

# Mobility and Exit from Homeownership: Implications for Community Reinvestment Lending

**Jonathan S. Spader and Roberto G. Quercia**

*University of North Carolina at Chapel Hill*

## *Abstract*

This study focuses on the transition out of homeownership among community reinvestment loan borrowers, documenting patterns among low-income and minority households. We show that the higher rates of homeownership exit documented among low-income and minority borrowers in the larger population do not hold for community reinvestment mortgage borrowers. We model the transition, separating the determinants of mobility and tenure choice. Our results show that low-income and minority homeowners are less likely than their high-income and white counterparts to move, but no less likely to purchase a new home when they do. These findings are contrasted with the results of a model that specifies the transitions out of homeownership as the purchase of a new home and the return to renting.

**Keywords:** Community Reinvestment Act (CRA); Mobility; Tenure choice

## **Introduction**

Evaluations of federal efforts have focused almost exclusively on the ability to *achieve* homeownership and have paid far less attention to the ability to *sustain* it. The primary exception to this pattern is the recent emergence of dynamic studies of homeownership transitions.<sup>1</sup> Following households through several moves, such studies examine both the factors associated with homeownership entry and the factors associated with homeownership exit (Boehm and Schlottman 2004; Haurin and Rosenthal 2004; Reid 2005).

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<sup>1</sup>Much of the previous literature on mobility and tenure choice seeks to identify the determinants of tenure choice in a cross-section. By contrast, dynamic studies of homeownership follow households through the transition between tenures.

Attention to the process of exiting homeownership may be particularly relevant to understanding the experiences of low-income and minority borrowers. If these households are more likely to experience periods of low income or to purchase in neighborhoods with stagnant or declining home prices, they may be less likely to sustain homeownership and thus be less able to capture its economic benefits. Dynamic studies of homeownership transitions within the larger population of homeowners consistently show that low-income and minority households are more likely to return to renting and less likely to purchase a new home than their high-income and white counterparts (Boehm and Schlottman 2004; Haurin and Rosenthal 2004; Reid 2005). However, these patterns are documented at the aggregate level and do not examine variations in these patterns across different groups of homeowners and types of mortgages.

The potential for variation in households' ability to sustain homeownership is likely to have grown with the segmentation of the mortgage market and the differentiation of multiple types of instruments. In particular, the higher rates of default and foreclosure associated with subprime and low-down-payment mortgages suggest that these products both create access to homeownership and increase the flow of households that return to renting (Schloemer et al. 2006). While much of the variation in default rates may be due to differences in the underlying risk of mortgage applicants, several analysts have also raised concerns about the potential for low-income and minority borrowers to be channeled toward these products (Courchane, Surette, and Zorn 2004). Further, the concentration of these mortgages among low-income and minority borrowers in low-income and minority neighborhoods raises important questions about the factors contributing to the elevated rates of homeownership exit among these homeowners (Calem, Gillen, and Wachter 2004; Calem, Hershaff, and Wachter 2004).

This article focuses on transitions out of owned homes among borrowers who received 30-year, fixed-rate community reinvestment mortgages purchased through the Community Advantage Home Loan Secondary Market Program (CAP). With a grant from the Ford Foundation, Self-Help—a large community development financial institution in Durham, NC—purchased loans with one or more flexible underwriting requirements. These characteristics include, but are not limited to, a low down payment or none at all, a higher debt-to-income ratio, a waiver of private mortgage insurance, and/or a limited credit history. While many of these mortgages reflect community reinvestment loans that the lender could not otherwise sell to the secondary market, some also reflect new mortgage products intended for sale to Self-

Help. In all cases, the loans are originated by prime lending institutions and serve low- to moderate-income borrowers and neighborhoods.<sup>2</sup>

The resulting loan portfolio is not designed to create a representative sample of community reinvestment mortgages, because sample collection occurred through Self-Help's purchasing activities. Nevertheless, it offers rich data for a sample of fixed-rate, community reinvestment mortgages originated by 19 participating lenders in 41 states.<sup>3</sup> This article examines the patterns of homeownership exit for this sample, comparing these transitions with a nationally representative sample of homeowners collected from the Panel Study of Income Dynamics (PSID).<sup>4</sup>

We develop an estimation strategy that separates mobility from tenure choice. We then compare this model with the specification used in previous analyses, in which new home purchase (move and own) and the return to renting (move and rent) are defined as the outcomes of interest. We also examine the sensitivity of our findings to distinguishing between voluntary moves and forced moves arising from default or the inability to afford the home. These analyses lead to several results:

1. Low-income and minority homeowners in the PSID are substantially more likely to return to renting than high-income and white households. By contrast, we find that this gap closes among community reinvestment mortgage borrowers.
2. All else being equal, low-income and minority community reinvestment homeowners in CAP are substantially less likely to move, but no less likely to purchase a new home when they do. These households are in fact more likely to purchase a new home when the move is not stimulated by a default or distressed exit.

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<sup>2</sup>The set of lenders originating CAP loans includes small institutions, regional banks, and large national lenders. In most cases, these institutions initiated contact with Self-Help about the sale of a portfolio of qualifying loans.

<sup>3</sup>Community reinvestment mortgages include the set of mortgages for which lenders receive credit under Community Reinvestment Act (CRA) regulations. A further description of the mortgages that qualify for purchase through CAP is provided in a later section.

<sup>4</sup>The PSID follows a set of households through several decades, supplementing its original sample with weights and additional sampling to maintain a nationally representative cross-section. We choose to compare CAP and PSID households both because the PSID data allow for a nationally representative sample to be drawn and also because PSID data are used in the previous analyses of homeownership transitions. The timing of the PSID survey waves also mirrors the timing in the CAP data of home purchases and subsequent mobility decisions.

3. Mobility and tenure choice reflect substantively different decisions and must be separated in analyses of homeownership transitions. When mobility and tenure choice are not separated, estimates derived from analyses of new home purchase and the return to renting suffer from type II error, particularly with respect to the low-income and minority indicator variables.

These findings are specific to community reinvestment mortgages, so caution must be exercised in extrapolating to the larger mortgage market. However, they provide some evidence that community reinvestment lending may be an effective tool for creating sustainable homeownership among low-income and minority households. They also raise important questions about the determinants of elevated rates of homeownership exit among low-income and minority households in the larger population.

The following section presents and discusses the emerging literature on homeownership transitions. The next section examines these studies in the context of the methodological literature relating to mobility and tenure choice. The third section presents both an estimation model that separates mobility from tenure choice and a model that specifies new home purchase (move and own) and the return to renting (move and rent) as the outcomes of interest. The fourth and fifth sections discuss the CAP program and describe the characteristics of CAP borrowers, respectively. The sixth section compares the transitions out of homeownership among CAP and PSID borrowers. The seventh section presents and discusses our estimation results, and the eighth section is the conclusion.

### **Homeownership transitions among low-income and minority homeowners**

The wide disparity in the homeownership rates of white, black, and Hispanic borrowers results from differential rates of transition both into and out of homeownership. In 2006, 68.8 percent of all U.S. households owned a home, although only 47.9 percent of black households and 49.7 percent of Hispanic households owned a home (U.S. Bureau of the Census, Housing and Household Economic Statistics Division 2008). A substantial literature documents the relative presence of wealth, income, and credit barriers to homeownership entry and the extent to which these factors explain differences in homeownership rates among white, black, and Hispanic households (see, for example, Barakova et al. 2003; Charles and Hurst 2002; Coulson 1999; and Painter, Gabriel, and Myers 2001). These studies offer rich evidence documenting both the obstacles to homeownership entry for low-income and

minority households and the factors predicting whether a household owns a home at any given point in time. However, none of these studies examines the transition out of homeownership.

Boehm and Schlottman (2004) build on this work by presenting a dynamic approach to homeownership transitions, examining the predictors of both homeownership entry and homeownership exit. They find that a substantial proportion of homeowners return to renting and that lower-income and minority households are relatively more likely to exit homeownership. Following PSID households between 1984 and 1992, they report that minority households with below-median incomes have an estimated 30 percent cumulative probability of ever owning a home and a 23 percent cumulative probability of having owners return to renting over the period observed. These figures are substantially worse than the 54 percent probability of ownership and 10 percent probability of returning to renting observed among the full sample. The authors report similar lags in the likelihood that low-income and minority households will progress into a second home.

These differences in the relative propensity of exit from homeownership contribute directly to the gaps in homeownership rates by race/ethnicity and income. Haurin and Rosenthal (2004) similarly examine homeowners' transitions between owning and renting, linking differences in the likelihood of exit from homeownership between white, black, and Hispanic households to gaps in the homeownership rates for these groups. Following households in the National Longitudinal Survey of Youth between 1976 and 2000, Haurin and Rosenthal (2004) find that white households have longer spells of homeownership and shorter spells of renting than either black or Hispanic households.

Reid (2005) reports similar conclusions for households with incomes below 80 percent of the area median income. Following PSID households between 1976 and 1989, she concludes that lower-income households are both less likely to purchase a new home and more likely to return to renting than moderate- and higher-income households.<sup>5</sup>

Taken together, these studies consistently suggest that low-income and minority households are more likely to exit homeownership and less likely to move up the housing ladder into a new home.<sup>6</sup> This finding carries

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<sup>5</sup>Dieleman and Clark's (1995) analysis also suggests that lower-income households are more likely to transition from owning to renting, although this is not the focus of the analysis.

<sup>6</sup>For a more general review of the mobility and default patterns of low-income and minority households, see Herbert and Belsky (2006).

important implications for policy, but must be interpreted carefully. First, all three studies follow samples of homeowners collected before the expansion of risk-based pricing and flexible underwriting in the mid-1990s. These developments have deeply influenced the availability and nature of mortgage credit extended to low-income and minority populations in subsequent years (Listokin et al. 2001) and thus may also have influenced the homeownership experiences of such borrowers.

Second, these studies consistently suggest that low-income and minority households are more likely than high-income and white households to exit homeownership, but are less explicit regarding the mechanisms underlying these patterns. Understanding the implications of these gaps for federal homeownership policy requires more specific knowledge about the sources of these differences and the stability of this finding across different mortgage products. For instance, racial differences in household wealth may help explain differences in households' ability to sustain homeownership during periods of economic hardship. Racial differences in family wealth and the likelihood of parental transfers may contribute as well.

By contrast, the differences in homeownership exit could also result from discrimination in the housing and mortgage markets. A relatively large literature has examined racial preferences for housing and the presence of discrimination in housing markets. Beginning with the Boston Fed study (Munnell et al. 1996), a similar literature has examined discrimination in mortgage lending (see Ross and Yinger 2002 for a full review).<sup>7</sup> More recently, scholars have raised questions about the extent and consequences of discrimination in the mortgage search and origination processes, particularly the potential for low-income and minority borrowers to be channeled toward higher-priced mortgages.

Existing work has documented that subprime loans are concentrated in low-income and minority neighborhoods (Calem, Gillen, and Wachter 2004; Calem, Hershaff, and Wachter 2004) and that low-income and minority borrowers are more likely to receive high-priced loans regardless of their neighborhood profiles (Ding et al. 2008). These patterns may contribute to differences in the rates of homeownership exit if low-income and minority borrowers are more likely to receive mortgages with predatory terms or, more benignly, if these borrowers are more likely to be dissatisfied with their

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<sup>7</sup>While most of this literature acknowledges the existence of discrimination among some lenders, there is considerable debate over its extent and consequences in the housing and mortgage markets. See Ross and Yinger (2002) for a full review of the existing evidence and current debate.

mortgage. Conversely, they may be less likely to exit homeownership if discrimination in these processes increases the transaction costs associated with moving.

### **Mobility, tenure choice, and the transition out of homeownership**

The studies of homeownership transition discussed in the previous section follow households through multiple moves, examining the hazards of transitioning from each housing state to the next. The outcomes of interest for homeowners are thus specified as either the duration of ownership or as new home purchase (move and own) and the return to renting (move and rent), and these models are used to calculate the predicted probabilities that homeowners will transition into a new home or return to renting. For the purposes of this study, we use the term *homeownership transitions* to refer to these dynamic studies of housing careers.

Our focus is on a single transition among a sample of homeowners who received community reinvestment mortgages. We examine these transitions out of homeownership, but data constraints prevent us from following households through multiple transitions (e.g., reentry into homeownership).<sup>8</sup> In analyzing transitions out of homeownership, we separate the mobility and tenure choice decisions, assessing the importance of this distinction for understanding the determinants of homeownership exit. Conceptually, the decision on whether to move is substantively distinct from and determined by different factors than the decision to own, although the two are observed simultaneously (Ioannides and Kan 1996; Kan 2000). In this way, a homeowner who purchases a new home implicitly makes an affirmative decision to move and an affirmative decision to own. Similarly, a homeowner who returns to renting makes an affirmative decision to move and a decision to rent. The rest of this section discusses the substantive predictors of mobility and tenure choice, and the following section presents our estimation strategy for separating the determinants of each. (For a more extensive review of the mobility literature, see Dieleman 2001.)

Conceptually, the mobility and tenure choice decisions can be thought of as substantively different acts produced by different determinants. Where mobility decisions are strongly tied to employment and family characteristics,

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<sup>8</sup>The CAP data set limits us to analyzing one move, because we do not observe additional moves before wave 3. Additional moves will be observed in future waves, but the number may be too small to allow for substantial analysis.

the tenure decision is determined primarily by the relative costs of owning and renting and thus is only indirectly tied to life-cycle processes. For instance, the life cycle predicts tenure choice to the extent that the income and wealth accumulation processes affect a household's incentives to save, consume housing, and invest in housing as a financial asset. Both decisions are made even more complex as unexpected financial and nonfinancial events are realized at different stages of the life cycle (Kan 1999). Household transitions between units and tenures are also moderated by changes in the local housing market, employment opportunities, family characteristics, and mortgage and credit availability (Clark, Deurloo, and Dieleman 1994, 2003; Clark and Withers 1999; Kendig 1984; Morrow-Jones and Wenning 2005). While most of these studies focus on the rent-to-own transition, Dieleman and Clark (1995) show that intervening employment and family events also influence decisions to exit homeownership. Taken together, these studies highlight the complexity of the demographic processes that determine mobility.

The variables commonly used to specify mobility and tenure choice equations can be separated into static demographic characteristics, dynamic demographic characteristics (often denoted as trigger events), and neighborhood characteristics (static). First, age, marital status, and the presence of children are commonly used to approximate life-cycle influences. We supplement these variables with a more complete set of static and dynamic demographic characteristics. While static characteristics capture differences across households, dynamic characteristics are included to account for the influence of changes in a household's composition or stage. These change variables include expected and unexpected events and thus reflect both the anticipated adjustment of housing consumption and the household's reaction to unexpected events. We also include the borrower's credit score to account for differences in the cost of financing a new home. The credit score at origination may predict future mobility as well because of default or the inability to afford the home.<sup>9</sup>

Previous work suggests that neighborhood characteristics, in addition to household characteristics, affect the desirability of housing. To the extent that neighborhood quality is associated with the stock of units available to

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<sup>9</sup>In their seminal work on tenure choice, Henderson and Ioannides (1983) argue that tenure choice is directly a function of the relative costs of owning and renting. For households leaving homeownership, we expect that mobility and tenure choice decisions should respond directly to the household's costs of originating a new mortgage. Ideally, we would like to observe the borrower's credit score at the time of the move, but instead are limited to the score at origination.

purchase or rent, these characteristics are likely to influence mobility and tenure choice decisions. While the available evidence focuses on the influence of the characteristics of potential locations (Deng, Ross, and Wachter 2003; Gabriel and Painter 2003), a similar logic is easily extended to the influence of the household's existing neighborhood quality. For homeowners, the characteristics of the current neighborhood are likely to influence mobility if neighborhood quality or public service provision is low, particularly if these characteristics affect home price appreciation.<sup>10</sup>

Last, indicators for household income and race/ethnicity, when inserted into the mobility and tenure choice equations, capture residual differences in likelihood between groups. These variables identify conditional differences in the likelihood of mobility and tenure choice. Where unadjusted mobility and ownership propensities offer the most direct insight into the ability of low-income and minority households to sustain homeownership, these conditional differences reflect the influence of the unobserved characteristics of each group.

The resulting specification of the mobility and tenure choice equations include vectors of static, dynamic, and location characteristics in addition to indicators for whether a household is low income, black, Hispanic, or another nonwhite race/ethnicity. The equations can be represented as follows:

$$\text{Mobility}_i = S_i\beta_1 + D_i\gamma_1 + L_i\delta_1 + X_i\zeta_1 + \varepsilon_{i1} \quad (1)$$

$$\text{Tenure}_i = S_i\beta_2 + D_i\gamma_2 + L_i\delta_2 + X_i\zeta_2 + \varepsilon_{i2} \quad (2)$$

where  $S_i$  includes static demographic characteristics,  $D_i$  includes dynamic demographic characteristics,  $L_i$  includes location characteristics, and  $X_i$  represents the indicator variables for income and race/ethnicity. These equations form the substantive core of our analysis, but cannot be estimated directly from available data because of the censoring of the tenure choice data.<sup>11</sup>

<sup>10</sup>Such neighborhood characteristics are relevant to the extent that changes in either neighborhood characteristics or household demand for neighborhood amenities changes during the course of homeownership. The wealth effects created by differences in home appreciation across neighborhoods may also be relevant to households that prefer higher-quality neighborhoods but do not have enough money to purchase in these areas.

<sup>11</sup>Tenure choice is observed only among households that move during the period of observation. Thus, estimation of equation (2) among movers would reflect only the tenure decisions of movers and not the larger sample. Further explanation of this censoring problem is provided in the next section.

Since the tenure decision is observed only among households that move, an additional adjustment is necessary to estimate this model for the full sample. The following section presents our estimation strategy for identifying the coefficients in equations (1) and (2).

### Estimation strategy

In addition to the substantive justifications for separating mobility and tenure choice, separating the equations is also necessary to identify any factor with opposing influences on mobility and tenure choice. For instance, any factor that is positively associated with mobility and negatively associated with tenure choice could falsely appear to not influence the likelihood of new home purchase, thus raising the threat of type II error. This concern is especially relevant to homeownership transitions, because the effect of each covariate on the likelihood of owning and the likelihood of renting is opposite by definition. Therefore, the coefficient on each covariate is in danger of type II error in either the new home purchase or the return to renting specification.

In examining the transitions of homeowners out of their original home, we therefore estimate the coefficients in equations (1) and (2) for mobility and tenure choice, respectively. To do so, we must further address two characteristics of the data. First, households do not all enter homeownership at precisely the same moment, so we include quarter of origination indicator variables  $\theta(t)$  in the mobility equation to nonparametrically address the influence of duration dependence.<sup>12</sup> In the empirical estimation, these variables will also capture the influence of time-specific economic factors and any cyclical housing market factors.

Estimating mobility and tenure choice is further complicated by the censoring of the tenure choice variable. Painter (2000) notes that analysts examining mobility and tenure choice are forced to grapple with one of two selection problems. First, estimation of tenure choice among the full sample includes tenure decisions made by households in previous decades and under

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<sup>12</sup>Many other studies model mobility using a duration or hazard framework to address the influence of duration dependence. This approach is valuable both in addressing duration dependence and in controlling for the influence of time-varying variables. We choose to specify our model on cross-sectional data, controlling directly for duration dependence by using the set of quarter of origination indicator variables. We further justify this approach in that we are interested in directly identifying the effect of trigger events rather than using variation across time to identify changes in variable values. Given that we observe households at only two points, both the static variables and the trigger events are defined as time-invariant indicator variables.

different housing market conditions. Conversely, estimation of tenure choice among recent movers oversamples young households and other frequent movers. This second type of selection also arises in examining the transition out of homeownership, but can be addressed directly by using a variation of Heckman's (1979) selection model in which the inverse Mill's ratio is included in the second-stage equation to address selection.

A final concern is the simultaneous nature of the mobility and tenure decisions. Kan (2000) suggests that the mobility and tenure choice decisions are further complicated by expected mobility and previous tenure. Households that expect to move within a few years are likely less willing to pay the large transaction costs associated with moving and originating a mortgage. Previous tenure further influences mobility and tenure decisions to the extent that current ownership cultivates a taste for ownership, generates wealth, or traps homeowners in depreciating homes. We can directly address previous tenure with the research design, since ownership of the CAP home is defined as the baseline tenure for all households. We also insert an indicator variable for whether the residence before the CAP home was owned or rented. Unfortunately, we are less able to address the potential influence of expected mobility. Consistent with previous analyses of homeownership transitions (Boehm and Schlottman 2004), we do not observe homeowner expectations and therefore omit expected mobility.

We estimate a variation of the selection model in which the outcomes of both the first- and second-stage equations are dichotomous. Updating equations (1) and (2), we simultaneously estimate

$$\text{Mobility}_i = S_i\beta_1 + D_i\gamma_1 + L_i\delta_1 + X_i\zeta_1 + \theta(t) + \varepsilon_{i1} \quad (3)$$

$$\text{Tenure}_i = S_i\beta_2 + D_i\gamma_2 + L_i\delta_2 + X_i\zeta_2 + \rho\lambda + \varepsilon_{i2} \quad (4)$$

where  $\theta(t)$  are quarter of origination indicator variables and  $\lambda$  is the inverse Mill's ratio,<sup>13</sup> which adjusts for the probability of making an observed tenure choice. The vector  $S_i$  includes the previous homeownership variable, which indicates whether the residence before the CAP home was owned or rented.

<sup>13</sup>The inverse Mill's ratio is defined as the ratio of the probability density function to the cumulative density distribution with respect to the predicted mobility values from the first-stage mobility equation shown in equation (3):  $\phi(Z_{i1}\omega_1')/\Phi(Z_{i1}\omega_1')$ , where  $Z_{i1}$  reflects the set of variables on the right-hand side of equation (3) and  $\omega_1'$  are the estimated coefficients.

To simplify notation, we denote the right-hand side of equation (3) as  $Z_{i1}\omega_1$  and the right-hand side of equation (4) as  $Z_{i2}\omega_2$ . Further, let  $Y_{i1} = 1$  if  $\text{Mobility}_i = 1$  and  $Y_{i2} = 1$  if  $\text{Tenure}_i = 1$ . Using maximum likelihood estimation, we simultaneously estimate the mobility and tenure equations by maximizing the corresponding likelihood function:

$$L = \prod_{i=1}^N [\Phi(Z_{i1}\omega_1, Z_{i2}\omega_2, \eta)]^{Y_{i1}Y_{i2}} [\Phi(Z_{i1}\omega_1) - \Phi(Z_{i1}\omega_1, Z_{i2}\omega_2, \eta)]^{Y_{i1}(1-Y_{i2})} [1 - \Phi(Z_{i1}\omega_1)]^{(1-Y_{i1})} \quad (5)$$

where  $\Phi$  is the cumulative normal function and  $\eta$  is the correlation coefficient for the joint normal distribution.<sup>14</sup>

We compare the previous model of mobility and tenure choice with a model that specifies new home purchase (move and own) and the return to renting (move and rent) as the outcomes of interest. This second model estimates the determinants of each transition using the multinomial logit (MNL) framework, modeling new home purchase and the return to renting as competing risks.<sup>15</sup> While this model is not explicitly identical to those used in previous analyses of these transitions, the estimation strategy is the same.<sup>16</sup> We choose the MNL framework for this analysis because it outputs estimation equations most comparable to those in the selection model.<sup>17</sup> Comparison of the models thus offers insight into how mobility and tenure choice contribute

<sup>14</sup>Kan (2000) estimates mobility and tenure choice in a simultaneous equations model where the two are endogenously included in the opposing equations. This approach is necessary in cross-sectional analyses of the population as a whole, but is neither possible nor necessary with the CAP data set where all households begin in homeownership.

<sup>15</sup>The MNL model presents reliable estimates of the predictors of purchasing a new home and of exiting homeownership if the independence of irrelevant alternatives assumption is met. Because many of the predictors of mobility are likely to be shared, this assumption may not be plausible. Empirical tests using the method developed by Small and Hsiao (1985) show that the assumption holds when “Move and Own” is excluded, but not when “Move and Rent” is excluded.

<sup>16</sup>Previous analyses rely on continuous-time hazard models (Boehm and Schlottman 2004). Clapp et al. (2001) and Clapp, Deng, and An (2006) present an analogous model in the MNL framework. Because our data set observed tenure and borrower characteristics at only two points, the benefits of the hazard model are minimal (see footnote 17).

<sup>17</sup>Clapp et al. (2001) and Clapp, Deng, and An (2006) show that estimation of the MNL framework on a transformed data set is directly comparable to a competing risks duration model with the competing risks directly defined by the definition of the outcome probabilities. We do not transform the data set here in an attempt to minimize the differences between the selection model and the MNL model and thus ensure that the specification of the outcome variables is responsible for any differences between models. Nevertheless, the quarter of origination indicators act as controls for duration dependence and are intuitively similar to their role in the Clapp et al. (2001) model in which they create a nonparametric baseline hazard.

to observed patterns of new home purchase (move and own) and homeownership exit (move and rent). The estimation equation for each outcome is as follows:

$$M_{ij} = S_i\beta_j + D_i\gamma_j + L_i\delta_j + X_i\zeta_j + \theta(t) + \varepsilon_{ij} \tag{6}$$

where the vectors of covariates are the same as those defined for the selection model (the first model of mobility and tenure choice), and  $j$  indexes the outcome measure. Then  $M_{ij}$  indicates the respondent's decision to purchase a new home or to return to renting. The associated likelihood function for this model is

$$L = \prod_{i=1}^N \prod_{j=0}^2 M_{ij} * \Pr(Y_i = j) \tag{7}$$

where

$$\Pr(Y_i = j) = \frac{e^{z_j(0_i)}}{1 + \sum_{k=1}^2 e^{z_k(0_i)}}$$

$$\Pr(Y_i = 0) = \frac{1}{1 + \sum_{k=1}^2 e^{z_k(0_i)}}$$

For the rest of this article, we refer to the model of new home purchase (move and own) and the return to renting (move and rent) as the MNL model.

In estimating both models, we are concerned about one remaining issue, namely the substantive difference between voluntary and forced exits.<sup>18</sup> Because each reflects a qualitatively different pathway to renting, we are concerned about confusing predictors of voluntary and forced exit.<sup>19</sup> We define *forced exit* to include borrowers who moved out of the CAP home

<sup>18</sup>We also suspected that homeowners' moves within the current metropolitan statistical area (MSA) might qualitatively differ from moves between MSAs. In the attempt to test for this type of heterogeneity, we included an indicator for moves to a different MSA. We also tested for the potential for interactions between inter-MSA moves and relevant covariates. In all cases, the variable showed no impact on either outcome, and we exclude it from the results presented in this article.

<sup>19</sup>The CAP survey directly asks respondents what their primary reason for moving was. Additionally, we directly observe whether or not each respondent experienced a 90-day delinquency. Nearly half of the borrowers who returned to renting either defaulted (reached 90-day delinquency) or reported their inability to afford the home as the primary reason for moving. The remaining half commonly reported job change or geographic relocation as the primary reason for moving. The qualitatively different nature of these two paths to return to renting convinced us to separated voluntary from forced moves in the analysis.

after experiencing a 90-day delinquency and borrowers who reported that the inability to afford the home was their most important reason for moving. To address this concern, we estimate each model both on the full sample and on a sample that excludes borrowers forced to exit homeownership. While much previous empirical work examines the predictors of default and foreclosure,<sup>20</sup> the examination of mobility and tenure choice among this latter sample isolates the determinants of voluntary mobility.<sup>21</sup> The tenure equation, in particular, is expected to be sensitive to the exclusion of forced exit, since households experiencing default or the inability to afford their CAP home may face limited mortgage options for buying a new home.

Separation of voluntary and forced exits is particularly relevant to understanding the homeownership experiences of low-income and minority homeowners. Studies of default behavior consistently find that these borrowers have a higher incidence of default (Berkovec et al. 1998; Deng, Quigley, and Van Order 1996). Further, an emerging strand of the literature suggests that they may also have lower prepayment rates, an outcome that includes mobility (Deng and Gabriel 2006; Ratcliffe et al. 2007; Van Order and Zorn 2002).<sup>22</sup> To the extent that default and prepayment are associated with income and race/ethnicity, the factors associated with mobility and tenure choice may vary between homeowners who move voluntarily and those who are forced to do so. Keeping these caveats in mind, we turn to a discussion of the data and the results.

### **Data: CAP**

The data used in this analysis provide information on a sample of community reinvestment mortgage borrowers whose loans were purchased by Self-Help.<sup>23</sup> With a grant from the Ford Foundation, Self-Help purchased 30-year, fixed-rate community reinvestment loans. Some of them reflect new mortgage products intended for sale to Self-Help, while others are loans

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<sup>20</sup>See Quercia et al. (2002) for an analysis of default among CAP borrowers.

<sup>21</sup>We eliminate forced exits from the sample under the assumption that a mobility decision is conditional on the household's ability to sustain the mortgage. Thus, estimation of the mobility decision among households that do not default reflects the mobility decisions of households that choose between moving and continuing to pay the mortgage.

<sup>22</sup>Prepayment rates are determined by refinancing and mobility among borrowers, with mobility driving prepayment rates during periods when interest rates are increasing.

<sup>23</sup>See Apgar and Duda (2003) for a complete discussion of CRA and its enforcement, as well as bank responses.

that the lender was otherwise unable to sell to the secondary market.<sup>24</sup> The resulting sample of community reinvestment mortgages commonly includes flexible underwriting features such as low down payments or none at all, a higher debt-to-income ratio, a waiver of private mortgage insurance, and/or a limited credit history.

Because CAP is designed as a demonstration program, the sample of CAP mortgages analyzed in this article is not representative of a national sample of borrowers (e.g., new homeowners in the PSID), but rather provides insight into the homeownership transitions of borrowers served by community reinvestment lending. The CAP analysis file consists of 2,199 borrowers whose loans were originated between September 1999 and March 2003. This sample received loans from 30 different lenders in 40 states and the District of Columbia.<sup>25</sup>

Each borrower was administered the baseline survey in 2003 and a follow-up survey in 2005. These survey data are then supplemented with three additional sources of information.

1. Loan-level characteristics including borrower's credit score at origination are provided by Self-Help.
2. Neighborhood characteristics are constructed for each borrower at the ZIP code level by using data from the 2000 census (Geolytics, Inc. 2002). These characteristics reflect the neighborhood of the original CAP home for all borrowers.
3. Appreciated values estimated by Fannie Mae for each home in the first quarter of 2006 are used. Fannie Mae's proprietary automated valuation model (AVM) produces four different estimates of each home's appreciated value based on repeat sales information, public tax records, and property characteristics.<sup>26</sup> When there are discrepancies among the estimates, a reconciliation model generates the final estimate.

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<sup>24</sup>Many CAP loans contain flexible characteristics that do not conform to the requirements of secondary market purchasers. As a result, many of the early CAP purchases were of community reinvestment mortgages held in the portfolios of participating lenders, with commitments on the part of lenders to reinvest the purchase amount in similar products.

<sup>25</sup>For greater detail on the characteristics of these loans, see Quercia et al. (2002) for an analysis of the loan performance characteristics of the CAP portfolio. Additionally, Stegman et al. (2007) describe the servicing arrangements for CAP loans in detail, analyzing variation in preventive servicing strategies and outcomes across servicers.

<sup>26</sup>Because of its proprietary nature, we do not directly observe the estimation procedure used by the AVM. We base our trust in the model's reliability on consistent approval by the Office of Federal Housing Enterprise Oversight in regulatory audits.

Table 1 groups the variables chosen to define the vectors shown in equations (1) and (2) and reports the mean value of each. While these variables generally correspond to the descriptions of the variable vectors in the previous section, three measures merit comment. We include the value of the home at origination and an updated loan-to-value ratio (LTV) for the home that corresponds to the Fannie Mae estimates described for the first quarter of 2006. These variables approximate the borrower's wealth and the presence of a wealth constraint, respectively. We also include the borrower's credit score at origination to capture differences in the costs of financing a new home among movers.<sup>27</sup>

Our analysis uses both a continuous measure and a dichotomous measure of household income. The latter identifies households earning less than the median CAP household income of \$37,000.<sup>28</sup> This measure is coded 1 if the household income is less than \$37,000 and zero if the income is equal to or greater than \$37,000. High rates of mobility among young professionals and college graduates may inflate the mobility rates observed among low-income households if young professionals are grouped with households with permanently low incomes (Haurin and Rosenthal 2005; Reid 2005).<sup>29</sup> Comparing the characteristics of low-income and high-income borrowers in the CAP sample suggests that this is not the case in the CAP sample. Lower-income borrowers in the CAP sample are substantially older than the higher-income borrowers (38 on average, compared with 33), and the higher-income borrowers are also more likely to have completed postsecondary education. Because our sample contains only borrowers who receive community reinvestment mortgages, the exclusion of high-income and wealthy homeowners may explain the relative concentration of younger households in the top half of the income distribution.

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<sup>27</sup>Ideally, we would include borrower wealth and the user cost of housing options, but we do not directly observe either variable. With respect to wealth, it is likely that the CAP sample contains little variation, since these mortgage products carry low down payments to meet the needs of borrowers who do not have enough assets to make a 20 percent down payment. For this reason, the updated LTV may closely reflect household wealth.

<sup>28</sup>We also tested specifications of the income variable in which income was defined as a percentage of area median income and find that that the observed patterns of mobility and tenure choice are similar for both definitions of the income variable.

<sup>29</sup>Young professionals and college graduates are likely to have low incomes in the current period but high earnings potential in later years. Several authors have addressed this issue by estimating permanent income (see Quercia, McCarthy, and Wachter 2003; Wachter and Megbolugbe 1992). However, we choose to use the observed CAP data, since descriptive comparison of the high- and low-income groups shows that young professionals and college graduates tend to be correctly grouped with the higher-income households in the CAP sample.

**Table 1.** Descriptive Means for CAP Households by Race/Ethnicity and Income

	All	White	Black	Hispanic	High Income	Low Income
<b>Race/ethnicity and income</b>						
White	0.64	1.00	0.00	0.00	0.71	0.58
Black	0.19	0.00	1.00	0.00	0.17	0.22
Hispanic	0.13	0.00	0.00	1.00	0.09	0.16
Other race/ethnicity	0.04	0.00	0.00	0.00	0.03	0.04
Household income	\$40,053	\$42,191	\$36,230	\$35,327	\$53,999	\$25,943
<b>Static demographic characteristics</b>						
Borrower age	35.2	33.6	39.8	36.0	32.7	37.7
Male	0.51	0.54	0.27	0.70	0.58	0.44
Married/partnered	0.57	0.59	0.34	0.80	0.69	0.44
Divorced/separated/widowed	0.21	0.20	0.29	0.10	0.12	0.29
Single	0.23	0.22	0.37	0.10	0.19	0.26
<b>Whether there are children in the household</b>						
the household	0.43	0.40	0.44	0.53	0.40	0.46
Previous homeowner	0.10	0.11	0.08	0.06	0.09	0.11
Home value at origination	\$81,745	\$78,705	\$81,495	\$97,673	\$91,842	\$71,529
LTV, first quarter of 2006	0.75	0.77	0.76	0.62	0.75	0.74
Credit score	676.3	686.4	646.6	672.9	679.1	673.4
<b>Dynamic demographic variables</b>						
Added a household member	0.40	0.41	0.32	0.47	0.43	0.37
Got married/partnered	0.11	0.13	0.08	0.08	0.14	0.09
Got divorced/separated/widowed	0.04	0.03	0.06	0.03	0.03	0.04
Experienced unemployment	0.16	0.16	0.13	0.22	0.12	0.19
Changed jobs	0.17	0.18	0.13	0.15	0.19	0.15
<b>Location</b>						
Percentage of homeowners in the ZIP code	68.3	71.0	62.0	65.1	70.0	66.6
Percent minority in the ZIP code	28.0	16.7	60.7	36.1	25.3	30.8
ZIP median income/MSA median income	95.0	99.7	83.7	89.5	100.0	89.9
<b>Quarter of origination</b>						
Quarter of CAP loan origination	3rd, 2001	3rd, 2001	2nd, 2001	4th, 2001	3rd, 2001	3rd, 2001
N	2,199	1,417	425	279	1,106	1,093

MSA = metropolitan statistical area.

### Who receives community reinvestment mortgages?

Table 1 presents the mean values of each covariate for all CAP borrowers, followed by the mean values for white, black, and Hispanic borrowers and for borrowers with above- and below-median incomes. The comparison of higher- and lower-income borrowers suggests that the cohort of higher-income borrowers may include a group of younger households. The higher-income households tend to be substantially younger, more likely to be married at origination, less likely to be divorced or become divorced, and more likely to add a household member after buying the home. The higher-income households, despite their younger age, were also more likely to purchase their original CAP home in neighborhoods with higher homeownership rates and higher average incomes.

Similar patterns play out in the comparison of borrowers by race/ethnicity. The white borrowers in our sample were substantially younger and had higher incomes and credit scores than either black or Hispanic borrowers. Further, compared with black borrowers, white borrowers were more likely to be married and to add a household member, although they were less likely than Hispanic borrowers to be married or to add a member. These broad comparisons offer some insight into the households reached by community reinvestment mortgages and are consistent with later entry into homeownership among low-income and minority borrowers.

Table 2 further contextualizes the sample of CAP borrowers with reference to a sample of new homeowners from the PSID. To construct a comparison group, we identified PSID households that purchased a home between 2000 and 2003 and limited this sample to households that originated mortgages to finance this purchase.<sup>30</sup> We then used the family-level weights to approximate a nationally representative sample.<sup>31</sup> The figures in table 2 show that the CAP program disproportionately serves lower-income and minority home buyers: 32 percent of the CAP sample is composed of black and Hispanic homeowners, compared with 12 percent of the PSID sample. Similarly, the median income in the CAP sample is \$37,000, compared with

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<sup>30</sup>In each year of the PSID data, between 70 and 75 percent of households that moved into an owned home financed the purchase with a mortgage. Because all CAP homeowners relied on mortgage financing, we limit the PSID sample to the set of movers with a mortgage.

<sup>31</sup>The family-level weights can be used to approximate a nationally representative sample for observations at the household level.

**Table 2.** Descriptive Comparison of New Homeowners in the CAP and the PSID

	CAP	PSID	PSID Low Income
White	0.64	0.84	0.80
Black	0.19	0.08	0.09
Hispanic	0.13	0.04	0.08
Other race/ethnicity	0.04	0.04	0.04
Median income	\$37,000	\$63,000	\$39,810
High school degree or less	0.27	0.33	0.41
Some postsecondary	0.46	0.24	0.26
College degree	0.26	0.40	0.22
Age	35.2	39.8	38.0
Married	NA	0.67	0.52
Married/partnered	0.57	NA	NA
Divorced/separated/widowed	0.21	0.16	0.26
Never married	NA	0.17	0.22
Single	0.23	NA	NA
Whether there are children in the household	0.43	0.47	0.44
Median initial home value*	\$77,000	\$152,000	\$138,700
Median initial mortgage balance*	\$73,700	\$119,000	\$101,100
Median initial LTV*	0.97	0.79	0.80
N	2,199	842	421

\* The initial values for PSID households are recorded at the time of the first interview after the household enters homeownership. For CAP borrowers, they correspond to loan origination.

NA = not available.

\$63,000 in the PSID sample. Comparisons of home values and mortgage balances reinforce the supposition that CAP households purchase more modest homes and make smaller down payments.<sup>32</sup>

In later analyses, we also compare CAP households with the set of low-income households in the PSID sample, defined as households with incomes below the median for the sample. The characteristics of this group are reported in the last column of table 2. While the income levels of this group more closely approximate those of CAP households, there are still notable differences between this sample and the set of CAP households served by community reinvestment mortgages.

<sup>32</sup>The timing of data collection may contribute to these gaps, since the figures for CAP households reflect origination, whereas PSID households self-reported home values and outstanding mortgage balances at the first interview after home purchase (up to two years later). However, interview timing alone does not explain the full size of the gaps in home values and down payment amounts.

## **Mobility and tenure choice among low-income and minority borrowers**

Of the 2,199 borrowers, 371 (17%) moved before the third wave of interviews in 2006. Of this set of movers, 265 (71%) purchased a new home and 106 (29%) returned to renting. Equivalently, 12.1 percent of all respondents purchased a new home and 4.8 percent returned to renting. To attempt to benchmark these mobility rates, we compare these frequencies with those for homeowners in the PSID. Using the PSID sample of new homeowners described in the previous paragraph, we followed new home buyers through the 2005 survey and identified any households that purchased a new home or returned to renting. Of the 842 households that entered homeownership between 2000 and 2003, 36 percent moved before the 2005 survey; of these, just under 80 percent purchased a new home.<sup>33</sup>

Comparison with the PSID also offers insight into the extent to which community reinvestment mortgage borrowers exhibit the patterns of homeownership exit documented in previous studies.<sup>34</sup> Table 3 shows the percentage of borrowers who move and who purchase a new home (conditional on moving). It then displays the joint percentages for moving and owning and moving and renting. The first column shows these frequencies among households in the CAP sample. The second displays these figures after excluding forced movers. The third displays the comparable figures for the PSID sample, and the fourth shows these frequencies for PSID households whose incomes are below the median observed for new homeowners in the PSID.<sup>35</sup>

Several comparisons of the frequencies in table 3 are relevant to the homeownership experiences of low-income and minority borrowers. First, the relative frequencies for the PSID are consistent with the findings of other studies that low-income (Reid 2005) and minority (Boehm and Schlottman 2004; Haurin and Rosenthal 2004) households in the PSID are less likely

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<sup>33</sup>To correct for the sample design, we use household weights to adjust all frequencies to be representative of the larger population. For this reason, we do not present a number of movers or owners.

<sup>34</sup>We construct an updated PSID sample that corresponds to the CAP time period, since previous studies examine homeownership exit during the 1980s and early 1990s. The updated PSID sample exhibits patterns similar to those documented by previous studies (e.g., low-income and minority homeowners are less likely to purchase a new home and more likely to return to renting).

<sup>35</sup>In comparing the PSID and CAP samples, we examined multiple subsets of the PSID data set and multiple constructions of the low-income variable (see footnote 28). The patterns of mobility and tenure choice are replicated across these alternative samples and definitions of the income variable.

**Table 3.** Mobility and Tenure Choice Frequencies by Income and Race/Ethnicity

	Full CAP Sample	CAP Sample Excluding Defaults	PSID	PSID Low Income
<b>Move (%)</b>				
Above median income	19.7	17.9	35.8	39.3
Below median income	14.0	10.3	35.8	33.2
White	19.8	17.5	35.8	36.6
Black	10.4	5.2	30.0	31.7
Hispanic	12.9	11.6	48.2	50.4
<b>Own* (%)</b>				
Above median income	77.1	86.1	86.5	70.2
Below median income	63.4	75.9	71.8	71.3
White	72.9	81.3	81.1	72.2
Black	54.5	90.5	68.8	46.3
Hispanic	83.3	87.5	68.2	73.0
<b>Move and own (%)</b>				
Above median income	15.2	15.4	30.9	27.6
Below median income	8.9	7.8	25.7	23.7
White	14.4	14.2	29.0	26.4
Black	5.6	4.7	20.6	14.7
Hispanic	10.8	10.2	32.9	36.8
<b>Move and rent (%)</b>				
Above median income	4.5	2.5	4.8	11.7
Below median income	5.1	2.5	10.1	9.5
White	5.4	3.3	6.8	10.2
Black	4.7	0.5	9.4	17.1
Hispanic	2.2	1.5	15.3	13.6
<b>N</b>	2,199	2,130	842	421

*Note:* Frequencies reflect the percentage of CAP households that move, own (conditional on moving), move and own, and move and rent, respectively.

\*Conditional on moving (for the full CAP sample, N = 371).

CAP: N = 782 white; 425 black; and 279 Hispanic. PSID: N = 606 white; 167 black; and 34 Hispanic. These represent a censored subset of the full data set.

to purchase a new home and more likely to exit homeownership, although the gap between low-income and high-income households is smaller than the one reported between racial/ethnic groups.<sup>36</sup> The only exception to this pattern is that Hispanic homeowners are slightly more likely to purchase a new home than white households, although this comparison is limited by the small sample of Hispanic households in the PSID (only 34 of the 841 new homeowners are Hispanic). Because these patterns may be driven by low rates of mobility among the highest-income households, we also report the rates of mobility and exit among PSID households with incomes below the median for new homeowners. The last column in table 3 shows that the same basic pattern emerges for this sample of lower-income PSID households.<sup>37</sup>

When the figures for the CAP sample are contrasted with the corresponding PSID figures, a more complex picture of the patterns of homeownership transition among low-income and minority borrowers emerges. Consistent with the PSID, the percentages of low-income, black, and Hispanic CAP households that purchase new homes (move and own) are all lower than the corresponding percentages for either high-income or white households. This pattern is consistent with the pattern for PSID households and results both from a lower incidence of mobility among low-income, black, and Hispanic households and from a lower incidence of ownership among low-income and black movers.

By contrast, black and Hispanic CAP households are less likely to return to renting than white households, a finding that directly conflicts with the patterns observed in the PSID. The mobility and tenure frequencies show that this finding results entirely from lower mobility among black homeowners and from the combination of lower mobility and higher ownership among Hispanic borrowers. The different populations reflected by the CAP and PSID samples prevent us from identifying the source of this difference.<sup>38</sup> However, the lower likelihood of a return to renting among black and Hispanic households in the CAP sample suggests that the low-income

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<sup>36</sup>To compare these figures with the CAP data set, we define high income as above the median observed in the CAP data set (\$37,000) and low-income as below this amount.

<sup>37</sup>These patterns are robust to multiple constructions of the lower-income sample for the PSID. We define the low-income indicator variable as whether the household's income is below the median observed in the PSID or below the median observed in the CAP sample. We also limit the sample to households with incomes below the highest income and the third quartile of incomes observed in the CAP. In each case, low-income and minority households in the PSID remained less likely to purchase a new home and more likely to return to renting.

<sup>38</sup>To make sure that the difference is not driven by elderly households leaving homeownership to return to renting, we excluded households over age 60. The patterns of mobility and exit are replicated for this sample.

and minority households reached by community reinvestment mortgages may have different homeownership experiences than the larger population of such homeowners. For instance, the higher concentration of predatory mortgage products among minority borrowers may contribute to the higher likelihood of a return to renting among PSID households.<sup>39</sup> While our ability to explore this possibility is limited, we can conclude that the low-income and minority households served by 30-year, fixed-rate community reinvestment mortgages do not exhibit the elevated rates of homeownership exit documented by Boehm and Schlottman (2004) and our updated figures for PSID households.

Table 3 shows that these patterns strengthen when forced moves are removed from the CAP sample. The frequencies for black homeowners are especially sensitive to distinguishing between voluntary and forced moves. When forced exits are removed, black households are substantially more likely than white households to remain homeowners after a move. Among voluntary movers, black households are also less likely to return to renting. The difference between these findings and the corresponding comparisons for the full CAP sample suggests that black households may be more likely to move because of default or the inability to afford the home, but otherwise less likely to return to renting.

### Estimation results

Estimation of the empirical model reinforces these basic findings, adding greater depth about the determinants of these differences. Table 4 presents estimation results for the selection model with respect to mobility and tenure choice. The first model reports estimates for the full CAP sample, and the second shows results when forced exits are removed. First, results for the full sample suggest that low-income, black, and Hispanic borrowers are less likely to move, but no less likely to purchase a new home when they do move. It should be emphasized that this pattern emerges among the full sample of CAP borrowers, including those who default or report the inability to afford the home. Where the percentages in table 3 show that low-income

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<sup>39</sup>A second possibility is that lower home appreciation among black and Hispanic borrowers results in lower mobility, particularly if negative appreciation prevents some households from pursuing jobs or opportunities in other areas. In documenting appreciation in the CAP sample, Stegman, Quercia, and Davis (2007) find that white, black, and Hispanic households in that sample averaged appreciation rates of 4.6 percent, 4.1 percent, and 13.1 percent, respectively. These figures only partially bear out this second possibility.

and black households that move transition into a new home less often than white households, the coefficients on both the income and minority variables suggest that these effects result entirely from reduced mobility. Neither effect is significant for the full sample, and the difference between the raw frequencies and the estimated effects from the multivariate analysis suggests that separating mobility from tenure choice is necessary to understand the relationships between race and tenure choice.

This pattern becomes stronger when borrowers reporting forced moves are removed from the sample. Low-income and black homeowners are significantly less likely to move than white homeowners, and black households are significantly more likely to own when they do move. A third observation from the selection model is that several of the estimated effects are sensitive to the exclusion of forced exits. The coefficients and *t*-statistics on the indicator variable for black households increase substantially in both the mobility and tenure choice equations. The effect of credit scores on tenure choice is equally sensitive. Where credit score significantly predicts tenure choice among the full sample, this effect disappears when forced exits are removed, suggesting that credit score acts mainly to predict default. The credit score effect, when combined with the robustness of the effect of the job change variable, offers some evidence of the two different pathways by which households return to renting. While one group of households returns to renting because of default or the inability to afford the home, the second does so to adjust to changing family and employment needs. The sensitivity of the Hispanic and black household indicator variables to the exclusion of forced exit offers some evidence to reinforce the importance of distinguishing between voluntary and forced exits.

Several of the covariates of the selection model also merit attention, particularly for the differences between the predictors of mobility and tenure choice.<sup>40</sup> Age is negatively associated with mobility, but not significantly associated with tenure choice. This result may be due to the relatively small number of CAP movers. However, it may also suggest that age does not independently affect tenure choice once homeownership is initially achieved.<sup>41</sup> The presence of children and the updated LTV are both negatively associ-

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<sup>40</sup> In specifying the model, we tested several specifications of the age variable, none of which improved on the basic inclusion of the variable.

<sup>41</sup> A third possibility is that the exclusion of higher-wealth households from the CAP sample removes a set of older households that exclusively make own-to-own transitions. In this way, younger CAP households that move may have the same levels of wealth as older movers, lessening the effect of age on tenure choice.

**Table 4.** Selection Model of Mobility and Tenure Choice

	Full Sample (N = 2,199)				Sample Excluding Forced Exits (N = 2,130)			
	Move		Own		Move		Own	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Black	-0.303*	(2.41)	0.168	(0.65)	-0.558**	(3.73)	0.920*	(2.01)
Hispanic	-0.149	(1.23)	0.497	(1.89)	-0.136	(1.06)	0.399	(1.20)
Other race/ethnicity	-0.203	(1.03)	-0.304	(0.79)	-0.302	(1.37)	-0.352	(0.66)
Household income (logged)	0.396**	(3.83)	-0.017	(0.07)	0.472**	(4.14)	-0.083	(0.23)
Borrower's age	-0.016**	(3.88)	-0.018	(1.37)	-0.020**	(4.31)	-0.015	(0.87)
Male	-0.074	(0.98)	0.224	(1.47)	-0.078	(0.95)	0.377	(1.85)
Married/partnered	-0.029	(0.31)	0.401*	(2.09)	0.068	(0.65)	0.614*	(2.23)
Divorced/separated/widowed	0.009	(0.08)	0.461	(1.78)	0.079	(1.55)	0.559	(1.55)
Whether there are kids in the household	-0.149*	(2.02)	-0.259	(1.43)	-0.177*	(2.21)	-0.098	(0.44)
Previous homeowner	0.121	(1.07)	-0.104	(0.46)	0.181	(1.48)	-0.034	(0.11)
Home value at origination (\$10,000s)	-0.032*	(2.45)	0.040	(1.39)	-0.031*	(2.16)	0.033	(0.84)
LTV, first quarter of 2006	-0.594*	(2.31)	-0.725	(1.15)	-0.837**	(3.04)	-0.063	(0.08)
Credit score lower than 580	0.100	(0.60)	-0.716*	(2.28)	-0.021	(0.10)	-0.515	(1.01)
Credit score from 581 to 619	-0.027	(0.25)	-0.075	(0.35)	-0.100	(0.80)	0.016	(0.05)
Credit score from 620 to 659	0.049	(0.59)	-0.304	(1.73)	-0.044	(0.49)	-0.304	(1.25)
Added a household member	0.315**	(4.39)	-0.247	(1.51)	0.272**	(3.48)	0.065	(0.26)
Got married/partnered	-0.161	(1.42)	0.447	(1.94)	-0.007	(0.06)	0.208	(0.73)
Got divorced/separated/widowed	-0.204	(1.01)	-0.665	(1.46)	-0.383	(1.55)	-0.388	(0.62)
Experienced unemployment	0.050	(0.54)	-0.514*	(2.44)	-0.186	(1.67)	-0.616	(1.77)
Experienced a job change	0.412**	(4.98)	-0.606**	(3.96)	0.384**	(4.32)	-0.494*	(2.40)
Percentage of homeowners in the ZIP code	-0.004	(0.01)	0.853	(0.76)	0.042	(0.07)	0.699	(0.47)
Percent minority in the ZIP code	0.131	(0.67)	-0.082	(0.20)	0.164	(0.75)	0.251	(0.42)
ZIP median income/MSA median income <sup>a</sup>	1.238**	(2.70)	0.653	(0.62)	1.562**	(3.10)	0.335	(0.23)
Percent homeowners multiplied by neighborhood income	-0.885	(1.57)	-0.928	(0.73)	-1.219*	(1.97)	-0.522	(0.31)
Constant	-4.320**	(3.80)	1.959	(0.76)	-5.092	(0.72)	1.719	(0.43)
Quarter of origination fixed effects <sup>b</sup>	—	26.41	—	17.92	—	17.92	—	17.92
Rho, chi <sup>2</sup> (df = 1) <sup>c</sup>	-0.674	1.76	-0.449	0.42	-0.449	0.42	-0.449	0.42

Note: The dashes indicate that there are no meaningful coefficients to report for these cells.

<sup>a</sup>This variable is computed as the ratio of the median income in the ZIP code and the median income for the MSA. It captures the relative income of the neighborhood. The next variable is the interaction of this measure with percentage of homeowners in the ZIP code.

<sup>b</sup>This variable reflects the quarter of origination fixed effects. As a result, no individual coefficient is reported, and the test of significance is an *F*-test of joint significance for the 13 fixed effects.

<sup>c</sup>The coefficient on Rho is reported directly, along with the test statistic for the independence of equations. The reported significance therefore corresponds to the null hypothesis that  $p = 0$ .

MSA = metropolitan statistical area.

\* $p < 0.05$ . \*\* $p < 0.01$ .

ated with mobility. Conversely, adding a household member and changing jobs increase the likelihood of moving. In the tenure choice equation, being married/partnered and getting married/partnered increase the likelihood of owning, while low credit scores, unemployment, and job change decrease the likelihood.

Beyond the static and dynamic household characteristics, location of the CAP house also determines mobility. Borrowers in higher-income neighborhoods are more likely to move, although this effect is partially moderated by the interaction of neighborhood income with the neighborhood homeownership rate. More precisely, borrowers in higher-income neighborhoods with lower homeownership rates are most likely to move.

When combined with the predictive power of age, household growth, and job change, the location effect suggests that much of the observed upward mobility occurs as young households move from starter homes into more stable neighborhoods. This image is consistent with the general pattern of positive progress up the housing ladder over the life cycle. If low-income and minority households are less likely to receive assistance in making a down payment and therefore enter homeownership at a later age, the lower likelihood of mobility among these groups may result only from differences in life-cycle stages. In this sample of community reinvestment borrowers, the average age of white homeowners is 34, compared with 36 and 40 for Hispanic and black homeowners, respectively. The relatively small number of CAP movers limits our ability to empirically measure the contribution of age to observed differences in mobility. However, our findings suggest that differences in the age of homeownership entry by race/ethnicity and income level may be important to understanding mobility patterns. To the extent that age affects mobility rates, these differences may also have implications for the economic benefits captured by households entering homeownership at different stages of the life cycle.

Table 5 presents results from the MNL model in which the outcome measures are specified as the purchase of a new home (move and own) and the return to renting (move and rent). These outcomes are analogous to the transitions out of homeownership used in previous studies. Table 5 presents the results for this model first for the full sample and then for the sample that excludes forced exits.

Table 5 shows that the effect of mobility dominates the coefficients for low-income and minority homeowners. The first model shows that income significantly predicts whether a household purchases a new home, with the indicator variable for black households nearing significance. These results strengthen when forced exits are removed, with low-income and black

**Table 5.** Multinomial Logit Model of Move and Own versus Move and Rent

	Full Sample (N = 2,199)				Sample Excluding Forced Exits (N = 2,130)			
	Move and Own		Move and Rent		Move and Own		Move and Rent	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Black	-0.554	(1.93)	-0.653	(1.74)	-0.785*	(2.51)	-2.321**	(2.74)
Hispanic	-0.050	(0.20)	-0.867	(1.86)	-0.145	(0.56)	-0.708	(1.20)
Other race/ethnicity	-0.414	(0.96)	-0.029	(0.05)	-0.564	(1.22)	-0.168	(0.22)
Household income (logged)	0.766**	(3.49)	0.459	(1.48)	0.841**	(3.69)	0.700	(1.53)
Borrower age	-0.052**	(5.13)	0.005	(0.42)	-0.052**	(4.86)	-0.005	(0.28)
Male	-0.077	(0.50)	-0.266	(1.12)	-0.090	(0.57)	-0.359	(1.13)
Married/partnered	0.225	(1.13)	-0.707*	(2.45)	0.326	(1.56)	-0.746	(1.88)
Divorced/separated/widowed	0.296	(1.11)	-0.448	(1.36)	0.270	(0.95)	-0.319	(0.68)
Whether there are children in the household	-0.460**	(2.95)	0.158	(0.70)	-0.393*	(2.44)	-0.121	(0.36)
Previous homeowner	0.312	(1.29)	0.202	(0.58)	0.367	(1.49)	0.325	(0.69)
Origination home value (\$10,000s)	-0.039	(1.49)	-0.098*	(2.12)	-0.042	(1.54)	-0.107	(1.71)
LTV, 1st quarter of 2006	-1.505**	(2.89)	0.194	(0.22)	-1.597**	(2.98)	-1.236	(1.12)
Credit score lower than 580	-0.182	(0.44)	0.790*	(1.97)	-0.162	(0.37)	0.842	(1.05)
Credit score from 581 to 619	-0.157	(0.67)	0.181	(0.57)	-0.178	(0.72)	-0.161	(0.28)
Credit score from 620 to 659	-0.189	(1.06)	0.522*	(2.16)	-0.265	(1.42)	0.350	(1.04)
Added a household member	0.511**	(3.44)	0.770**	(3.49)	0.499**	(3.26)	0.553	(1.76)
Got married/partnered	-0.114	(0.50)	-0.798*	(2.04)	0.039	(0.17)	-0.267	(0.56)
Got divorced/separated/widowed	-1.098	(1.80)	0.479	(1.03)	-1.001	(1.64)	0.136	(0.18)
Experienced unemployment	-0.277	(1.27)	0.676**	(2.70)	-0.579*	(2.33)	0.344	(0.91)
Experienced a job change	0.481**	(2.87)	1.251**	(5.40)	0.544**	(3.19)	1.211**	(3.85)
Percentage of homeowners in the ZIP code	0.082	(0.07)	-0.270	(0.17)	0.126	(0.11)	-0.203	(0.09)
Percent minority in the ZIP code	0.138	(0.32)	0.399	(0.70)	0.325	(0.74)	0.294	(0.32)
ZIP median income/MSA median income <sup>a</sup>	2.806**	(2.91)	0.814	(0.56)	2.980**	(2.99)	2.364	(1.21)
Percent homeowners multiplied by neighborhood income	-2.068	(1.73)	-0.373	(0.21)	-2.249	(1.82)	-2.012	(0.82)
Constant	-7.884**	(3.23)	-7.809*	(2.27)	-8.980**	(3.52)	-9.325	(1.85)
Quantifier of origination fixed effects <sup>b</sup>	—**	27.72	—	10.03	—	19.94	—	10.75
Pseudo-R <sup>2</sup>	.12		.14		.14			

Note: The dashes indicate that there are no meaningful coefficients to report for these cells.

<sup>a</sup>This variable is computed as the ratio of the median income in the ZIP code and the median income for the MSA. It captures the relative income of the neighborhood. The next variable is the interaction of this measure with percentage of homeowners in the ZIP code.

<sup>b</sup>This variable reflects the quarter of origination fixed effects. As a result, no individual coefficient is reported, and the test of significance is an F-test of joint significance for the 13 fixed effects. MSA = metropolitan statistical area.

\*  $p < 0.05$ . \*\*  $p < 0.01$ .

households significantly less likely to purchase a new home. These findings have two implications for the existing literature on the transition out of homeownership.

1. Lower mobility among low-income and minority households dominates the findings in the homeownership transitions model, obscuring the results with respect to the tenure decision. This finding reinforces our earlier concerns over the specification of new home purchase and the return to renting as the outcome for multivariate analysis.
2. The patterns of homeownership exit among CAP households differ from those documented for the larger population of homeowners. The results of the MNL model show that low-income and minority households are no more likely to return to renting than other households. In fact, black households are significantly less likely to return to renting once forced exits are removed. The coefficients on the income and minority variables in other equations are consistent with the lower likelihood of a return to renting among low-income and minority households, although the effects do not reach significance.

The results from the selection model suggest that the negative coefficients result entirely from reduced mobility among these groups. Both the lower frequencies in table 3 and the negative coefficients on the low-income and minority variables directly contradict the patterns found among PSID households (Boehm and Schlottman 2004; Haurin and Rosenthal 2004; Reid 2005). Unfortunately, we cannot say much about the drivers of these differences, other than that they likely result from differences between the CAP sample of community reinvestment loans and the larger population of homeowners reflected by the PSID sample. The lack of information in the PSID on mortgage default and the mortgage product itself prevents us from further examining the possibility of heterogeneous experiences among low-income and minority homeowners.

## Conclusion

This study analyzed the transitions out of homeownership among a sample of community reinvestment mortgage borrowers, focusing on the relative experiences of low-income and minority borrowers. Several recent studies have indicated the importance of assessing the relative ability of low-income and minority homeowners to sustain homeownership once it is achieved, showing that these households are more likely to exit homeownership and return to renting (Boehm and Schlottman 2004; Haurin and Rosenthal 2004;

Reid 2005). Our study offers evidence that these patterns are not consistent across all mortgage types. Specifically, the analysis shows that low-income and minority households with community reinvestment mortgage products are no more likely than other households to exit homeownership and return to renting.

Moreover, multivariate analyses confirm that low-income and minority borrowers are less likely than high-income and white borrowers to move and are no less likely to purchase a new home when they do move. These patterns directly conflict with those documented for the larger population of homeowners, suggesting that the relative frequencies of homeownership exit may differ across different types of mortgage products.

These results raise important questions about the factors driving the adverse experiences of low-income and minority borrowers in the larger population. Is homeownership exit concentrated among borrowers with high-priced mortgages? To what extent do the increased levels of default associated with subprime lending contribute to these patterns? Further research should examine the consistency of these patterns across different types of mortgage products to document the economic consequences of homeownership exit. The CAP data set limits our ability to fully explore the potential sources of sustained homeownership among CAP borrowers, and we must emphasize that these differences may come from multiple sources. For instance, the low-income and minority households in the CAP sample entered homeownership at later stages of life and were less likely to report changing jobs.<sup>42</sup> Conversely, these households may perceive larger obstacles to reentering homeownership and therefore be more wary of a return to renting. Future analyses should explore both types of potential influences.<sup>43</sup>

The current movement toward segmentation of the mortgage market and differentiation of mortgage products and terms makes evaluation of different types of products complex. The lack of widely available public data on mortgage prices and loan outcomes further limits the ability of outside analysts to answer important questions about the value of different types

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<sup>42</sup>The findings reported are robust to alternative specifications of the age variable.

<sup>43</sup>Black households in the CAP sample experience lower appreciation than white households do (Stegman, Quercia, and Davis (2007)). However, table 1 shows that low-income and minority households hold lower LTVs than high-income and white households, thus indicating greater relative equity stores. Given these characteristics, the lower credit scores observed among low-income and minority borrowers may offer the most plausible constraint to reentering homeownership.

of products in expanding homeownership and creating wealth among low-income and minority populations. Nevertheless, the rates of homeownership exit associated with the CAP and PSID samples suggest that the economic benefits of homeownership differ widely both across individual homeowners and between groups of homeowners and that community reinvestment lending can be done in a way that creates sustained homeownership among low-income and minority buyers. Expanded data reporting and analysis are needed to better understand the implications of recent changes in the mortgage market for the ability of federal policy tools to extend the full benefits of homeownership to traditionally underserved populations.

### *Appendix*

#### *Comparison of CAP borrowers with Federal Housing Administration (FHA) and Fannie Mae or Freddie Mac*

The description of the CAP data set offers insight into the population of community reinvestment mortgages. We also supplement this description here with a comparison to the set of FHA loans and the set of loans purchased by Fannie Mae and Freddie Mac in 2000. In general, the CAP sample includes a higher proportion of loans to low-income and black homeowners and loans in low-income and minority neighborhoods. Table A.1 compares CAP mortgages with FHA mortgages and government-sponsored enterprise (GSE) purchases with respect to both borrower and neighborhood characteristics (U.S. Department of Housing and Urban Development [HUD], Office of Policy Development and Research 2002).<sup>44</sup> Comparing the percentages in table 6 suggests that the CAP portfolio is most comparable to the population served by FHA loans. Almost 60 percent of CAP borrowers have incomes that are less than or equal to 80 percent of the area median, compared with almost 50 percent of FHA loans and 26 percent of GSE loans. The CAP portfolio also includes a larger percentage of black borrowers and borrowers in each type of targeted neighborhood. The CAP portfolio lags FHA in the share of loans to Hispanic and minority borrowers, but this difference likely results from relatively less CAP purchasing from lenders in the West.

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<sup>44</sup>The figures for GSE and FHA loans are reported by HUD (2002) for 2000.

**Table A.1** Comparison of CAP with FHA and GSE Home Purchase Loans

	CAP Percentage of Loans	Fannie Mae/ Freddie Mac Percentage of Loans	FHA Percentage of Loans
<b>Borrowers</b>			
Low income <sup>a</sup>	59.7	25.9	48.7
Black	19.3	4.2	15.5
Hispanic	12.7	7.3	20.7
Minority <sup>b</sup>	35.6	18.9	40.2
<b>Tract</b>			
Low income	43.7	9.4	19.2
High minority	38.9	14.1	26.5
High black	22.9	3.7	9.4

*Note:* The figures for FHA loan originations are derived from Home Mortgage Disclosure Act data and reported by HUD for 2000. The corresponding figures for Fannie Mae and Freddie Mac reflect loans purchased in 2000 as given in loan-level data reported by the GSEs to HUD (HUD 2002).

<sup>a</sup> We adopt the definitions of low-income and minority borrowers and tracts used in HUD (2002). Each cell reports the percentage of a sector's originations/purchases accounted for by the borrower or tract characteristics.

<sup>b</sup> Minority is defined to include all borrowers reporting black, Hispanic, and other nonwhite race or ethnicity.

### *Authors*

Jonathan S. Spader is a doctoral candidate in the Department of Public Policy at the University of North Carolina at Chapel Hill. Roberto G. Quercia is director of the Center for Community Capital at the University of North Carolina at Chapel Hill and a professor in the Department of City and Regional Planning.

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