# Are Investors the Bad Guys? Tenure and Neighborhood Stability in Chelsea, Massachusetts

Lynn M. Fisher
Associate Professor
University of North Carolina
Lynn_Fisher@unc.edu

Lauren Lambie-Hanson
Massachusetts Institute of Technology,
and Federal Reserve Bank of Boston
lslh@mit.edu

Draft: December 2010

**Abstract**

In this paper we examine the role of investors and occupant-owners in an urban context during the recent housing crisis. We focus on Chelsea, Massachusetts because it is a dense city, dominated by multifamily housing structures with high rates of foreclosure for which we have particularly good data. We distinguish between owner-occupiers and investors using local data, and find that that many investors are misclassified as occupant-owners in the HMDA data. Then, employing a competing risks framework to study ownerships during the period 1998 through mid-2010, we find that local investors, who tend to invest more in relation to purchase prices and sell more quickly, experienced approximately 1.8 times the foreclosure risk of occupant-owners, conditional on financing. Non-local investors have no statistically significant difference in foreclosure risk from occupant-owners. Nonetheless, those owners with subprime purchase mortgages (most of whom are occupant-owners) faced the highest foreclosure risk when house prices fell.

## Introduction

In response to the foreclosure crisis of the last few years, government agencies have been challenged with introducing programs and policies to stabilize neighborhoods. An important policy choice is whether to pursue subsidies and other incentives that encourage one type of tenure over another. Beyond the immediate crisis, current tenure choices will have long-term impacts on communities. *Stability* is a word often associated with homeownership, and a review of the extant literature suggests that both theoretical and empirical work focus on the different behavior of occupants, that is, between owner-occupiers and renters. On the other hand, we find very little evidence about the role of investor-owners in promoting or upsetting neighborhood stability with the exception of work on investment behavior. Recent attention to the role of "flippers" and speculators in the context of the housing crisis suggests that it is important to consider evidence about outcomes associated with owners and not just the occupants of housing. The question of desirable ownership patterns is especially interesting in urban locations with a mix of housing structures and historically higher levels of investor ownership as compared to the suburbs.

In this paper we explore differences between occupant-owners and investor-owners in a particular urban community with respect to three possible, but certainly not exhaustive, mechanisms expected to impact neighborhoods. To the extent that investors are associated with greater turnover, more foreclosures, or lower levels of investment, investor-ownership may negatively impact neighborhoods and skepticism about the role of investors in helping to stabilize residential neighborhoods may be well-founded. On the other hand, it may be that investors are an important part of the fabric of some neighborhoods and not a threat to it. This

distinction is important since investors may wield a potentially important source of capital for reinvestment in neighborhoods struck hard by foreclosures.

Therefore, we investigate whether there is systematic variation in the rates of turnover, foreclosure or investment between occupant-owners and investors in Chelsea, Massachusetts during the period 1998-2010. We focus on Chelsea because it is a dense city near Boston, dominated by small multifamily housing structures that are likely to attract investors, and it has been hard struck by the foreclosure crisis. Our small geographic focus helps us assemble a rich dataset to address tenure questions. To date, researchers have been limited by data constraints in identifying whether owners are investors, as there is no natural place for such data to be collected.[1]

We expand upon the comprehensive data of Gerardi and Willen (2009) by matching property addresses with owner addresses found in local tax assessor records and identify investors as owners who receive their tax bill at a physical address other than that of the unit or building in question. We are able to compare our tenure classification against the Home Mortgage Disclosure Act (HMDA) investor indicator and find that many investors are misclassified as occupant-owners in the HMDA data. We also assemble data on building permits issued between 1998 and 2010 for our sample of single and multi-family properties, which allow us to investigate investment activity over the housing cycle.

In our analysis, we distinguish between local and non-local housing investors. Policy-makers and community leaders often differentiate between local investors and non-local investors,

presumably because investors who live near their investments may behave differently than truly absentee landlords. In particular, local investors may face different incentives to invest or default than non-local investors. In addition, local investors may also have better information about the local market.

The finance literature which investigates "home bias" in investing, for example, suggests that local investors may be associated with both positive and negative outcomes for the local firms in which they invest. Gaspar and Massa (2007) find that local investors have better information and provide improved governance of local firms (which are associated with better performance). On the other hand, less informed (non-local) investors may demand a premium to buy the locally-held firm rendering stocks less liquid and offsetting the price-increasing benefits of better governance (Gaspar and Massa 2007). In a different context, Seasholes and Zhu (2010) find no evidence that local (individual) investors possess better information than non-local investors based on the performance of stocks that they purchase and sell. Indeed, local investors may simply be more familiar with firms in closer proximity and may naively invest close to home, ignoring the benefits of looking further afield (Huberman 2001). Given these competing theories, the impact of local versus non-local investor ownership on individual houses and on neighborhoods is an interesting empirical question.

We utilize a competing risks framework to study the likelihood of foreclosure and non-foreclosure sales conditional on a variety of factors between 1996 to mid-2010. We find that investors have shorter holding periods as compared to occupant-owners. Unsurprisingly, ownerships that use subprime mortgages are initially 7 times as likely to experience foreclosure

as compared to owners using non-subprime mortgages or no mortgage at all. Conditional on the fact that investors and occupant-owners utilized subprime loans at different rates, we find that *local* investors were 1.8 times more likely to enter foreclosure than occupant-owners. Non-local investors did not significantly differ from occupant-owners' likelihood of foreclosure.

In separate analysis, we show that among building permits for 1-3 family homes, local investors proposed greater investment relative to purchase price as compared to occupant-owners and non-local investors. Combined with the fact that non-local investors are more likely to invest in 2-3 family homes, our findings suggest that local investors have pursued riskier investment strategies in Chelsea. These strategies may have benefited neighborhoods, by virtue of greater investment in the short run, while resulting in a reduction in stability over time due to increased exposure to housing market shocks. Regardless, the magnitude of the local-investor impact on foreclosure hazards is much less than that associated with the use of subprime mortgages which were used more frequently and in greater numbers by homeowners.

In many ways, our results are not surprising. We expect that homeowners, local investors and outsiders have different motivations and information and face different underwriting and investment criteria, leading to substantially different housing market decisions. Nonetheless, we contend that there is little empirical evidence linking housing owners to specific market outcomes and that important policy decisions are being made in the absence of such information. While more research is surely needed to evaluate the neighborhood impacts of housing turnover, foreclosure and property investment, this paper takes a first look at how different types of owners have fared during the housing crisis in a particular city, and why.

**Background and Literature Review**

Rohe and Stewart (1996) find that evidence in the housing literature links homeownership and neighborhood health or stability in four main ways: through length of occupant tenure, property values, physical condition of properties and social conditions. Their literature review also highlights the fact that much of this literature focuses on differences in occupants, that is, differences in renters and homeowners. In this paper, we do not focus a comparison of renters and homeowners, rather we compare behavior of investors (non-occupants) and homeowners. This is due in part to widespread interest in how investors, flippers and/or speculators behaved during the height of the housing boom, as well as current policy interest in the transfer of foreclosed homes to new owners. Thus we do not directly address the behavior of renters or related social outcomes in this study, although they are clearly important. Nor do we investigate the impact of tenure on house prices given a growing literature which already studies this issue (see Coulson, Hwang, and Imai 2003 for a review, and recent work on house prices in the foreclosure crisis, for example Immergluck and Smith 2005, Schuetz et al. 2008, Lin et al. 2009, Rogers and Winter 2009, Campbell et al. 2009, and Harding et al. 2009). We focus instead on differences in the length of ownership periods, investment and foreclosure by tenure. In this section, we briefly review the literature that touches on tenure with respect to these three mechanisms.

Less turnover is often described as a social benefit of homeownership (Dietz, 2003; Rohe et al., 2002; Rohe and Stewart 1996), but this benefit is most often investigated in terms of occupants

(namely homeowners and renters), not with respect to ownership periods (by investors and homeowners). With respect to the length of investor versus homeowner ownerships, we find no empirical evidence of differences in the literature. We speculate that if investors have shorter investment horizons, they may have objectives that differ from their longer-term neighbors, for example, in terms of investment in public goods or civic participation. This tension may result in challenges to neighborhood stability.

Other negative connotations associated with quick turnover are due to recent evidence that investors who "flipped" properties sometimes committed fraud, engaging in superficial fix-ups and then lying about housing quality to buyers (Lefcoe 2009). Quick turnover is also a key ingredient in speculation, which for a variety of reasons may instigate or exacerbate real estate cycles, particularly when housing supply is inelastic (Malpezzi and Wachter 2005).

Several recent studies have discussed the role of investor-owners in the current wave of foreclosures. Many of the articles that address tenure focus on the displacement of renters. Wardrip and Pelletiere (2008) use data on property types (single family, 2-5 family, etc.) to estimate the number of renters impacted by foreclosure. Been and Glashausser (2009) offer an extensive account of the various ways in which renters can be harmed by predatory landlords and mortgage servicers. Unfortunately, there is little conclusive evidence on investors' risk of foreclosure, relative to occupant-owners.

There are several reasons why investors are perceived as having higher risk of foreclosure. First, because they do not live in their properties, they are commonly assumed to have fewer personal

ties with the properties and the neighborhoods, making them more willing to walk away if it becomes difficult to make payments (Gerardi et al. 2007). Second, due to their profit-motivation, highly-leveraged investors should be more likely to "ruthlessly default" on mortgages if house prices fall, leaving them with negative equity (Greenberg et al. 2009, Haughwout et al. 2008). Some sophisticated investors employ strategies such as holding properties in limited liability corporations, thus isolating their risk to individual properties and reducing the negative impact defaults might have on their future credit availability and borrowing costs (Haughwout et al. 2008). Finally, when investors lose properties to foreclosure, they are not personally subject to the burdens of eviction, moving costs, and the transactions costs associated with finding a new home to rent or buy (Gerardi et al. 2007; Haughwout et al. 2008; Belsky and Richardson 2010).

In contrast, there is evidence indicating that investors should experience *lower* risk of foreclosure. A Federal Reserve Bank of Boston study of mortgage borrowers in Southern New England finds that investors have better credit quality, face stricter underwriting by lenders, and use lower-risk loans than occupant-owners, based on measures such as average principal amounts, loan-to-value ratios, debt-to-income ratios, credit scores, and use of subprime loan products (Greenberg et al. 2009). In the case of multi-family properties where some units are rented out, investors may also be better equipped to find and manage tenants, thus ensuring a steadier stream of rent payments.

With the exception of Greenberg et al. (2009) and Haughwout et al. (2008), authors tend to treat tenure as a covariate in their analyses, rather than as a predictor that deserves detailed

investigation. Moreover, most studies use self-reported tenure indicators in loan data, which can have significant biases, or they use samples restricted to subprime borrowers, rather than capturing risk among all buyers. This is particularly important, since as Greenberg et al. (2009) point out, subprime loan use is significantly less frequent among investors than occupant-owners, particularly for the purchase of multifamily properties. Because occupant-owners and investors take out different types of loans, on average, comparing their outcomes on identical loan products may not reveal the true risk typical borrowers face. Finally, because most studies focus on the default risk faced by borrowers of specific loan products, with the loan as the unit of analysis, it is difficult to understand if investors face different overall foreclosure risk during their ownership experiences, and whether their risk is timed differently from that of occupant-owners.

Prior empirical research seems to support the argument that owners take better care of their properties than landlords (Galster, 1983). There are several theoretical arguments for why investors are more likely to make improvements. First, it may be in their financial interest, since they can avoid costly repairs through preventative maintenance (Henderson and Ioannides 1983, Gatzlaff et al. 1998, Williams 1993). Landlords may also be dissuaded from making investments, since they have a harder time than homeowners gauging the demand for improvements (Galster 1983, Rohe and Stewart 1996). Rohe and Stewart (1996) explain that homeowners see full financial return on their investments when they sell a property, whereas the financial liability for tenants is usually limited to security deposits. Harding et al. (2000) call this argument into question, however, explaining that a "resale externality" may be created by asymmetric information between buyers and sellers about the amount of upkeep a property has

received, so improvements might not be fully capitalized into house prices. Furthermore, it may be easier for homeowners to maintain their properties if they are more likely to use sweat equity, thus reducing out-of-pocket expenses for repairs and improvements (Galster 1983, Rohe and Stewart 1996). Finally, homeowners may improve their properties because of a sense of pride in their dwellings, or if they have stronger social ties in their neighborhoods, they may be more susceptible to peer pressure from neighbors to maintain their properties (Galster 1983, Rohe and Stewart, 1996).

These articles accompany a longer-standing literature on the societal impacts of homeownership versus renting. This literature is too extensive to receive an adequate description here, and Gerardi and Willen probably summarize it best when they explain that there is a "large amount of ambiguity and uncertainty in the current literature regarding the actual social benefits of homeownership. While history has certainly shown that policymakers view homeownership as a welfare-enhancing state, the economic literature does not reach the same unanimous conclusion" (2009, p. 2).

With respect to local versus non-local investment, the finance literature finds that private information held by local investors may improve the governance of the local firms in which they invest (Gaspar and Massa 2007). Better oversight of rental housing by local investors may therefore be one benefit of local ownership relative to non-local ownership. On the other hand, Gaspar and Massa (2007) also find evidence that privately held information may lower liquidity of assets owned by local investors because outsiders require a premium to offset fears of adverse selection. In terms of housing markets, we might expect asymmetric information to reduce the

liquidity of certain types of housing or of housing held by local investors, making local investor ownerships riskier. Most recently, Seasholes and Zhu (2010) found that local (individual, not corporate) investors do not appear to have superior information about local purchases, contradicting several previous studies. Other work suggests that simple familiarity, not necessarily better information, may make it more likely that investors buy close to home (Huberman 2001). If anything, relatively naïve investment by local investors could be associated with poor performance.

One thing that does seem clear from the literature is that it is important to gauge how different types of investors and occupant-owners differ in terms of turnover, foreclosure, and investment in order to evaluate their impacts on the housing market and the neighborhoods in which they own properties.

**Chelsea Data**

This paper focuses on properties in Chelsea, Massachusetts, a city of about 35,000 residents living in 1.8 square miles. As of the 2006-2008 American Community Survey, 17 percent of Chelsea's 12,798 housing units were single family homes, 21 percent of units were in 2-family structures, and 31 percent were in 3 or 4-family properties. Over 60 percent of occupied housing units were renter-occupied.

Chelsea has a large Latino population and twice the poverty rate of the rest of Massachusetts (Table 1). While Chelsea has a relatively low homeownership rate, it is considered by the Federal Reserve Bank of Boston to be one of Massachusetts' hardest-hit cities in the foreclosure crisis, on the basis of real estate owned (REO) properties per square mile, median time REOs

stay on the market, 90-day mortgage delinquency rates, and decline in median home sales prices (Federal Reserve Bank of Boston, 2009). Between January 2008 and March 2009, the median price of homes sold fell over 32%. In contrast, the median tract in Massachusetts saw a decline in home prices of 18.3%.

We obtained data for this study from multiple sources: public deed records and datasets from the City of Chelsea Assessing and Inspectional Services departments. Our primary source is a dataset of property-level transactions assembled by the Warren Group, a Massachusetts-based company that specializes in collecting residential property records from the county deed registries in New England. This dataset includes information on property transactions, including mortgage originations, foreclosure petitions, foreclosure auctions, and deed transfers, both for foreclosure and non-foreclosure sales. It also includes information on basic property traits, such as structure characteristics and recent value assessments. We utilize information on deeds, mortgages, and basic property characteristics (number of units, condo status, and year built) for all owners who purchased between 1998 and 2006.

Our dataset contains information on single family, small multi-family (2-3 unit), and condominium housing. Small multi-family buildings are considered to be owner-occupied when owners occupy a unit and rent out other units in the building. Importantly, two and three family properties represent a disproportionate share of ownerships in foreclosure in Massachusetts and so represent an important area of inquiry (Gerardi and Willen 2009). Homeownership in these buildings is sometimes pursued as either an asset building strategy or an affordable housing strategy, because owners can use expected rent to help qualify for a mortgage during the

underwriting process. Our investigation can shed light on the potential risks of such strategies. We are also able to characterize the investor ownership of condominiums, which adds an interesting dimension to our understanding of how this portion of the rental stock fared during the crisis to the extent that these units are rented by their investor-owners.

When evaluating foreclosure risk, it is important to consider the loan products used by the borrowers. Use of a subprime loan, for example, may be related to default and foreclosure risk in two ways (Gerardi and Willen, 2009). First, there is a selection effect, whereby borrowers with poor credit histories and those requiring high loan-to-value and debt-to-income ratios are more likely to use subprime loans. This group may find it more difficult to weather adverse life events and macroeconomic shocks. Second, subprime loans are typically most costly, with higher monthly payments and interest rates, which may make it more difficult for borrowers to make timely payments.

For these reasons, it is useful to differentiate between borrowers who have used subprime loans from those who have not. Although the Warren Group dataset does not include comprehensive information on loan terms, it is still possible to determine, with a reasonable degree of confidence, which loans are subprime as opposed to prime. As explained by Gerardi et al. (2007), there is no universally-accepted definition of a subprime mortgage, as traits commonly associated with subprime loans range from various borrower characteristics, loan products and terms, and securitization processes (p. 7). In order to standardize the subprime/prime distinction in their study, they make use of the U.S. Department of Housing and Urban Development (HUD) list of subprime lenders. This list, compiled in 1993 and updated annually until 2006, identifies

mortgage lenders whose originations include a high percentage of "high-cost" loans, with higher interest rates charged to compensate for borrowers' elevated credit risk (Gerardi et al., 2007, p. 6).[2] Using the same practice employed by Gerardi et al., we categorized loans as subprime if the lender was included on the HUD list.[3]

In order to differentiate between occupant-owners and investors, we supplement the transactions dataset with four sources of data: owners' mailing addresses, residential property tax exemptions, Declarations of Homestead, and occupancy indicators from the 1998-2006 HMDA datasets.[4] We use the mailing address of the owner (according to local tax records) as the principal indicator of tenure. Owners who receive their tax bills at the property in question are considered to be occupant-owners, while those who receive bills at other physical addresses are considered investors. Of the 3,384 owners who purchased one to three-family or condo properties between January 1998 and December 2006, we can identify the tenure of nearly 84% with the address data.[5] For the remaining owners, whose address data are missing or ambiguous, we rely on the three other datasets.[6] We are able to identify the tenure of all but 83 owners, or over 97.5% of the population. By comparing the different sources of data, we find that the address data are consistent with Declarations of Homestead and residential tax exemptions.

In contrast, the HMDA indicator fails to classify 15% of our sample, and for those it does classify, we notice a strong bias. The HMDA indicator misclassifies over 41% of our investors as occupant-owners, while mistaking less than 3% of our occupant-owners as investors. The bias in the HMDA indicator may result from incomplete information and misrepresentation of occupancy status on the part of mortgage applicants and/or brokers in order to make an investor-

applicant appear more credit worthy and to secure more favorable loan terms (Pendley, Costello, and Kelsch 2007; Lefcoe 2009; Haughwout et al. 2008). A detailed review by Fitch of 45 subprime loans found that 66% of borrowers had misrepresented themselves as occupant-owners, the most common type of fraud discovered (Pendley, Costello, and Kelsch 2007).

Finally, we obtained records on every building permit filed with the City of Chelsea's Inspectional Services Department between January 1998 and July 2010. For each permit we know the property address, date, permit fee paid, and a description and cost estimate of the work to be completed. After cleaning and standardizing the addresses, we matched the building permit records to the Warren Group data for all one to three-family properties. We excluded permit data on condominiums because it is often impossible to determine which condo units at a given address received the improvements. We believe that the building permit data in Chelsea is a good approximation of improvements made in properties, since the City regularly patrols neighborhoods, issuing "stop work" orders to those without permits.

**Tenure and Foreclosure Rates**

We follow the 3,301 owners in our sample from the time of purchase starting in 1998 through disposition or the second quarter of 2010, whichever comes first. According to our measure, nearly 14% (453) of these owners are investors (Table 2). Notice that the corresponding occupant-ownership rate of 86% is higher than the homeownership rate reported by the ACS (39%, Table 1). This is because we count ownerships at the building level for non-condominium owners, such that we undercount rental tenure relative to the ACS when owners-occupants live in one unit in a multi-family building and rent out the others.

A quick look at differences between occupant-owners and investors in the top panel of Table 2 shows that the rate of foreclosure is somewhat lower among investors than occupant-owners (6.0% vs. 7.8%, respectively). However, the rate of non-foreclosure sales is greater for investors (41% as opposed to 33%). In addition, investors are less like to make their initial purchase with a subprime loan and have significantly lower combined loan-to-value ratios. In fact, a number of investors (nearly 10% in our sample) never take out a mortgage. Figure 1 shows the distribution of the sample ownerships by year of purchase. Purchases by occupant-owners tend to rise with the underlying house price index for the area, though the relationship between prices and investor purchases is less clear.

We highlight the differences in characteristics between the two types of investors, local and non-local, in the lower panel of Table 2. A main difference is that local investors (those living in Chelsea or one of the abutting towns) are more likely to purchase two and three-family homes than are either occupant-owners or non-local investors; 64% of local investors purchased these small multifamily properties, as opposed to about 40% for either of the other two groups. The purchase of 3-family homes by local investors is particular noteworthy. Thus, homeowners and non-local investors predominantly buy condominiums, while local investors appear to specialize in properties with greater information asymmetry and potential for generating rental income. Local and non-local investors do not appear to differ in terms of loan characteristics. However, local investors have significantly higher rates of both foreclosure and non-foreclosure sales.

Because the different types of properties in our sample attract different types of owners, we explore owner characteristics by property type in Table 3. Three-family properties have the lowest occupant-ownership rate at 77%, and CLTVs are higher for the non-condominium multi-family properties. Interestingly, we estimate that 12% of condominium owners are investors. In addition, condominium ownerships are significantly less likely to use a subprime mortgage or to end in foreclosure.

**Tenure and Turnover**

In this section, we summarize length of ownership in our sample. Simply documenting any differences by tenure is of interest, because we do not find any baseline in the extant literature. In addition, very short periods of ownership may be associated with problematic flipping or speculation. Following Depken et al. (2009), in this section we define a "flip" as a holding period of less than 2 years.[7]

We begin by examining the typical duration of ownerships, which we display in Figure 2 using Kaplan-Meier survival estimates by tenure. The relative steepness of the estimated survivor functions readily demonstrates the lower survivor rate of investor ownerships. Since less than half of the occupant-owners sell by the end of our observation period, we cannot estimate a median length of ownership for comparison. However, looking at the point in time by which the 25th percentile of each tenure group has sold, we estimate a quartile length of ownership for investors of 3 years and 5 months after purchase, whereas the quartile length of occupant-ownership does not occur until about 11 months later. Therefore in our sample, investors appear to have shorter ownership periods than occupant-owners.

We also estimate the duration of ownership for local and non-local investors. Whereas the quartile ownership length for occupant owners was about 4 years, 4 months, local investors had a quartile ownership length of just 2 years, 9 months. Non-local investor ownership lengths look much like owner-occupants, with the quartile ownership of non-local investors' just two months shorter. Furthermore, while 21% of local investors sell within 24 months, only 13% of non-local investors flip, suggesting that local investors generate more turnover within the community. When we test for statistical significance, we find that local investors are more likely to flip as compared to occupant-owners and to non-local investors.[8]

Many of the ownerships in our sample are so short that they could reasonably be called flips. In Table 4 we show the distribution of ownership durations for those ownerships that have not ended in foreclosure. Just over 37% of these owners had sold, 11% selling after holding their properties for less than 2 years, our definition of a flip. Thus, nearly a third of non-foreclosure sales were flips. By way of comparison, Depken et al. (2009) estimate that 30% of transactions in their sample of houses that sold at least twice were "flipped" in Las Vegas over a similar time period. Interestingly, we do not observe any difference in the rate of turnover between single-family and small multifamily properties bought between 1998 and 2006. However, condos were less likely to be flipped than other property types (9% are flipped, as opposed to 11% of other properties, $p < .001$).

Not surprisingly, flipping activity is correlated with the strength of the area housing market. Figure 3 describes the percentage of all purchases classified as flips relative to all ownerships in

this sample by year of purchase. Flippers seem to have taken advantage of the strong housing market leading up to the recession in 2001, and although flipping declined through 2002, it became more common as the market quickly rebounded in 2003. The ability to sell within 24 months of purchase seems to have subsided for properties purchased between 2004 and 2006. We suspect any owners who purchased during this time with intentions to flip were stymied by the leveling off and subsequent fall in house prices starting in 2006. Interestingly, investors' participation in flips fell as prices rose during the period 2003-2005, though overall they are disproportionately likely to flip. In our sample they make up less than 14% of ownerships, but more than 21% of flips.

**Foreclosure and Non-foreclosure Sales**

In this section we jointly model the likelihood of an ownership ending in a foreclosure or non-foreclosure sale during our study period. Because the ability of defaulting owners to sell clearly impacts the observed rate of foreclosures (and foreclosures extinguish the ability of owners to sell), we use a competing risks model to capture this potential interaction. This approach also allows us to control for various explanations of turnover and foreclosure, some of which may be correlated with tenure.

*Methodology*

We use multinomial logistic regression to fit discrete-time competing-risks hazard models, in which we estimate the likelihood of an ownership ending in foreclosure or a non-foreclosure sale at different points in time ($t$). We have structured our panel data so that we begin observing each owner ($i$) at the time of purchase ($t = 1$), and we identify at the end of each subsequent calendar

quarter ($t$) which of three outcomes ($j$) the owner experiences: the owner can continue to hold the property ($j = 0$), lose the property through a foreclosure sale ($j = 1$), or sell the property through a non-foreclosure sale ($j = 2$), conditional on having held the property since purchase in all prior periods.[9] All owners who had not sold their properties at the end of 2010 Q2 are treated as right-censored. In order to take into account the underlying differences in house prices, underwriting standards, and other macroeconomic factors at the time different owners purchase their properties, we include a quadratic polynomial control for the buyer's cohort, which measures the year in which the owner bought the property.

Exploratory data analysis on the relationship between time since purchase, buyer cohort, and sale outcome led us to choose a parametric specification of time for our model, with our baseline hazard including a cubic polynomial of time and quadratic cohort effects.[10]

Tracking the owners in discrete time since purchase and controlling for their cohort also allows us to accommodate relevant time-varying predictors that reflect macroeconomic forces, such as changes in unemployment, house prices, and the 6-month LIBOR, to which many mortgage interest rates are pegged. We expect high rates of house price appreciation to be positively correlated with the rate of sales and negatively related to foreclosures. Thus, we incorporate the percent change in local house prices over the past year. With respect to foreclosures, the "double-trigger" model suggests that foreclosures are induced by both falling house prices and negative income shocks.[11] Therefore, in addition to house price appreciation, we also control for the (one-year) lagged rate of unemployment and the percentage point change in unemployment over the last year. Low interest rates are also expected to facilitate sales relative to periods of

high interest rates and to make it more difficult for owners to refinance, which could increase the likelihood of default, and subsequently, foreclosure. We use the 6 month LIBOR, lagged one year, to capture relevant interest rate levels leading up to the time of foreclosure or non-foreclosure sale. Table 5 displays summary statistics for these indicators.

In addition to macroeconomic variables, we also control for the combined loan-to-value ratio (coded as 0 to 1.1 to signify 0% to 110% CLTVs) and a dummy variable for the use of subprime loans at purchase as indicators of default risk.[12] The expected impact of these variables on non-foreclosure sales is ambiguous. We recognize the potential endogeneity of these factors – owners may select financing based on their expectations and lenders' perceptions about their likelihood of sale or foreclosure. However, we are not seeking a causal explanation of the impact of financing on the sale hazards, but want to calculate a conditional likelihood of foreclosure given certain financing characteristics at purchase.[13] In addition, we are concerned that condominium ownership differs from ownership of whole buildings, and as noted previously, condominium foreclosure rates are lower than for other ownerships we observe. We also test whether single-family, two-, and three-family properties exhibit different risks of sale or foreclosure, but these factors are never significant in any of our specifications. We test for all two-way interactions between covariates and include those that significantly improve the fit of our model.

Therefore, the probability of an ownership $i$ ending in foreclosure ($j = 1$) or non-foreclosure sale ($j = 2$) at time $t$ can be expressed as:

$$\pi_{jit} = \frac{\exp(\beta_{j0} + \beta_{j1} z_{it} + \beta_{j2} x_i + \beta_{j3} w_{it})}{1 + \sum_{k=1}^{2} \exp(\beta_{k0} + \beta_{k1} z_{it} + \beta_{k2} x_i + \beta_{k3} w_{it})}$$

with fixed covariates $x_{ji}$, time-varying covariates $w_{jit}$, and a function of duration $z_{jit}$.

*Results*

Table 6 reports the results of our competing risks model. In all specifications, we control for yearly cohorts of purchase and for time elapsed since purchase, measured in calendar quarters. Our baseline specification, Model 1, includes only time since purchase, cohort, and macroeconomic effects, with a dummy variable to capture the difference in foreclosure and sale hazards between occupant-owners and investors. Examining Model 1 with respect to foreclosure sales, we find that investors are no more or less likely to enter into foreclosure as compared to occupant-owners, though they are significantly more likely to sell in a non-foreclosure transaction (about 1.5 times as likely as occupant-owners).

The macroeconomic conditions controlled for in our model are correlated with foreclosure and non-foreclosure sales in different ways. Rising house prices lower the likelihood of foreclosure sales and have a small positive impact on probability of non-foreclosure sales. There is a small negative relationship between interest rates and non-foreclosure sales.

The interpretation of our unemployment controls is less clear. The sale hazard falls with higher levels of unemployment and with recent increases in the unemployment rate. Our

unemployment controls are less successful at predicting foreclosures, largely because cohort controls account for some changes in the strength of the local economy over the period.[14]

Because condominium ownerships tend to behave differently than ownerships of whole structures, we create a second specification (Model 2) to control for condo status. Condo ownerships in our sample are much less likely to go into foreclosure (about one-third as likely as one to three-family properties). The main effect of condo ownership is small and not significant for foreclosure sales, but the interaction between condo and investor status suggests that investors who own condos are less likely to sell than their counterparts who own 1-3 family properties, all else equal.

Our findings in Model 3 suggest no differences between local investors, those who live in Chelsea or one of the abutting towns, non-local investors and occupant-owners with respect to likelihood of foreclosure. All investors continue to have a greater likelihood of non-foreclosure sales as compared to occupant owners.

To control for the impacts of financing on either hazard, we include a dummy variable for subprime purchase mortgage and the combined CLTV at purchase in Model 4. In doing so, we merely intend to control, as part of our baseline, for the higher level of risk associated with these owner/loan characteristics and do not propose a causal interpretation of these coefficients. Owners have CLTVs equal to zero if they did not use a mortgage at purchase.

The use of subprime mortgages is positively related to both types of sale. Higher CLTVs at purchase are also positively associated with the likelihood of foreclosure but are not significantly related to non-foreclosure sales. The effects of subprime loans and greater CLTVs at purchase dissipate with the length of ownership, as evidenced by the negative coefficients on the interactions between the loan terms and time since purchase. For example, while the use of a subprime mortgage indicates a greater initial likelihood of foreclosure as compared to using a prime mortgage or no mortgage at all (7 times as likely to experience foreclosure), this impact falls as time passes since purchase. Perhaps most interestingly, after controlling for CLTVs and subprime loan use at purchase, Model 4 estimates that the difference in foreclosure risk between local investors and occupant-owners is now statistically significant due to a larger coefficient for a non-local investor. In contrast, the coefficient for non-local investors is not significantly different from zero, signifying that these absentee investors face no less or greater risk of foreclosure than occupant-owners, after controlling for basic financing characteristics, time since purchase, type of property purchased, and cohort. Unfortunately, the non-local investor coefficient is not estimated with enough precision to distinguish it from the coefficient for local investors. We suspect that our small subsamples limit our power to differentiate these coefficients.

In order to illustrate the differences between the three types of investors' foreclosure and sale hazards, we present the probabilities of both types of sale for three cohorts of buyers: those who purchased in the second quarters of 2000, 2003, and 2006. Figure 4 displays the foreclosure hazard, which peaks for each cohort around the second quarter of 2008. Foreclosure risk is higher for those in later cohorts, perhaps due to the greater house prices and looser underwriting

standards these cohorts faced at purchase, as well as their limited time to build equity in their properties before prices collapsed and unemployment rose, beginning in late 2007 and early 2008. Local investors have a consistently higher risk of foreclosure than occupant-owners, a product of there being no significant interaction between cohorts or time and investor status.

The non-foreclosure sale hazards, shown in Figure 5, are more similar across cohorts, after allowing for an initial year or two to pass after purchase. The likelihood of sale has decreased for cohorts since 2006, though we see an up-tick in sales since late 2009. One explanation for this recent increase could be the growing number of short-sales in Chelsea.

To aid in the interpretation of the Model 4 coefficients across tenure, structure, and loan characteristics, we also display foreclosure hazard probabilities for the three chosen cohorts in Table 7. Here we choose a cross-section in time, the second quarter of 2008, which was the height of foreclosure risk for most cohorts. For Chelsea, our model predicts that local investors who purchased 1-3 family properties in the second quarter of 2006 without a subprime loan experienced a 2.0% rate of foreclosure, whereas occupant-owners without subprime loans at purchase in 2006 had a 1.1% predicted rate of foreclosure in the second quarter of 2008. In contrast, local investors and occupant-owners who used a subprime mortgage at purchase in 2006 had an 8.5% and 5.0% chance respectively of entering foreclosure in 2008Q2. Thus the timing of purchases relative to the onset of the housing crisis and the type of loan utilized by owners are very dominating features of this model, as expected. Nonetheless, the magnitude of foreclosure risk associated with local investors appears economically significant.

The results of the competing-risks model suggest that after controlling for the types of properties purchased and the financing used, as well as macroeconomic factors, local investors face greater foreclosure risk than other groups. While both groups of investors are more likely to sell outside foreclosure than occupant-owners, our analysis of ownership duration indicates that local investors typically hold their properties for a shorter period of time and are more likely to "flip" homes. All this holds true, despite the fact that subprime loan use and CLTVs appear comparable across the two groups of investors. We next turn to an examination of building permit data to understand the relative levels of investment made by the different owner groups.

**Investment in 1-3 Family Homes**

We calculate the rate of investment and the total value of work for building permits matched to 1-3 family homes in our sample. Table 8 shows that there is some variation between owner groups in the share filing for at least one building permit, however we find that none of the differences between sub-samples are statistically significant. Nor can we distinguish and differences between the mean values of the proposed work. However, we also examine the value of the proposed investment relative to the purchase price, measured in 2010 dollars. We find that among owners overall (and particularly for owners of three-family properties), local investors invest more relative to the purchase price of the buildings than do non-local investors and occupant-owners. Estimates of investment value obtained from building permits show that local investors plan to invest 10% of purchase price in properties where as non-local investors invest only 8% and occupant-owners just 4%. For three-family properties the difference is particularly pronounced, with local investors intending to invest 14% of the purchase price, as opposed to 3% for occupant-owners and 5% for non-local investors (the means are significantly different at

better than the 5% level). Three-family properties are particularly interesting, since all three owner groups hold a large number (at least 70 each).

Finally, Table 9 links flipping behavior with investment. In an unconditional sense, flippers are less likely than non-flippers to pull at least one building permit. However, if we restrict the timeframe over which we observe building permits regardless of whether an owner flips or not, we find that nearly a third of both groups pull at least one building permit within the first two years of their ownerships. This suggests that "flippers" in this sample do not invest at a rate different from other owners early in their tenure, or in other words, despite the fact that flippers are less likely to invest than non-flippers, flipping does not inherently lead a property to receive less investment over time, and in some imaginable scenarios, could lead to *greater* investment over time.

The findings that local investors are more likely to flip and to heavily invest relative to purchase prices leads us to believe that locals (with better knowledge and easier ability to oversee investment, due to proximity) were more likely to take advantage of "rehab flipping" opportunities than other owner groups. In other words, local investors pursued riskier investment strategies that ultimately resulted in higher rates of foreclosure. Comparing annualized returns among sub-groups of owners reveals that local investors made greater returns than occupant-owners prior to 2006.[15] The difference in rates of return is consistent with our speculation that local investors undertook riskier investment strategies as compared to occupant-owners or other, non-local investors during this period.

**Conclusions and Opportunities for Future Research**

In this paper we use a uniquely rich dataset to examine the propensity of investors to sell, lose their properties to foreclosure, and make capital improvements over time relative to occupant-owners in Chelsea, Massachusetts. We find that investors are more likely to sell their properties, resulting in higher ownership turnover. Local investors (those living in Chelsea and abutting towns) are particularly likely to hold properties for shorter periods of time and to "flip" properties.

Although as a group investors are statistically no more likely to experience foreclosure, after controlling for the types of properties owned and the financing used at purchase, we find that local investors are more likely than other groups to experience foreclosure. For example, local investors owning single-family and small multifamily properties experienced approximately 1.8 times the foreclosure risk of occupant-owners. Non-local investors owning these properties have no statistically significant difference in foreclosure risk from occupant-owners, and among condo owners, absentee investors may experience *even lower* risk of foreclosure.

This evidence on local investors' likelihood of flipping and foreclosure is not to say they are somehow less responsible owners who prey on the community. In fact, we find these investors are more likely than any other group to make investments in their properties. We find a particularly strong pattern of local investors purchasing small multifamily properties and investing large amounts of money relative to the purchase price. Combined with the knowledge that both groups of investors share common types of financing at purchase (with lower combined loan-to-value ratios and less use of subprime products than occupant-owners), we believe that

local investors are not inherently risky owners, but rather that they take on projects that involve greater risk. Further research could shed light on the behavior of local and non-local investors in terms of their relative foreclosure risk, likelihood of flipping, and propensity to make improvements in properties. One potential avenue would be to compare their financial capacity and the degree to which their real estate assets are diversified across communities, thus leaving them less exposed to price shocks in particular areas.

In terms of overall impact on neighborhoods, subprime mortgage holders are more likely to enter foreclosure than local investors, all else equal. In our sample, 90% of the 500 owners who initially bought using a subprime mortgage were owner-occupiers. On net, we think this evidence argues for more nuanced policies with respect to tenure in urban neighborhoods with varied structure and tenure types as cities seek to stabilize neighborhoods. It is clear that owners who select into and then have to follow the terms of riskier mortgage products are less able to withstand a shock to local housing markets. Thus homeownership may not be a panacea for neighborhood stability. The results of our study suggest that investors may both help and hurt neighborhoods. While Chelsea's dense, multi-family housing stock and prevalence of investor-owners may not make it representative of U.S. (or even New England) communities, we feel our results in Chelsea are likely to generalize to other communities to the extent that local investors pursue opportunities involving greater risk. In the very least, the distinction among local and non-local investors is a topic worthy of further investigation, as is the impact of foreclosures, flipping, and property investment on neighborhoods.

*The authors appreciate the comments of participants in sessions and seminars at the APPAM meetings, October 2009, Washington, DC; the Urban Affairs Association annual conference,*

*March 2010, Honolulu, HI; the Federal Reserve Bank of Boston; and Penn State University. We also thank Paul Willen for his assistance, John Willett and Rachel Slama for their advice on an earlier draft of this work, Ken Stein and Joe Cooney, City of Chelsea Directors of Assessing and Inspectional Services, respectively, the editor and two anonymous reviewers.*

## References


Barnstable Registry of Deeds (no date listed). Homestead Questions. Retrieved July 31, 2009, from: http://www.bcrd.co.barnstable.ma.us/homestd.html

Been, V. and A. Glashausser 2009. Tenants: Innocent Victims of the Nation's Foreclosure Crisis. *Albany Government Law Review* 2: 1-28. Retrieved from: http://www.albanygovernmentlawreview.org/articles/2/1/Glashausser.pdf.

Belsky, E.S. and N. Richardson. 2010. Understanding Boom and Bust in the Nonprime Mortgage Market. Joint Center for Housing Studies of Harvard University. Retrieved 13 November 2010 from: http://www.jchs.harvard.edu/publications/finance/UBB10-1.pdf

Campbell, J.Y., S. Giglio, and P. Pathak. 2009. Forced Sales and House Prices. NBER Working Paper Series, v. w14866, April 2009. Retrieved from: http://ssrn.com/abstract=1376188

Coulson, N.E., S. Hwang, and S. Imai. 2003. The value of Owner Occupation in Neighborhoods. *Journal of Housing Research* 13(2): 153-174.

Depken, C.A., H. Hollans, and S. Swidler. 2009. An Empirical Analysis of Residential Property Flipping. *Journal of Real Estate Finance and Economics* 39 (3): 248-263.

Dietz, R.D. 2003. The social consequences of homeownership. Working paper, draft date 18 June 2003. Available at: http://www.newtowncdc.org/pdf/social_consequences_study.pdf.

Federal Financial Institutions Examination Council. 2006. " A Guide to HMDA Reporting: Getting It Right!" 2006 edition. Retrieved 11 August 2009, from: http://www.ffiec.gov/hmda/pdf/2006guide.pdf

Federal Reserve Bank of Boston. 2009. Real Estate Owned (REO) Stabilization Opportunity Score. Retrieved 11 August 2009, from: http://www.bos.frb.org/commdev/foreclosures/reo/mar-2009/SOS-MA.pdf

Foote, C.L., K. Gerardi, L. Goette, and P.S. Willen. 2008. Just the Facts: An Initial Analysis of Subprime's Role in the Housing Crisis. *Journal of Housing Economics* 17: 291-305.

Foote, C.L., K. Gerardi, L. Goette, and P.S. Willen. 2009. Reducing Foreclosures: No Easy Answers. National Bureau of Economic Research, Working Paper No. w15063. Draft June 2009. Retrieved 21 October 2010, from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1418921.

Galster, G. (1983). Empirical Evidence on Cross-Tenure Differences in Home Maintenance and Conditions. *Land Economics* 59(1): 107-113.

Gaspar, J.M. and M. Massa. 2007. Local Ownership as Private Information: Evidence on the Monitoring-Liquidity Trade-Off. *Journal of Financial Economics* 83: 751–792.

Gatzlaff , D.H., R.K. Green, and D.C. Ling. 1998. Cross-Tenure Differences in Home Maintenance and Appreciation. *Land Economics* 74 (3): 328-342.

Gerardi, K., A.H. Shapiro and P.S. Willen. 2007. Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures. Working Paper. Retrieved 24 February 2010, from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1073182

Gerardi, K. & P.S. Willen. 2009. Subprime Mortgages, Foreclosures, and Urban Neighborhoods. *The B.E. Journal of Economic Analysis & Policy*, 9 (3), article 12.

Greenberg, J., R. Essene and K. Lee. 2009. The Myth of the Irresponsible Investor: Analysis of Southern New England's Small Multifamily Properties. New England Community Developments: Emerging Issues in Community Development and Consumer Affairs. Federal Reserve Bank of Boston, 1, 8-11. Retrieved 10 February 2010 from: http://www.bos.frb.org/commdev/necd/2009/issue1/myth.pdf

Harding, J., T.J. Miceli, and C.F. Sirmans. 2000. Do Owners Take Better Care of Housing than Renters? *Real Estate Economics*, 28 (4): 663-681.

Harding, J.P., E. Rosenblatt, and V.W. Yao. 2009. The Contagion Effect of Foreclosed Properties. *Journal of Urban Economics*, 66 (3): 164-178.

Haughwout, A., R. Peach and J. Tracy. 2008. Juvenile Delinquent Mortgages: Bad Credit or Bad Economy? *Journal of Urban Economics* 64: 246-257.

Henderson, J.V. and Y.M. Ioannides. 1983. A Model of Housing Tenure Choice. *American Economic Review* 73 (1): 98-113.

Huberman, G. 2001. Familiarity Breeds Investment. *The Review of Financial Studies* 14 (3): 659-680.

Immergluck, D. & G. Smith. 2005. There Goes the Neighborhood: The Effect of Single-Family Mortgage Foreclosures on Property Values. Woodstock Institute. Retrieved 10 February 2010 from: www.nw.org/foreclosuresolutions/reports/documents/TGTN_Report.pdf

Lefcoe, G. 2009. Should We Ban or Welcome 'Spec' Home Buyers? University of Southern California Legal Studies Research Paper No. 09-33. Retrieved 10 October 2010 from: http://ssrn.com/abstract=1446778.

Lin, Z., E. Rosenblatt, and V.W. Yao. 2009. Spillover Effects of Foreclosures on Neighborhood Property Values. *Journal of Real Estate Finance and Economics* 38 (4): 387-407.

Malpezzi, S. and S.M. Wachter. 2005. The Role of Speculation in Real Estate Cycles. *Journal of Real Estate Literature* 13(2): 141-164.

Massachusetts Department of Revenue. 2009. Property Tax Information: Residential Exemption. Retrieved 31 July 2009, from: http://www.mass.gov/Ador/docs/dls/mdmstuf/LocalOptions/ResidentialExemption.xls

Pendley, M. D, G. Costello, and M. Kelsch. 2007. The Impact of Poor Underwriting Practices and Fraud in Subprime RMBS Performance. FitchRatings U.S. Residential Mortgage Special Report. Retrieved 18 October 2010 from: http://www.mortgagebankers.org/files/News/InternalResource/58467_TheImpactofPoorUnderwritingPracticesandFraudinSubprimeRMBSPerformance.pdf

Rohe, W.M. and L.S. Stewart. 1996. Homeownership and Neighborhood Stability. *Housing Policy Debate* 7(1): 37-81.

Rohe, W.M., S. Van Zandt, and G. McCarthy. 2002. Social Benefits and Costs of Homeownership. In *Low-Income Homeownership: Examining the Unexamined Goal*, edited by Nicholas P. Retsinas and Eric S. Belsky, 381-406. The Brookings Institution: Washington, D.C.

Rogers, W.H. and W. Winter. 2009. The Impact of Foreclosures on Neighboring Housing Sales. *Journal of Real Estate Research* 31 (4): 455-479.

Seasholes, M.S. and N. Zhu. 2010. Individual Investors and Local Bias. *The Journal of Finance* 65 (5): 1987 – 2010.

Schuetz, J., V. Been, and I.G. Ellen. 2008. Neighborhood Effects of Concentrated Mortgage Foreclosures. *Journal of Housing Economics* 17: 206-319.

Singer, J.D. and J.B. Willett. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence.* New York: Oxford University Press.

Wallin, B. 2004. The Tax Revolt in Massachusetts: Revolution and Reason. *Public Budgeting and Finance* 24 (4): 34-50.

Wardrip, K.E. and D. Pelletiere. 2008. Properties, Units, and Tenure in the Foreclosure Crisis: An Initial Analysis of Properties at the End of the Foreclosure Process in New England. National Low Income Housing Coalition, Research Note #08-01. Retrieved 31 July 2009 from: http://www.nlihc.org/doc/RN-08-01-Multi-Unit-Foreclosure-FINAL-05-06-08.pdf

Williams, J.T. 1993. Agency and Ownership of Housing. *Journal of Real Estate Finance and Economics* 7: 83-97.

## Tables and Figures

**Table 1:** 2006-2008 Demographics for Chelsea and Massachusetts

| | **Chelsea** | **Massachusetts** |
|---|---|---|
| Population | 34,356 | 6,469,770 |
| Percent Black | 9.0 | 6.1 |
| Percent Asian | 2.0 | 4.8 |
| Percent Latino | 56.1 | 8.3 |
| Poverty Rate | 20.0 | 10.0 |
| Unemployment Rate | 6.5 | 4.0 |
| Homeownership Rate | 38.8 | 64.9 |
| Median Home Value | 343,100 | 363,900 |

Note: This table compares recent population and housing characteristics in Chelsea to Massachusetts. Data for this table are from 2006-2008 American Community Survey, U.S. Census Bureau. Percent Black and percent Asian include single-race, non-Hispanic/Latino.

**Table 2:** Characteristics of Owners by Tenure Type

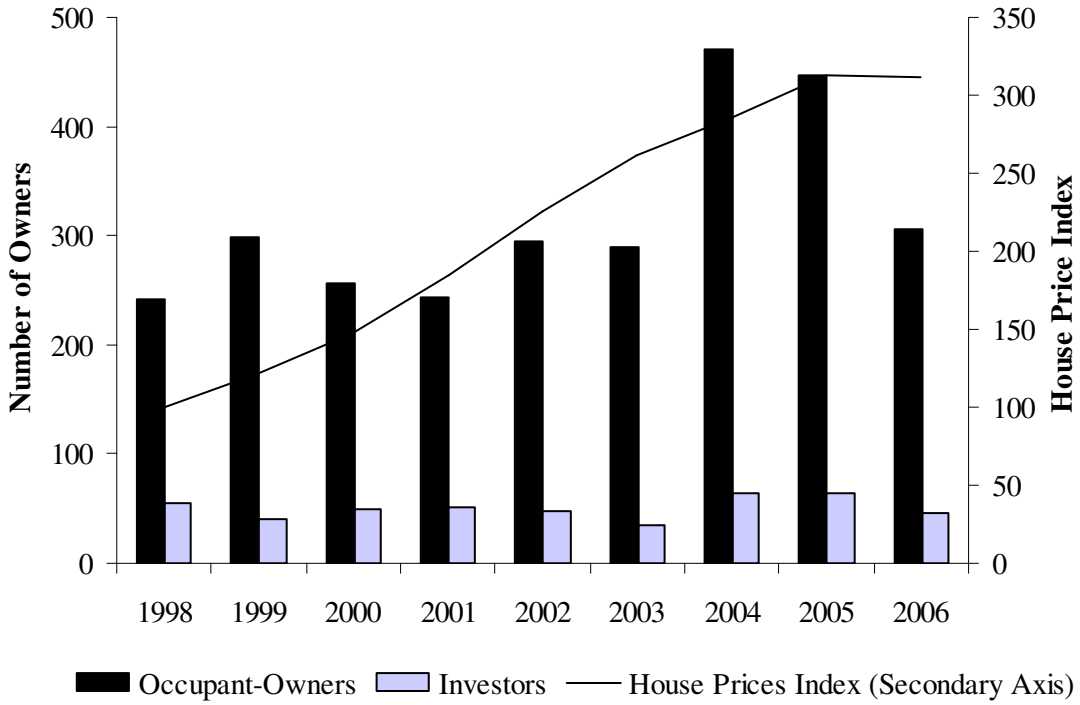
| | **Occupant-Owners** | **Investors** | **All Owners** |
|---|---|---|---|
| Number of Owners | 2,848 | 453 | 3,301 |
| Single Family (% of total) *** | 14.7 | 7.7 | 13.8 |
| 2-Family * | 21.6 | 18.1 | 21.1 |
| 3-Family *** | 16.9 | 32.2 | 19.0 |
| Condominium * | 46.7 | 41.9 | 46.0 |
| % with Subprime Mortgage at Purchase *** | 15.9 | 10.2 | 15.1 |
| Mean Combined Loan-to-Value Ratio at Purchase† *** | 86.3 | 75.8 | 84.8 |
| % with no Mortgages *** | 2.4 | 9.5 | 3.4 |
| % Sold through Foreclosure ~ | 7.8 | 6.0 | 7.5 |
| % Sold not through Foreclosure *** | 33.2 | 41.3 | 34.3 |
| | **Local Investors** | **Non-Local Investors** | |
| Number of Owners | 193 | 260 | |
| Single Family (% of total) | 7.8 | 7.7 | |
| 2-Family *** | 24.9 | 13.1 | |
| 3-Family ** | 39.4 | 26.9 | |
| Condominium *** | 28.0 | 52.3 | |
| % with Subprime Mortgage at Purchase | 10.9 | 9.6 | |
| Mean Combined Loan-to-Value Ratio at Purchase† | 74.7 | 76.6 | |
| % with no Mortgages | 10.9 | 8.5 | |
| % Sold through Foreclosure ** | 9.3 | 3.5 | |
| % Sold not through Foreclosure * | 46.6 | 37.3 | |

†Winsorized at 97th percentile

Difference between owners significant: ~ at .1 level, * at .05 level, ** at .01 level, *** at .001 level (one-tailed)

Notes: This table presents information on the properties purchased, financing used, and sale and foreclosure outcomes for occupant-owners and local and non-local investors who purchased 1-3 family houses or condominium units between 1998 and 2006. The primary data for this table come from a dataset of property-level transactions assembled by the Warren Group. Subprime mortgage indicators are derived from matching mortgage lenders in the Warren Group data to the U.S. Department of Housing and Urban Development (HUD) list of subprime lenders. We use data from the City of Chelsea Assessing department to distinguish between owners who receive their tax bills at the property in question (occupant-owners) and those who receive bills at other physical addresses (investors). Local investors are those who receive tax bills in Chelsea or one of the abutting towns.

**Figure 1:** Number of Owners in Sample by Year of Purchase




Notes: This figure displays the number of investors and occupant-owners in our sample by purchase year, accompanied by the local house price index. The data for this figure come from a dataset of property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses or condominium units between 1998 and 2006. The house price index is calculated by the authors using a weighted repeat-sales methodology and is based on sales of 1-3 family and condo properties in Chelsea. We use data from the City of Chelsea Assessing department to distinguish between owners who receive their tax bills at the property in question (occupant-owners) and those who receive bills at other physical addresses (investors).

**Table 3:** Characteristics of Owners by Property Type

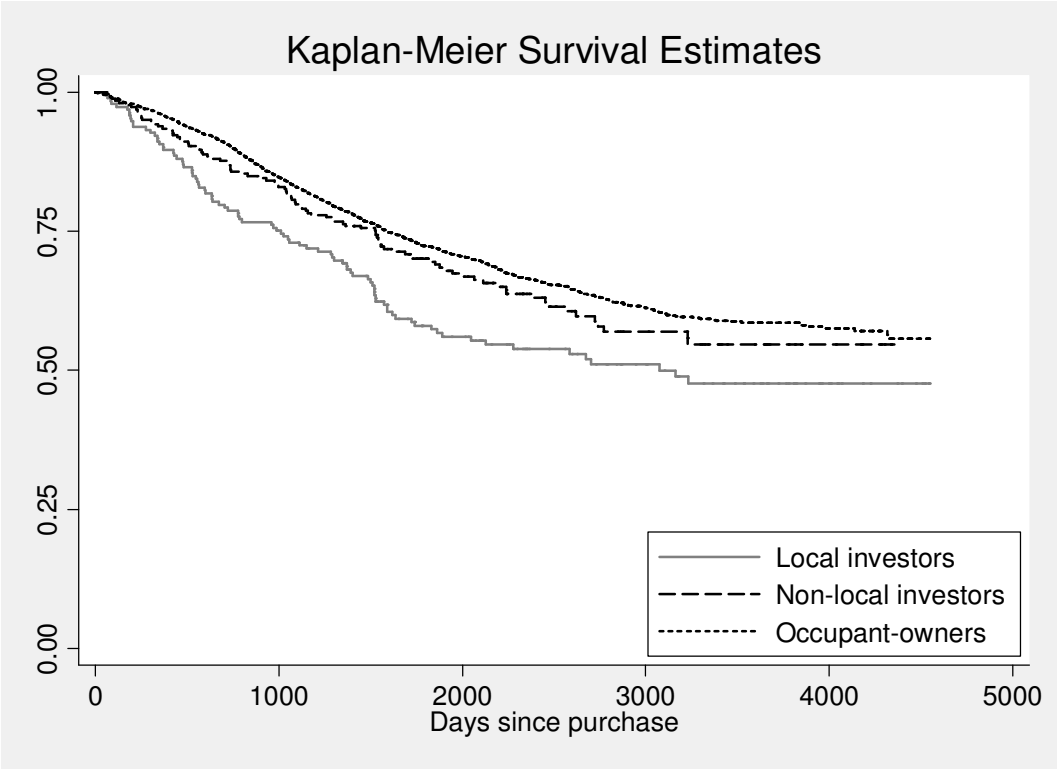
| | **Single-Family** | **2-Family** | **3-Family** | **Condominium** | **All Properties** |
|---|---|---|---|---|---|
| Owners | 455 | 698 | 628 | 1,520 | 3,301 |
| % Owner-Occupied* | 92.3 | 88.3 | 76.8 | 87.5 | 86.3 |
| % with Subprime Mortgage at Purchase*** | 18.2 | 24.8 | 15.0 | 9.9 | 15.1 |
| Mean Combined Loan-to-Value Ratio at Purchase† *** | 82.0 | 90.5 | 90.6 | 80.7 | 84.8 |
| % Sold through Foreclosure*** | 8.8 | 11.2 | 9.9 | 4.5 | 7.5 |
| % Sold not through Foreclosure** | 34.1 | 33.8 | 40.8 | 32.0 | 34.3 |

†Winsorized at 97th percentile

Difference between condos and 1-3 family properties significant: ~ at .1 level, * at .05 level, ** at .01 level, *** at .001 level (one-tailed)

Notes: This table displays the differences the type of ownership, financing used, and sale outcomes by the type of property (1-3 family or condo). The primary data for this table come from a dataset of property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses or condominium units between 1998 and 2006. Subprime mortgage indicators are derived from matching mortgage lenders in the Warren Group data to the U.S. Department of Housing and Urban Development (HUD) list of subprime lenders.

**Figure 2:** Time to Resale in Days




Notes: This figure plots the estimated duration between purchase and resale for occupant-owners, local investors, and non-local investors in our sample. Owners who lost their properties through foreclosure are not included in these estimates. The underlying data for this figure come from a dataset of property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses or condominium units between 1998 and 2006. We use data from the City of Chelsea Assessing department to distinguish between owners who receive their tax bills at the property in question (occupant-owners) and those who receive bills at other physical addresses (investors).

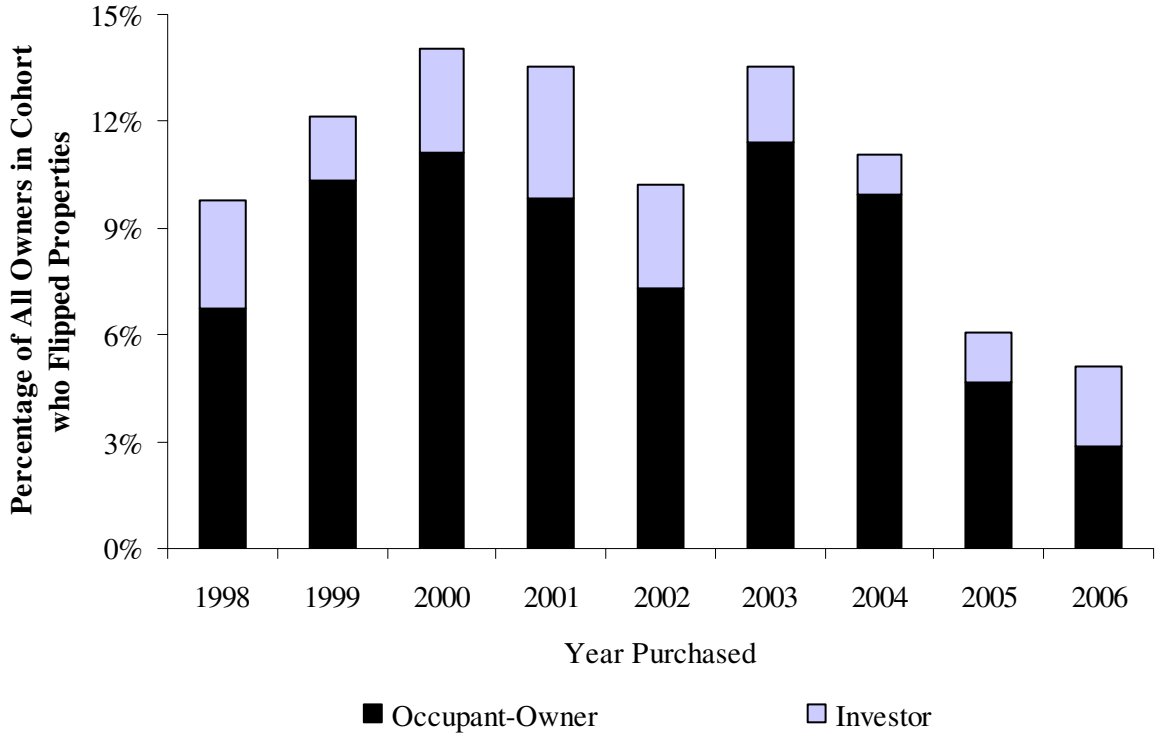
**Table 4:** Non-Foreclosure Sales by Months Owned

| Months Held | Owners Selling | Percent of All Owners | Cumulative Percent |
|---|---|---|---|
| 0 | 5 | 0.2 | 0.2 |
| 1 | 10 | 0.3 | 0.5 |
| 2 | 18 | 0.6 | 1.1 |
| 3 | 9 | 0.3 | 1.4 |
| 4 | 17 | 0.6 | 1.9 |
| 5 | 9 | 0.3 | 2.2 |
| 6 | 12 | 0.4 | 2.6 |
| 7 | 14 | 0.5 | 3.1 |
| 8 | 17 | 0.6 | 3.6 |
| 9 | 7 | 0.2 | 3.9 |
| 10 | 10 | 0.3 | 4.2 |
| 11 | 20 | 0.7 | 4.8 |
| 12 | 19 | 0.6 | 5.5 |
| 13 | 10 | 0.3 | 5.8 |
| 14 | 21 | 0.7 | 6.5 |
| 15 | 16 | 0.5 | 7.0 |
| 16 | 18 | 0.6 | 7.6 |
| 17 | 12 | 0.4 | 8.0 |
| 18 | 16 | 0.5 | 8.5 |
| 19 | 19 | 0.6 | 9.1 |
| 20 | 8 | 0.3 | 9.4 |
| 21 | 20 | 0.7 | 10.1 |
| 22 | 15 | 0.5 | 10.5 |
| 23 | 18 | 0.6 | 11.1 |
| 24+ | 793 | 26.0 | 37.1 |
| Has not sold | 1,920 | 62.9 | 100.0 |

N= 3,053

Notes: This table displays the percentage and cumulative percentage of owners selling their properties in non-foreclosure sales by the number of months elapsed since purchase. This table excludes the 248 owners in our main sample who lost their properties to foreclosure. The primary data for this table come from a dataset of property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses or condominium units between 1998 and 2006.

**Figure 3:** Owners Selling within 24 Months of Purchase




Note: This figure displays the percentage of owners who sold their properties through non-foreclosure sales, broken down by type of ownership and the year the owner purchased. Only non-foreclosure transactions are considered as sales in these estimates. The underlying data for this figure come from a dataset of property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses or condominium units between 1998 and 2006. We use data from the City of Chelsea Assessing department to distinguish between owners who receive their tax bills at the property in question (occupant-owners) and those who receive bills at other physical addresses (investors).

**Table 5:** Sample means for Macroeconomic Controls and Loan-to-Value Ratios

| | Mean | Standard Deviation | Min | Max |
|---|---|---|---|---|
| Unemployment rate, lagged one year | 6.3 | 1.5 | 3.4 | 10.1 |
| Percentage point change in unemployment rate over past year | 0.3 | 1.6 | -2.7 | 3.6 |
| Percentage change in local house price index, over past year* | 6.8 | 15.3 | -31.1 | 27.1 |
| 6 Month LIBOR, lagged one year | 4.0 | 1.9 | 1.2 | 6.9 |
| Combined Loan-to-Value Ratio at Purchase † | 84.8 | 25.2 | 0.0 | 110.0 |

†Winsorized at 97th percentile.

Notes: This table displays the mean values of time-varying macroeconomic factors and time-invariant combined loan-to-value ratio at purchase. For clarity, LTV is shown on a 0% to 110% scale in this table, but in our model it was coded ranging from 0 to 1.1. The house price index was calculated by the authors using a weighted repeat-sales methodology and is based on sales of 1-3 family and condo properties in Chelsea, Everett, and Revere. Quarterly unemployment and LIBOR values were derived from averaging monthly estimates. House price and loan-to-value data are derived from the Warren Group dataset, and unemployment statistics are from the U.S. Bureau of Labor Statistics.

**Table 6:** Results of Competing Risks Model Predicting Foreclosure and Non-Foreclosure Sale Hazards

| | **Model 1** | | **Model 2** | | **Model 3** | | **Model 4** | |
|---|---|---|---|---|---|---|---|---|
| | Foreclosure | Sale | Foreclosure | Sale | Foreclosure | Sale | Foreclosure | Sale |
| Lagged Unemployment Rate | 0.15 | -0.21*** | 0.15 | -0.21*** | 0.15 | -0.21*** | 0.14 | -0.21*** |
| | (0.15) | (0.04) | (0.15) | (0.04) | (0.15) | (0.04) | (0.15) | (0.04) |
| Unemployment Change | -0.09 | -0.14*** | -0.09 | -0.14*** | -0.09 | -0.14*** | -0.08 | -0.14*** |
| | (0.11) | (0.03) | (0.11) | (0.03) | (0.11) | (0.03) | (0.11) | (0.03) |
| House Price Change | -0.02* | 0.02*** | -0.02* | 0.02*** | -0.02* | 0.02*** | -0.02* | 0.02*** |
| | (0.01) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) |
| Lagged 6-Month LIBOR | 0.26 | -0.24*** | 0.26 | -0.24*** | 0.26 | -0.24*** | 0.24 | -0.24*** |
| | (0.15) | (0.03) | (0.15) | (0.03) | (0.15) | (0.03) | (0.15) | (0.03) |
| Investor | -0.15 | 0.22** | 0.06 | 0.40*** | | | | |
| | (0.20) | (0.08) | (0.23) | (0.10) | | | | |
| Local Investor | | | | | 0.41 | 0.46*** | 0.57* | 0.46*** |
| | | | | | (0.26) | (0.12) | (0.26) | (0.12) |
| Non-local Investor | | | | | -0.54 | 0.34** | -0.36 | 0.35** |
| | | | | | (0.39) | (0.13) | (0.40) | (0.13) |
| Condominium | | | -0.99*** | 0.05 | -0.99*** | 0.05 | -0.62*** | 0.08 |
| | | | (0.15) | (0.07) | (0.15) | (0.07) | (0.16) | (0.07) |
| Subprime Purchase Mortgage | | | | | | | 1.96*** | 0.41* |
| | | | | | | | (0.36) | (0.17) |
| Combined LTV at Purchase | | | | | | | 2.07* | -0.66** |
| | | | | | | | (0.98) | (0.22) |
| Investor x Condominium | | | -0.55 | -0.49** | -0.26 | -0.46** | -0.17 | -0.47** |
| | | | (0.49) | (0.17) | (0.51) | (0.18) | (0.52) | (0.18) |
| CLTV x Time | | | | | | | -0.04 | 0.04** |
| | | | | | | | (0.04) | (0.01) |
| Subprime x Time | | | | | | | -0.05* | -0.01 |
| | | | | | | | (0.02) | (0.01) |
| Constant | -13.67*** | -2.95*** | -13.62*** | -2.98*** | -13.64*** | -2.98*** | -16.12*** | -2.49*** |
| | (1.34) | (0.41) | (1.35) | (0.41) | (1.35) | (0.41) | (1.65) | (0.45) |
| Log Likelihood | -7189.21 | | -7154.84 | | -7151.85 | | -7092.51 | |

* $p < .05$, ** $p < .01$, *** $p < .001$

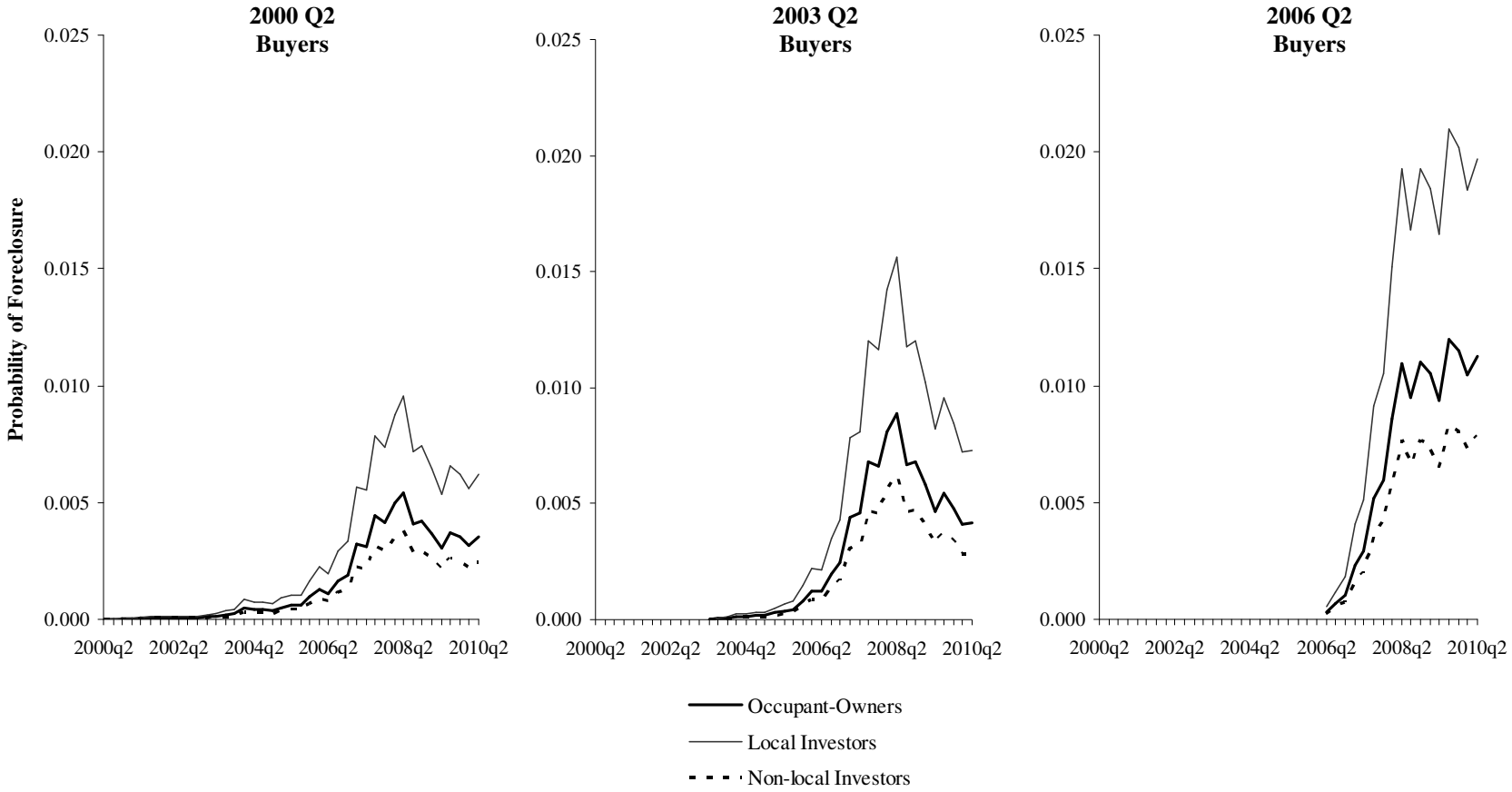
Notes: This table reports coefficients and standard errors (in parentheses) for competing risks models of foreclosure and non-foreclosure sales for ownerships initiated between 1998 and 2006. All specifications include a cubic polynomial of time and quadratic cohort effects.

**Table 7:** Foreclosure Hazards as of 2008 Q2 (Peak of Foreclosure Activity in Chelsea)

| | **No Subprime Mortgage at Purchase** | | | | | |
|---|---|---|---|---|---|---|
| | **1-3 Family** | | | **Condo** | | |
| **Buyer Cohort** | **Occupant-Owner** | **Local Investor** | **Non-Local Investor** | **Occupant-Owner** | **Local Investor** | **Non-Local Investor** |
| 2000 Q2 | 0.006 | 0.010 | 0.004 | 0.003 | 0.005 | 0.002 |
| 2003 Q2 | 0.009 | 0.016 | 0.006 | 0.005 | 0.007 | 0.003 |
| 2006 Q2 | 0.011 | 0.020 | 0.008 | 0.006 | 0.009 | 0.004 |
| | **Subprime Mortgage at Purchase** | | | | | |
| | **1-3 Family** | | | **Condo** | | |
| **Buyer Cohort** | **Occupant-Owner** | **Local Investor** | **Non-Local Investor** | **Occupant-Owner** | **Local Investor** | **Non-Local Investor** |
| 2000 Q2 | 0.009 | 0.015 | 0.006 | 0.005 | 0.007 | 0.003 |
| 2003 Q2 | 0.024 | 0.042 | 0.017 | 0.013 | 0.019 | 0.008 |
| 2006 Q2 | 0.050 | 0.085 | 0.035 | 0.028 | 0.041 | 0.016 |

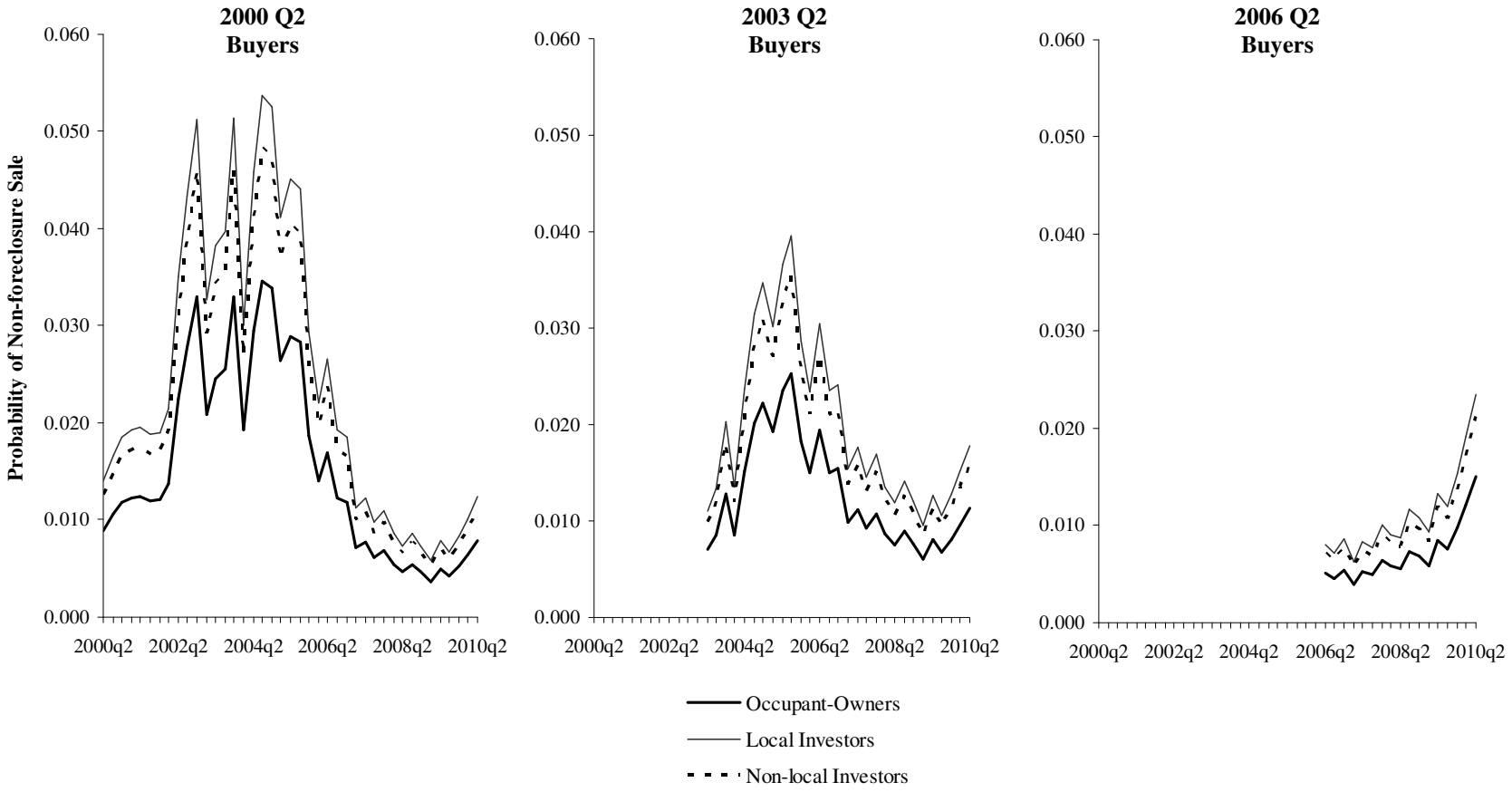
Notes: This table reports predicted foreclosure hazards for 2008Q2 based on estimates found in Model 4 of Table 6. Estimates are based on mean CLTV and contemporaneous unemployment, house price, and LIBOR values.

**Figure 4:** Foreclosure Hazard for 1-3 Family Property Owners without Subprime Loans at Purchase




Notes: This set of figures displays the estimated quarterly foreclosure hazards through the second quarter of 2010 for occupant-owners, local investors, and non-local investors who purchased in the second quarters of 2000, 2003, and 2006. Estimates apply to owners of 1-3 family properties who did not use a subprime mortgage at purchase. Estimates are based on mean CLTV and contemporaneous unemployment, house price, and LIBOR values.

**Figure 5:** Non-foreclosure Sale Hazard for 1-3 Family Property Owners without Subprime Loans at Purchase




Notes: This set of figures displays the estimated quarterly non-foreclosure sale hazards through the second quarter of 2010 for occupant-owners, local investors, and non-local investors who purchased in the second quarters of 2000, 2003, and 2006. Estimates apply to owners of 1-3 family properties who did not use a subprime mortgage at purchase. Estimates are based on mean CLTV and contemporaneous unemployment, house price, and LIBOR values.

**Table 8:** Investment by 1998-2006 Purchasers of 1-3 Family Properties

| | | | Total Value of Work (2010 Dollars) | | | |
|---|---|---|---|---|---|---|
| | N | % with Permits | Median | Mean | Standard Deviation | Means as % of Purchase Price |
| Occupant-Owners | 1,518 | 51% | $8,708 | $17,622 | $31,614 | 4% |
| Local Investors | 139 | 57% | $11,250 | $22,642 | $36,388 | 10% |
| Non-Local Investors | 124 | 49% | $10,612 | $20,598 | $32,988 | 8% |
| **All Owners** | **1,781** | **51%** | $9,145 | $18,200 | $32,091 | 5% |

Notes: This table reports the percentage of ownerships that obtain building permits and summary statistics on the reported value of the proposed work for the subsample of ownerships obtaining permits. Data are from a dataset of property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses between 1998 and 2006. We use data from the City of Chelsea Assessing department to distinguish between owners who receive their tax bills at the property in question (occupant-owners) and those who receive bills at other physical addresses (investors). Permit data is from the City of Chelsea Inspectional Services departments.

**Table 9:** Tenure and Investment by Flip Status for 1998-2006 Purchasers of 1-3 Family Properties

| | **Flip** | | **Non-Flip** | | **Total** | |
|---|---|---|---|---|---|---|
| Occupant-Owners | 143 | 72% | 1,375 | 87% | 1,518 | 85% |
| Local Investors | 32 | 16% | 107 | 7% | 139 | 8% |
| Non-Local Investors | 25 | 13% | 99 | 6% | 124 | 7% |
| **Total** | 200 | 100% | 1,581 | 100% | 1,781 | 100% |
| Owners with Building Permits | 63 | 32% | 849 | 54% | 912 | 51% |
| Owners with Building Permits in first 2 years | 63 | 32% | 498 | 31% | 561 | 31% |

Notes: This table reports the percentage of 1-3 family property ownerships that are flipped by the type of ownership. Flips are defined as ownership periods of less than 24 months. In the lower panel, we compare the percentage of ownerships that obtain building permits at any point during the ownership according to whether the owners flipped or not. To make the comparison more symmetric, we further restrict these counts and percentages in the bottom row to instances in which building permits are obtained *in the first 2 years of the ownership*. Data are from property-level transactions assembled by the Warren Group for all owners who purchased 1-3 family houses between 1998 and 2006. We use data from the City of Chelsea Assessing department to distinguish between owners who receive their tax bills at the property in question (occupant-owners) and those who receive bills at other physical addresses (investors). Building permit data is from the City of Chelsea Inspectional Services department**.**

**Appendix: Determining Tenure**

We used several data sources to determine whether each owner was an occupant-owner or investor. We began by comparing each property's address with its owner's physical mailing address. We use the address to which property tax bills are sent (from the Assessor's database) as the owner's address. When the owner's address matches the property's address, we classify him or her as an occupant-owner. When the addresses do not match, we classify the owner as an investor.[xvi] This method made it possible for us to determine tenure of 84% of owners who purchased between 1998 and 2006. In some cases, address data were incomplete, or mail was sent "care of" a recipient other than the owner or to a post office box in Chelsea. In these cases, we looked to other data sources.

If an owner's tenure type could not be determined using the address-based approach, we next checked to see if an owner had filed a Declaration of Homestead with Suffolk County. Under Massachusetts law, a homeowner can protect her home from creditors by filing a Declaration of Homestead with the county Registry of Deeds.[xvii] An owner of multiple properties can file the Declaration for only one estate, her primary residence. Owners who have filed Declarations at any time during their ownership experience are classified as occupant-owners. Declarations are a sufficient, but not necessary, indicator of occupant-ownership. Although filing the Declaration of Homestead offers substantial protection from select creditors, not all homeowners choose to file a Declaration, which currently requires a $35 fee in Massachusetts. Therefore, Declarations are a sufficient, but not necessary, indicator of owner-occupancy.

If an owner's mailing address was not available *and* she had not filed a Declaration of Homestead, we next checked to see if she received a residential property tax exemption. In 1989 the Massachusetts legislature granted localities the option to offer property tax abatements for local homeowners (Wallin 2004, p. 43). Chelsea is one of fourteen cities in Massachusetts that has enacted a residential property tax exemption (Massachusetts Department of Revenue 2009).[xviii] For the analysis in this paper, an owner is considered to be an occupant-owner if he or she received the exemption at any point during her ownership experience. Although there investors have a financial incentive to deceive the City about their occupancy (which may lead the exemption data to overestimate homeownership), the City regularly revokes exemptions, which tempers this bias. In addition, not all homeowners take advantage of the savings by applying for the exemption, so like Declarations of Homestead, the absence of a tax exemption is not conclusive evidence that an owner is an investor.

For owners with ambiguous or incomplete address data, no Declaration of Homestead, and no record of receiving a property tax exemption, we finally turned to 1998-2006 Home Mortgage Disclosure Act data, which have been matched to the Warren Group transactions data by researchers at the Federal Reserve Bank of Boston's Research Department. The HMDA data offer a number of details on loan and borrower traits, including the owner's occupancy status, specifically, whether the borrower intends to occupy the property as her primary residents. Overall, HMDA data are available for 80% of loans originated in the U.S. (Gerardi and Willen 2009, p. 10, citing Avery, Brevoort, and Canner 2006). Gerardi and Willen merge the HMDA data with the Warren Group dataset "based on the dollar amount of the mortgage, the Census tract in which the borrower lives, the identity of the mortgage lender, whether the mortgage was

a refinance or for a purchase, and finally the date of the mortgage," (Gerardi and Willen 2009, p. 10). Gerardi and Willen's overall match rate for Massachusetts mortgages is about 60%, though for about 70% of owners they are able to match data for at least one mortgage. Considering that the HMDA data do not cover all mortgages originated, these match rates are effectively better than 60 and 70%. The overall match rate in Chelsea is better than in Massachusetts as a whole. Among owners in our dataset, over 85% had one or more mortgage with a HMDA match.[xix]

The HMDA occupancy indicator does have an inherent bias, with investors often misidentified as occupant-owners. Investors may misrepresent themselves as occupant-owners to receive better financing terms, or they may be misclassified due to incomplete documentation.[xx] In our sample it appears that the HMDA indicator misclassifies over 41% of our investors as occupant-owners, while mistaking less than 3% of our occupant-owners as investors. However, we feel it is an acceptable "last resort" indicator.

As shown in Table A1, by combining the address-based method with Declarations of Homestead, tax exemption records, and HMDA data, we are able to identify tenure for 97.5% of owners in our database. We drop from our analysis the remaining 11 owners whose tenure type cannot be determined.

**Table A1:** Determining Tenure of Owners

| | | Data Used to Determine Tenure | | | Tenure Determined | |
|---|---|---|---|---|---|---|
| Purchase Year | All Buyers* | Owner's Address | Declaration of Homestead or Tax Exemption | HMDA | Number | Percent |
| 1998 | 314 | 251 | 22 | 24 | 297 | 94.6 |
| 1999 | 356 | 276 | 27 | 35 | 338 | 94.9 |
| 2000 | 315 | 251 | 26 | 29 | 306 | 97.1 |
| 2001 | 304 | 255 | 23 | 17 | 295 | 97.0 |
| 2002 | 347 | 287 | 33 | 23 | 343 | 98.8 |
| 2003 | 330 | 276 | 39 | 10 | 325 | 98.5 |
| 2004 | 538 | 461 | 47 | 26 | 534 | 99.3 |
| 2005 | 523 | 466 | 27 | 19 | 512 | 97.9 |
| 2006 | 357 | 309 | 21 | 21 | 351 | 98.3 |
| **Total** | **3,384** | **2,832** | **265** | **204** | **3,301** | **97.5** |

* Note: 42 additional owners were excluded because they held their properties for fewer than 7 days.

No data sources offer perfect indicators of tenure. We prefer the address-based method of determining tenure as the primary method for three main reasons. First, it seems to have the least amount of systematic bias toward investors or occupant-owners. Second, for most researchers and community stakeholders, data on owners and their mailing addresses is more easily available than HMDA data matched to owners or tax exemptions. Third, it is largely complete and includes data on owners going back far in time. In our case, we were able to obtain address on owners going back to the 1970s (though we only used data from 1998 forward). In contrast, owners who hold properties for short periods of time may fail to file for Declarations of Homestead or residential property tax exemptions, and those without mortgages will, of course, not be found in HMDA data.

To differentiate between local and non-local investors, we used the address data when possible. Even when an owner's address for the property in question was unclear, often we could find the correct address for that owner if she owned other properties in Chelsea. When this method failed, we examined the place of residence reported on deeds filed in the Suffolk Registry of Deeds online database.

[1] One exception appears to be the case of state homestead tax exemptions which can be used to distinguish homeowners and investors. For example, see Gatzlaff *et al*. (1998) in the context of Florida.

[2] "…HUD defines a "high-cost" loan to be a mortgage with an initial interest rate that is at least 300 basis points higher than the yield of a treasury bill with a comparable maturity period," (Gerardi et al., 2007, p. 6).

[3] Researchers at the Federal Reserve Bank of Boston who constructed the match have also verified the robustness of this method for determining subprime loans, finding that at approximately 93 percent of the loans determined to be subprime had common characteristics of nonprime loans, including initial interest rates of at least 200 basis points above an equivalent prime mortgage rate, or an interest rate margin at least 350 basis points above a typical benchmark (Foote et al., 2008, p. 295).

[4] Specific information about these datasets and the process by which we determine owners' tenure can be found in Appendix A.

[5] We excluded from this sample 42 owners who held their properties for less than 7 days, under the assumption that most of these reflect errors in the deeds data.

[6] One of the strengths of this approach is that we are able to check the address data and estimate the rate of false negatives and false positives when identifying investors. As discussed in the appendix, we take care to ignore address data and use alternative tenure indicators if tax bills are sent "care of" someone other than the owner or to post office boxes within Chelsea.

[7] Depken et al. choose 2 years as the threshold for a flip based on the fact that the federal tax code excludes capital gains from taxable income in a given year if owners used the house as a primary residence for two of the past 5 years.

[8] A larger percentage of local investors flipped their properties than either occupant-owners ($p < .0001$) or non-local investors ($p = .011$).

[9] Singer & Willet (2003) give a thorough explanation of the construction and utility of person-period datasets like ours.

[10] We compared our specification using time since purchase as a polynomial to a general specification using dummy variables for each time period. We settled on the more parsimonious polynomial version, which yields nearly identical results to the general specification. Similarly, while the macroeconomic predictors in our model are sensitive to the inclusion of cohort effects, we find that our findings on substantive predictors are highly robust to the inclusion or exclusion of the buyer cohort controls.

[11] See analysis by Foote et al. (2009) on income shocks and rapidly falling house prices as the primary determinant of foreclosure risk.

[12] Refer back to Table 3 for summary statistics on these covariates.

[13] Because decisions to refinance may reflect updated owner expectations about sale or foreclosure, we do not use subsequent information on CLTVs or loan type if a refinancing occurs during the ownership period.

[14] Removing the cohort controls renders both unemployment coefficients large and positive in predicting foreclosure risk. However, we continue to include the cohort controls, because they substantially improve model fit, and their inclusion does not alter the magnitude or significance of the tenure coefficients.

[15] Local investors experienced a mean annual rate of return of approximately 58%, as opposed to 42% among non-local investors and 37% among occupant-owners. The difference between occupant-owners and local investors is highly significant ($p = 0.015$), though the difference between local and non-local investors is only marginally significant ($p = 0.119$). Means reported were winsorized at the 2% and 98% levels to minimize the influence of outliers. We also calculate annualized returns for ownerships of 1-3 family properties for which we have building permit data and incorporate the expected dollar amount of investments in the calculation of returns. Local investors still receive a significantly higher return than occupant-owners.

[xvi] Care was taken to allow for variations in the formatting and numbering of addresses. When comparing this method of determining tenure to others methods explained in this paper and composited to form a single indicator, the address-based indicator performs relatively well. The address-based indicator seems to rarely classify properties as occupant-owned incorrectly (no more than 3%). The address-based indicator may be somewhat biased toward identifying properties as investor owned, though it seems that the upper-bound on this error is about 20%.

[xvii] The Declaration of Homestead does not protect an owner's home from being sold to resolve prior existing debts and debts owed for state, federal, or real estate taxes, or court orders for support of a spouse or minor children (Suffolk Registry of Deeds, 1999). In addition, first and second mortgages are considered exempted debts, which supersede the protections offered by the Declaration of Homestead (Barnstable Registry of Deeds).

[xviii] Each year the City of Chelsea must approve the exemption and choose the rate at which it will reduce taxable residential property values. Chelsea is permitted by the Massachusetts Legislature to exempt from taxation up to 20 percent of its average residential property value. This results in a uniform reduction in taxes, typically of $600 to $700 per year for each approved Chelsea homeowner. In order to claim the exemption, homeowners must apply at the City of Chelsea Assessor's Office and provide documents that prove owner-occupancy, such as utility bills. Homeowners continue to receive the exemption once they qualify, unless they sell the property or the City revokes the exemption, which occurs if the City learns the property is no longer owner-occupied.

[xix] 21 of the 104 non-matched ownership experiences (20%) have no mortgage on record in the Warren Group dataset with which to match HMDA data. Although the HMDA occupancy variable for tenure is sometimes missing, for the 304 owners with matched data, all had complete information on occupancy.

[xx] The occupancy field is sometimes listed as "not applicable", and it seems that the default value often assigned to a borrower is occupant-owner. According to Federal Financial Institutions Examination Council guidelines, properties should be classified in HMDA data as owner-occupied as a principal dwelling "unless the loan documents or application indicate that the property will not be owner-occupied as a principal residence," (2006, p. A-2).