N for block group-level characteristics (unweighted)	30,018	30,018	11,468	11,468	20,169	20,169	10,677	10,677

Note. Before = year prior to foreclosure and after = 2 years after foreclosure. FC=1 are individuals who experience a foreclosure start and move across blocks (for block-level characteristics) and block groups (for block group-level characteristics). FC=0 are individuals in the comparison group who move across blocks (for block-level characteristics) and block groups (for block group-level characteristics). All neighborhood characteristics are measured in the year 2000. Source: FRBNY/Equifax Consumer Credit Panel and 2000 Census.