Foreclosure, Federal Financial Institutions, and the Fortunes of Detroit's Middle- and Working-Class Neighborhoods

by

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LIST OF ABBREVIATIONS

APR annual percentage rate

ACA Asset Control Area

BRTF Blight Removal Task Force

CDC community development corporation

DASP Distressed Asset Sale Program

CCLRC Cuyahoga County Land Reutilization Authority

DLBA Detroit Land Bank Authority

DRPS Detroit Residential Parcel Survey

FHA Federal Housing Administration

FHFA Federal Housing Finance Agency

GSE government sponsored enterprise

GNND Good Neighbor Next Door

HAMP Home Affordable Modification Program

HARP Home Affordable Refinance Program

HCA hierarchical cluster analysis

HUD U.S. Department of Housing and Urban Development

ISR Institute for Social Research

LDA linear discriminant analysis

LLC Limited Liability Corporation

MBS mortgage-backed security

MERS Mortgage Electronic Registration Services

MSA metropolitan statistical area

MSHDA Michigan State Housing Development Authority

NCST National Community Stabilization Trust

NSI Neighborhood Stabilization Initiative

NSO Neighborhood Stabilization Outcome

NPV net present value

NSP Neighborhood Stabilization Program

PSA Pooling and Servicing Agreement

PTFA Protecting Tenants at Foreclosure Act

REO real estate owned

VA U.S. Department of Veterans Affairs

WCROD Wayne County Register of Deeds

ABSTRACT

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Chair: Professor Margaret Dewar

During the U.S. foreclosure crisis, millions of homes were foreclosed, with many repossessed by the banks and federal agencies owning or insuring the unpaid mortgages. Prior research has found strong associations between foreclosures and negative neighborhood outcomes, including increased crime and diminished home values. These outcomes are attributed to foreclosures being vacant and inadequately maintained, increasing neighborhood blight and leading nearby homeowners to disinvest. Each of these mechanisms is influenced by the practices of the banks and federal agencies that repossessed foreclosed homes, but these institutions and their practices have not yet been the subject of sustained research. This dissertation addresses this gap by examining how the institutions responsible for repossessed mortgage foreclosures—known as real estate owned properties, or REOs—manage their inventories in Detroit, which possessed one of the largest concentrations of REOs in the nation for several years.

Using real estate transaction records for the Detroit tri-county area from 2005 to 2013, along with policy analysis and interviews, I examine what happened to REOs in Detroit and its suburbs. In this study, I compare what happened with REOs owned by federal

agencies with those owned by private entities, as federal agencies possess a dual mandate to both quickly reduce inventory and stabilize neighborhoods. I compare federal agencies and private entities in terms of the share of sales they make to homebuyers and investors of different sizes, the length of time properties remain in REO, and impact current and former REOs have on nearby home values. I found that federal and private entities alike sold large numbers of Detroit homes to investors, many of whom were linked to code violations and tax delinquency. I also found that properties remained in HUD's inventory for lengthy periods, increasing the likelihood of deterioration. Further, I found that REOs owned by both federal and private entities were likely to harm home values. My findings indicate potential conflicts between federal agencies' dual mandates, with pressures to sell properties coming at the expense of neighborhood stabilization objectives. My findings also suggest that HUD's rules for conveying properties after foreclosure are linked to extended REO periods.

CHAPTER I

Introduction

Since the onset of the foreclosure crisis in the mid-2000s, a staggering number of residential properties have flowed into the inventories of the financial institutions and federal agencies owning, insuring, or servicing the mortgages used to purchase subsequently foreclosed properties. These mortgage-reverted properties—popularly known as "bank-owned properties"—are referred to in the real-estate industry as real estate owned (REO) properties. The geography of REO accumulation mirrors the national geography of mortgage foreclosure, with substantial concentrations in the exurban settlements feverishly developed during the creation of the housing bubble, as well as in the neighborhoods of older central cities where predatory lending triggered waves of foreclosures (Immergluck, 2010a). In the wake of the foreclosure crisis, a growing body of research has emerged concerned with the effects of foreclosures and REOs on the neighborhoods and municipalities in which they are located. The consensus of this research is that foreclosures impose negative externalities, pulling down property values and contributing to crime (Ellen, Lacoe, & Sharygin, 2013; Schuetz, Been, & Ellen, 2008). The bare fact of foreclosure alone, however, does not account for these externalities. Rather, they are the product of the interrelated problems of lengthy vacancy periods, poor property maintenance, heavily discounted sales prices, and the oversupply of homes on the market. Each of these mechanisms is influenced by the practices of the institutions responsible for REOs, but these

institutions and their practices have not yet been the subject of sustained research. This dissertation addresses this gap by examining how the institutions responsible for REOs manage their inventory in Detroit, which for several years has been among the cities with the largest concentration of REOs (Immergluck & Smith, 2006b).

Detroit is an important site for examining REOs for several reasons. Detroit, like similarly situated cities, retained a number of neighborhoods with stable, if not strong, housing demand prior to the mortgage foreclosure crisis. Since the onset of the foreclosure crisis, however, banks and federal agencies have come to be counted among these neighborhoods' largest property owners. How these institutions handle their inventories shapes critical dimensions of neighborhood health, including property values, tenure, and vacancy. These dimensions influence the decisions of neighborhood homeowners to remain and invest, the municipal allocation of city services, and the decisions of households contemplating moving to these neighborhoods. The preservation of these neighborhoods in cities like Detroit is important for several reasons, both moral and practical, but for the purposes of this research it is especially important to emphasize that these neighborhoods have for decades offered affordable and attractive housing options for middle- and working-class households otherwise unavailable within cities like Detroit. In their absence, households would likely prefer housing situated outside the city, further drawing resources away from municipalities desperately in need of them.

Conducting this research in Detroit possesses additional salience given the increasing prominence of urban regimes oriented toward urban management and market recovery through the identification and removal of blight (Kirkpatrick, 2015). In the race to remove blight, however, the mechanisms through which blight is produced require better understanding. Certainly secular processes of deindustrialization and suburbanization exacerbated by white racist attitudes toward housing integration have withdrawn jobs and people from Detroit, leading to housing abandonment and blight in many areas (Freund, 2010; Sugrue, 1996), but the resources and preferences of many households kept some

neighborhoods intact in the face of decades of population and job loss in Detroit. The incursion of blight into these neighborhoods is not an inexorable outcome of market forces or natural processes, but rather is mediated by numerous private and governmental institutions and their rules for governing foreclosures. By understanding these mechanisms, policy responses can be be tailored to the problem of blight reduction at numerous points of intervention, reducing reliance on demolition as a principle mechanism for stabilizing neighborhoods hit hard during the foreclosure crisis. Further, many REOs are controlled by federal agencies, including the two largest government sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, and the U.S. Department of Housing and Urban Development (HUD). Given this fact, the role of government in managing foreclosure and preventing blight is hardly limited to the local state. Federal institutions play a crucial role through their direct control of properties in vulnerable neighborhoods.

1.1 How Foreclosures Harm Neighborhoods

A substantial body of research links residential foreclosures to a number of negative outcomes for neighborhoods, particularly heightened crime and diminished home values (Ellen et al., 2013; Schuetz et al., 2008). These outcomes, in turn, have the potential to trigger or accelerate neighborhood disinvestment and decline in both the short- and long-term (Li & Walter, 2013). In this section, I will review the literature on these foreclosure-related spillovers, highlighting what is known about the neighborhood impacts of current and former REOs, which are the focus of my dissertation. Additionally, I will highlight what is known about the role of institutions, particularly the owners of REO properties, in mediating the neighborhood impacts of foreclosures. I will make the case that owners of REO properties preside over many of the mechanisms prior research establishes between foreclosures and neighborhood outcomes, but little is known about the manner in which these institutions handle REOs and the property- and neighborhood-level impacts of different institutional practices for managing and selling REOs.

The majority of studies examining the impact of foreclosures focus on changes in home sale prices, both for sales of foreclosed properties and for neighboring non-distressed sales. Looking first at the literature on foreclosure discounts, research indicates that foreclosures sell at a substantial discount relative to non-distressed sales (Campbell, Giglio, & Pathak, 2011; Clauretie & Daneshvary, 2009; Forgey, Rutherford, & VanBuskirk, 1994), or do not appreciate in value at the same rate as other homes Pennington-Cross, 2006. Initial studies of foreclosure discounts found that foreclosures sell at a discount of 20% or more (Carroll, Clauretie, & Neill, 1997; Forgey et al., 1994; Pennington-Cross, 2006). These studies, however, fail to account for neighborhood conditions. Home values, regardless of whether they are for REOs, are likely to be lower in neighborhoods with lower sale prices. Subsequent studies accounting for neighborhood context, among other covariates for which foreclosure may have served as a proxy in prior studies, predict a smaller discount. Clauretie and Daneshvary (2009), in their study of home sale prices in Las Vegas between 2004 and 2007, found that foreclosures sold at a discount of between 7.5% and 7.9%, all else being equal.

While these studies are primarily concerned with isolating the discount generated by foreclosure status alone, in their concern with removing the effect of other factors entangled with foreclosure status, they point to several reasons why sellers might intentionally sell foreclosures at discounts. Some scholars point out that sellers of foreclosed homes may set lower listing prices or accept lower bids should they desire shorter marketing times, lower carrying costs, or increased liquidity (Clauretie & Daneshvary, 2009; Frame, 2010). Sellers, of course, also set prices based on property conditions. Foreclosures in poor condition, which may have deteriorated due to vacancy and reduced investment by REO owners, sell at steep discounts. Discounted sale prices may also be a function of sellers' net present value (NPV) calculations, which involve comparing the expected returns generated from a quick sale with those generated from sales where properties are marketed for a longer time period, less carrying costs. Sellers' perceptions of negative housing mar-

ket trends would make them more likely to price properties at a discount to sell quickly, so as to avoid the possibility of realizing smaller net profits by incurring higher carrying costs. Immergluck (2012), in a study of REO sales in Atlanta, found that owners of REOs began to sell their inventory in lower-value neighborhoods at a substantially faster pace starting in 2008, indicating that sellers began pricing their properties at lower prices to make them move faster. In short, the literature assumes foreclosure discounts stem, at least in part, from the decisions of owners of REOs regarding whether or not to hold or liquidate inventory and whether or not to invest in improvements and maintenance, but little has been written about the decision-making calculus and observed practices of REO owners and how these actually impact foreclosure discounts.

Foreclosures also decrease the sale prices of nearby non-foreclosures, although scholars debate the magnitude and duration of the impact (Frame, 2010). Studies have found that the degree to which foreclosures impact the sale price of non-foreclosures depends on distance in time and space, with physically closer and more recent foreclosures imposing the largest discounts (Harding, Rosenblatt, & Yao, 2009; Lin, Rosenblatt, & Yao, 2007; Schuetz et al., 2008). Previous studies have also found that discounts depend on a property's stage in the foreclosure process, in particular, whether the property is a pre-foreclosure, current foreclosure, or former foreclosure (Harding et al., 2009; Lin et al., 2007; Kobie & Lee, 2011). REOs are found to impose substantially higher discounts than pre-foreclosures. In their study of foreclosure discounts in Cuyahoga County, Ohio, Kobie and Lee (2011) estimate that each additional REO on the same block as a non-distressed sale discounts that property's price by roughly 3%. The comparable discount imposed by pre-foreclosures is just 1.7%. The discounts imposed by foreclosures are generally found to persist for several years, extending even beyond the point of sale (Harding et al., 2009; Ihlanfeldt & Mayock, 2014).

To date, more effort has been put into estimating the size of the externalities imposed by foreclosures than examining the causes of these discounts. Many studies take

for granted the operation of one or more of a limited number of mechanisms through which foreclosures may generate discounts. The most commonly assumed mechanism through which foreclosures pull down nearby sale prices is property deterioration and blight (Coulton, Schramm, & Hirsh, 2008; Kobie & Lee, 2011; Whitaker et al., 2011, July). Pre-foreclosures and REOs alike may be vacant for long periods of time, providing opportunity for property deterioration. Blight caused by deterioration, in turn, may negatively impact the investment decisions of nearby property owners and the bid prices of prospective buyers. The causal link between blight and diminished home values in nearby areas has been accepted as truth in urban policy since at least the Progressive Era. This relationship is supported by a number of recent empirical studies (Shlay & Whitman, 2006; Whitaker et al., 2011, July). Whitaker et al. (2011, July), in their study of Cuyahoga County, Ohio, found that each additional nearby vacant property reduces home prices by 1.4%. Shlay and Whitman (2006) found similar results in Philadelphia, where abandoned properties pulled down nearby sale prices by thousands of dollars.

Previous research, then, provides a strong basis for the assumption that blight resulting from vacancy is the primary channel through which foreclosures impact nearby home sales. The assumption that REO status necessarily leads to blight, deterioration, and discounted neighborhood sale prices, however, leaves the role of REO owners in handling their properties unexamined. The results of Immergluck and Smith (2006a) suggest that differences among institutions responsible for REOs influence whether foreclosures generate these discounts. The authors found that foreclosures of properties purchased with Federal Housing Administration (FHA) insurance are not associated with nearby home sale prices, but foreclosures of properties purchased with conventional mortgages, on the other hand, had a statistically significant and negative association with nearby home sale prices. This finding suggests that systems for handling foreclosures differ between HUD and private lenders and servicers, but the authors do not comment on what these differences might be and how they encourage or discourage sale price discounts.

Institutional differences are also implicated in discounts imposed by former foreclosures, principally through the sale process (H. Thomas, 2015). Several studies find that foreclosures continue to impose discounts months, if not years, after foreclosure, even after sale. Rogers and Winter (2009), in their study of foreclosure externalities in St. Louis County, Missouri between 1998 and 2007, found that nearby foreclosures are linked to discounts of nearby home sales two years after foreclosure, the longest time period examined by the authors. Lin et al. (2007), in their study of spillovers in Chicago in 2003 and 2006, found that discounts remain fully five years after a foreclosure start. Many of these foreclosures were likely to have been sold during those time periods, although the authors do not examine whether properties had exited REO status. Harding et al. (2009), in a national study of foreclosure externalities from 1989 to 2007, estimated that the largest average discounts among pre-foreclosures, foreclosures, and post-foreclosures were imposed by former foreclosures, although results differed among metropolitan statistical area (MSA). Ihlanfeldt and Mayock (2014), in their study of externalities in several large Florida counties between 1998 and 2011, also found that externalities persisted after sale.

While these studies suggest the existence and magnitude of externalities differ based on the phase of the foreclosure process, they say little about the mechanisms driving differences or similarities. Community activists and practitioners, however, argue the heavy involvement of investors in the market for foreclosures drives the persistence of externalities after foreclosure, particularly in areas with weak housing markets. The strategies of investors in distressed properties, including foreclosures, include the acquisition of large inventories, sight unseen, with the intention of quickly reselling as many properties as possible at a substantial markup ("flipping"). Other investors are active in the market for foreclosures in the pursuit of cheap rental properties. Often, these investors make few, if any repairs, in the pursuit of short-term gains ("milking") (Ford et al., 2013; Mallach, 2010; Treuhaft, Rose, & Black, 2010). In one of the few systematic studies of differences

between REOs purchased by investors and those purchased by owner-occupants in terms of property conditions, (Hwang, 2015) found that among REOs in Boston purchased between 2006 and 2011, those purchased by investors were more likely to be associated with service requests and property neglect. In the only existing study to explicitly model differences in discounts based on the type of foreclosure buyer, Ihlanfeldt and Mayock (2014) found that former foreclosures purchased by investors generated larger discounts than foreclosures purchased by owner-occupants, although the discounts dissipated over time. The assumption that investor acquisitions of REOs is problematic is a central assumption of recent studies examining what happens to REOs after they are sold (Immergluck, 2012; Kim & Cho, 2016; McMillan & Chakraborty, 2016; Molina, 2015). These studies interpret larger shares of sales to investors, particularly in distressed neighborhoods, as problematic given the causal chain of reasoning discussed above.

Previous research also links foreclosures to increases in neighborhood crime, including both property crime, like graffiti and vandalism, and violent crime (Cui & Walsh, 2015; Ellen et al., 2013; Immergluck & Smith, 2006b). Foreclosure is thought to increase crime through several mechanisms. First, foreclosures, through their physical deterioration, may signal complacency among neighborhood residents about crime and social disorder. Second, foreclosures, by increasing residential turnover and decreasing homeownership, weaken informal social controls for preventing crime. Third, foreclosures, through vacancy, may encourage property theft and vandalism and provide cover for other criminal activities. These mechanisms, particularly the first two, stem from prior research on social disorganization theory, which links neighborhood characteristics like residential instability to diminished social cohension and control, eroding important mechanisms for preventing neighborhood crime (Sampson & Groves, 1989). Previous studies of the relationship between foreclosure and crime find that foreclosures lead to the greatest increases in crime when foreclosures have entered REO and/or they are vacant (Cui & Walsh, 2015; Ellen et al., 2013). These findings correspond to earlier research linking abandoned struc-

tures, regardless of the reason for abandonment, to increased crime (Spelman, 1993). The role of REO owners in mediating the visible insecurity and distress of foreclosures is not examined in this literature. Research by the National Fair Housing Alliance (2014a), however, suggests that several large REO owners poorly maintain and market properties in urban neighborhoods having a substantial share of minority residents in comparison to inventory owned in majority white neighborhoods. Such institutional practices, community activists fear, may accelerate social disorganization in neighborhoods with concentrated foreclosures and increase criminal activity.

These short- and medium-term impacts of foreclosures, including increases in blight, crime, and vacancy and decreases in home values and social capital can lead to more profound long-term neighborhood changes. While the literature on neighborhood change resulting from foreclosures is thin (for exceptions, see Li & Morrow-Jones, 2010; Baxter & Lauria, 2000), the theoretical connections between, first, blight, vacancy, residential turnover, and property speculation and, second, long-term neighborhood conditions are well established in the literature (G. Galster, 2001; Rohe & Stewart, 1996; Temkin & Rohe, 1998). Foreclosures of previously owner-occupied homes are commonly purchased by investors who then either convert them to rental housing or do nothing with them (Coulton et al., 2008; Ford et al., 2013) . Properties owned by REOs, particularly in urban majority-minority neighborhoods, may be neglected and exhibit property damage or other signs of disinvestment (National Fair Housing Alliance, 2014a). These outcomes can lead to declining neighborhood home prices, encouraging neighborhood property owners to reduce investment in their holdings and potentially pushing other homeowners underwater on their mortgages (i.e., when outstanding debt exceeds home value). These outcomes, in turn, potentially lead to further speculative activity and reduced homeownership in a vicious cycle of neighborhood decline. Thus, neighborhoods retaining desirable attributes preceding the foreclosure crisis are potentially susceptible to long-term, substantial declines in neighborhood conditions. Previous research on neighborhood change has been

concerned with identifying the points in the process of change where public policy may be able to intervene to arrest or reverse decline. This literature makes clear the role of institutions, particularly financial, governmental, and nonprofit, in helping prevent neighborhoods from declining or tipping past the point of recovery. This dissertation seeks to make a similar contribution by examining the role of REO owners in influencing the fortunes of middle- and working-class neighborhoods in older central cities like Detroit.

1.2 How REO Owners Handled Properties

As I have shown in the preceding section, foreclosures are clearly linked to negative neighborhood outcomes. The literature on the subject points to a number of mechanisms through which foreclosures generate these negative outcomes, but is largely silent on the role of REO owners in influencing the degree to which mortgage-reverted properties harm neighborhoods. In this dissertation, I argue that the ways in which REO owners handled their inventory in the years immediately following the peak of the mortgage foreclosure crisis had a large negative impact on middle- and working-class neighborhoods in Detroit and similarly situated cities. REO owners exercise substantial control over whether properties are likely to generate harmful spillovers at three principal points of phases of a property's overall duration in REO, specifically, (1) the point at which completed foreclosures are formally conveyed into REO inventory, (2) the period of REO ownership between conveyance and disposition, and (3) the point at which REOs are sold or otherwise disposed of. Practices specific to each of these three points in the life of an REO directly influence the condition, occupancy, and price of REOs—each of which, in turn, impacts neighborhood conditions. Not all REO owners, however, employ the same practices for receiving, managing, and disposing of mortgage-reverted properties. Lender and federal housing agency practices for each of these three phases of the REO lifecycle often overlap, but sometimes differ in crucial ways that are both more and less harmful for neighborhoods.

With regard to practices for taking receipt of foreclosed properties, I will argue that the timeliness for REO owners taking control of mortgage-reverted properties influences whether and how long they remain vacant, and therefore susceptible to deterioration. Specifically, I will argue that HUD's practices for taking control of foreclosed FHA-insured properties may be partially responsible for the lengthy period of time between foreclosure and REO disposition, during which these properties are vacant and vulnerable. While private entities and the GSEs take control of properties immediately after failed foreclosure auctions, HUD takes control of FHA-insured properties long after this point (U.S. Government Accountability Office, 2013). The primary reason for this is the fact that HUD only accepts foreclosed homes in "conveyable condition," meaning only after redemption periods have expired, title has been cleared, and the property is in "broom-swept condition" (U.S. Department of Housing and Urban Development, 2010b). This policy of requiring conveyable condition is intended to save HUD the costs of managing properties prior to the point at which they may be brought to market, but it leads to a divided approach to handling properties after foreclosure, which in turn substantially increases properties' time in REO. Additionally, HUD allows lenders to file insurance claims on FHA-insured foreclosures at any point after foreclosure, further increasing the time properties are likely to linger in inventory. Private entities and the GSEs, on the other hand, take control of properties immediately after failed foreclosure auctions. This unified approach to handling REOs between failed foreclosure auctions and disposition likely leads to shorter REO durations, decreasing the chances of properties sitting vacant for long stretches and harming neighborhood conditions. Other aspects of REO management and disposition, however, influence whether or not lender and GSE properties are indeed more or less likely to harm neighborhood conditions, as discussed below.

While properties remain in REO, their owners are directly responsible for their maintenance and preservation, which in turn influence whether properties become blighted and pull down nearby property values. Property maintenance and preservation also in-

fluence the type of buyer, with investors being far more likely to purchase properties that have been poorly maintained or require serious repairs (Herbert, Lambie-Hanson, Lew, & Sanchez-Moyano, 2013). Private and federal entities alike employ contractors to secure and maintain REOs prior to sale. These entities' hiring and oversight practices, as well as the standards to which they direct contractors to maintain properties, have a direct bearing on property conditions and neighborhood spillovers. In this dissertation, I will argue that REO owners, through either their failure to direct contractors to maintain REOs located in Detroit to neighborhood standards or their failure to adequately oversee contractors in order to ensure proper maintenance, may have contributed to the deterioration of decent housing in middle- and working-class neighborhoods. Such preventable deterioration, in turn, leads to diminished home values for foreclosures and nearby properties, decreased interest among prospective owner-occupants, increased sales to investors, and expanded public expenditures for demolition and other forms of nuisance abatement. Above and beyond basic property maintenance activities, such as mowing lawns and securing doors and windows, REO owners' decisions regarding repairs also influences whether properties sell to investors or owner-occupants. First, many, if not most prospective owner-occupants seek housing that can be occupied immediately or in the near-term. Second, many prospective owner-occupants may find it impossible to secure financing for homes requiring major repairs. I will argue that banks and federal housing agencies created a major barrier for prospective owner-occupants in the market for foreclosures by deciding against making repairs, as they instead preferred to make immediate cash sales and reduce the risk they would potentially be exposed to by holding properties for longer periods of time.

REO owners' policies and practices for selling and otherwise disposing of REO properties are also implicated in whether these properties are linked to negative neighborhood outcomes. Sales to investors, particularly in places with weak overall housing markets like Detroit, can have seriously negative consequences, as investors in these markets fre-

quently follow business models predicated on flipping, milking, and speculation (Mallach, 2010). Owner-occupied properties, on the other hand, help promote neighborhood stability more than vacant or poorly maintained rental properties (Rohe & Stewart, 1996). I will argue that the maintenance and sales practices of banks and federal housing agencies, however, create inducements for investors and barriers for prospective owner-occupants, particularly in cities like Detroit, and that these incentives and barriers had damaging consequences for historically intact neighborhoods. First, REO owners were more likely to engage in bulk sales in locations with large concentrations of foreclosures and where home values, in the aggregate, had fallen. In these locations, REO owners packaged and sold large numbers of REOs for pennies on the dollar in order to remove these properties from their portfolios. Private and federal entities alike sold geographically tailored packages of REOs to the highest bidder, without first vetting their capacity for returning properties to productive use. As a result, numerous predatory investors acquired large numbers of privately and federally owned REOs in Detroit and similarly situated cities. Many of these investors engaged in precisely those harmful practices previous research predicts they would. Many bulk buyers and other large investors rapidly resold properties at inflated prices, having made no improvements, prolonging property vacancy and creating opportunities for further deterioration. Investors allowed those properties they failed to flip to languish and deteriorate, eventually falling into public ownership through tax foreclosure. Other bulk buyers and large investors extracted rental income from properties while simultaneously withholding property taxes. Since repossession due to delinquent property taxes takes several years to occur, investors were able to reap substantial short-term returns, often many times more than their initial investment. Other bulk buyers and large investors sold properties on contract, a type of seller-financed home purchase arrangement. The terms of these sales, however, are harsh; they require buyers to improve properties so that they meet code, they impose extremely high interest rates, and they provide none of the homebuyer protections afforded by a conventional mortgage.

Properties sold on contract, therefore, often exhibit the same turnover and dilapidated property conditions as rental properties owned by milkers (e.g., Goldstein & Stevenson, 2016a).

Further numbers of REOs were likely sold to investors due to REO owners' practice of making few, if any repairs, particularly in locations like Detroit; pushing properties through an accelerated sales process; and selling properties "as-is." As noted above, prospective owner-occupants are generally more interested in purchasing move-in or near move-in ready properties. Homes with substantial deficiencies impose additional costs and delays for prospective owner-occupants many are not interested in or capable of dealing with. Further, lenders may not be willing to start new loans for such properties, as they provide insufficient collateral in their present condition. Many REO sellers also dictate that the sales process, including inspections and financing, take place on an accelerated—and sometimes impossible—timetable relative to conventional sales. The "as-is" clause, however, makes it essential for buyers to have properties thoroughly inspected. The meaning of "as-is" varies somewhat among REO owners, but it generally means that the buyer accepts the property in its present condition, with no guarantee as to the condition of the property, the quality of any repairs made by the seller, or the perfection of title. The "as-is" clause, therefore, poses substantial financial risk to the buyer and places investors, with greater appetite for risk and access to capital, at a distinct advantage over prospective owner-occupants (H. Thomas, 2015). The risks posed by the "as-is" clause are exacerbated by the limited disclosures about property conditions made to potential buyers.

1.3 Federal Entities' Dual Mandate

A central focus of this dissertation is a comparison of federal agencies and private entities in terms of how they handled their REO inventories and the implications of those practices for neighborhoods hit hard by the foreclosure process, specifically, those counted

among Detroit's historically intact middle- and working-class neighborhoods. My central purpose in making this comparison is to shed light on possible conflicts between federal housing agencies' dual mandates to (1) secure their agency-level financial safety and soundness and (2) expand homeownership opportunities and stabilize neighborhoods. Prior research has established, for instance, that large numbers of REOs were "dumped" as the foreclosure crisis deepened in 2008, with many of those properties sold to bad actors (Ford et al., 2013; Immergluck, 2012). But within this overall trend in REO dispositions, were federal agencies then or since able to secure better outcomes for the properties they held in their inventories, or did loss agency loss-mitigation concerns lead them also to offload large numbers of properties to bad actors? Federal agencies have adopted several programs intended to help prospective owner-occupants, government entities, and nonprofits purchase homes compete in the market for REOs. Were these programs able to help more homebuyers and socially motivated buyers purchase these properties? This dissertation inquires into how differences in mission and policies between federal agencies and private entities shaped the post-foreclosure trajectory of REOs in homeowner neighborhoods whose fortunes were dependent on the stewardship of mortgage-reverted properties in a manner consistent with best practices for neighborhood stabilization.

1.4 Overview of Dissertation

In Chapter II I present the the context of the study, specifically, post-war development in the Detroit tri-county area and the impact of subprime lending and mortgage foreclosure in the region. While Detroit lost large numbers of households and jobs to the suburbs over the past 60 years, it retained a number of intact middle- and working-class neighborhoods, but these were the hardest hit areas in the tri-county area. Chapter III discusses the pressures faced by federal agencies and private lenders as foreclosures mounted after 2006, and it discusses potential for conflict between federal entities' dual mandates of maintaining fiscal soundness and stabilizing neighborhoods. Chapter IV details how I

constructed a REO database from real estate transaction records, including the location of REO properties, the agencies or lenders responsible for them, the time they spent in REO, and the parties to whom they were sold. Using these databases, Chapter V provides an overview of federal and private ownership of REOs in the Detroit tri-county area. Chapter VI discuss how many properties were sold to investors and owner-occupants, and examines differences between federal and private entities over time and across space in terms of their likelihood of selling properties to owner-occupants, an important neighborhood stabilization objective. This chapter also examines the relationship between REOs purchased by investors and negative neighborhood outcomes, including tax foreclosure and blight violations. Chapter VII identifies the largest buyers of REOs in Detroit, sheds light on their business models, and discusses their how their practices may have harmed neighborhoods in Detroit. Chapter VIII examines how long properties remained in REO, which is important because REO durations are linked to property vacancy and blight. Chapter IX examines the impact of current and former REOs on nearby home sale prices, and Chapter X summarizes the key findings and discusses the policy implications of this research.

CHAPTER II

Post-War Development and the Mortgage Foreclosure Crisis in Detroit and Its Suburbs

2.1 Post-War Divergence of Detroit and Its Suburbs

This dissertation focuses on the Detroit tri-county metropolitan area, which consists of Macomb, Oakland, and Wayne counties. This region encompasses the City of Detroit and its inner-ring and primary outer-ring suburbs. This region has experienced substantial and spatially uneven changes in demographics and employment since World War II, with the City of Detroit having lost more than 60% of its 1950 population by 2010, while the tri-county area excluding Detroit grew by 170% during the same period (U.S. Bureau of the Census, 1952, 2010). In 1950, the year Detroit reached its peak population, the city boasted 1.85 million residents. Fueled by the growth of the auto industry, the regional importance of the wartime economy, and the influx of large numbers of foreign immigrants and African-Americans from the the U.S. South (Sugrue, 1996; Wilkerson, 2010), Detroit exhibited astonishing growth in the decades preceding 1950, when it grew from fewer than 500,000 residents in 1910 to nearly two million by mid-century (U.S. Bureau of the Census, 1913). In the decades since World War II, however, Detroit lost a substantial share of its population and jobs to the suburbs and Sunbelt. Suburbanization stemming from white racist attitudes toward the increasing numbers of African-Americans in Detroit and

federal policies privileging suburban development over inner-city investment drew large numbers of households out of Detroit (Freund, 2010; Jackson, 1985; Sugrue, 1996). Postwar job sprawl, regional industrial restructuring, and technological change eliminated large numbers of manufacturing jobs in Detroit and led to further rounds of population loss and the immiseration of many of Detroit's remaining residents (Bluestone & Harrison, 1982; Mouw, 2000; Sugrue, 1996). In 1970, roughly 11% of Detroit families were living under the poverty level (U.S. Bureau of the Census, 1970). By 2000, the year of the last decennial census prior to the onset of the mortgage foreclosure crisis, the poverty rate in Detroit had risen to 26%. In contrast, the poverty rate in 2000 for the tri-county area excluding Detroit was just 6.5% (U.S. Bureau of the Census, 2000). Median household income for Detroit in 1999 stood at $29,526, while the comparable figures for the two suburban counties to the north of Detroit, Macomb and Oakland County, were $52,102 and $61,907, respectively (U.S. Bureau of the Census, 2000).

These changes in population, employment, and income caused a major overall drop in demand for housing in Detroit. Between 1970 and 2000, Detroit lost roughly 30% of its housing units (U.S. Bureau of the Census, 1970, 2000). Much of this destruction stemmed from the relocation of residents to the suburbs (G. Galster, 2012). During the same period, the number of housing units in the tri-county area excluding Detroit grew by 51% (U.S. Bureau of the Census, 1970, 2000). As the rate of housing destruction lagged the loss of population, Detroit also exhibited a particularly high housing vacancy rate, which stood at 10% in 2000. The comparable figure for the tri-county area excluding Detroit was just 4% (U.S. Bureau of the Census, 2000). It is worth noting that the decreasing size of households after mid-century meant that housing demand was not falling as fast as population loss alone might suggest. The number of households in Detroit remained stable between 1950 and 1970, moving down just 3%. By 2000, the number of households in Detroit had dropped 34% from its 1960 peak (U.S. Bureau of the Census, 1952, 1961, 2000). While the magnitude of the loss of Detroit households was quite large, it remained smaller than

the roughly 50% decline in population the city experienced between 1950 and 2000 (U.S. Bureau of the Census, 1952, 2000).

Despite this post-war divergence of Detroit's central city and its suburbs, Detroit retained a number of neighborhoods where demand for housing remained stable, if not strong, through the years preceding the mortgage foreclosure crisis. Figure 2.1 shows the spatial distribution of household change in Detroit from 1970 to 2000. This map shows that neighborhoods experiencing the greatest disinvestment were clustered around the central business district, the Detroit River, and sections of the East Side. Other neighborhoods, particularly those on the West Side and on the periphery of the East Side, experienced far less disinvestment. Among Detroit census tracts that possessed at least 100 single-family detached housing units in 1970, 27% experienced a decline of no more than 5% of households and 15% experienced no change or positive growth (GeoLytics, Inc., 2003). These strong neighborhoods are generally characterized by a higher-quality housing stock, with far more of it built from brick and stone than housing in more depopulated places, where the majority of the stock was built with light wood framing to quickly accommodate the growing workforce at mid-century (McCulloch, 2015). Many of these stronger neighborhoods retained residents deeply attached to their homes, neighborhoods, and the spatially embedded social networks to which they belonged. Residents of these neighborhoods often organized to preserve environmental conditions and quality-of-life in the face of public service reductions.[1] As a result, many of these strong neighborhoods possessed housing vacancy rates prior to the mortgage foreclosure crisis similar to those observed in Detroit's suburbs, as evidenced in Figure 2.2. Fully one-quarter of predominantly residential census tracts possessed a vacancy rate of between 0 and 6% (GeoLytics, Inc., 2003). In order to distinguish between Detroit's strong neighborhoods and others, I employed a technique for using census data to group similar area based on their values on selected

[1]It should be noted that Detroit residents' organizing to "protect" their neighborhoods was sometimes motivated by a concern for preserving white racial composition during a post-war period of increasing racial transition (J. M. Thomas, 2013).

indicators of housing market strength between 1990 and 2000 (see Section 4.5). See Table 2.1 for the median and range of values for key housing market indicators in Detroit's strong neighborhoods and its suburbs.

2.2 Subprime Lending and Mortgage Foreclosures in the Detroit Tri-County Area

Despite the often hard-won maintenance and improvement of many central city neighborhoods in the post-war period, the emergence and expansion of subprime lending in the 1990s and subprime sellers' penetration of central city housing markets came to threaten these neighborhoods' continued existence as stable enclaves for middle- and working-class homeowners (Crump et al., 2008; Immergluck, 2011). Subprime loans are distinguished from conventional loans by a risk-based premium charged by lenders to borrowers unable to qualify for conventional loans. The higher cost of subprime loans, however, makes them more difficult for many borrowers to repay, leading to higher rates of foreclosure. Subprime home loans remained a relatively obscure financial instrument until the 1990s, when changes in the regulation and structure of housing finance led to a boom in subprime lending. The rise of private-label mortgage securitization, wherein home loans originated by lenders were acquired in bulk by Wall Street firms, packaged into mortgage-backed securities (MBSs), and sold to outside investors, along with the rise of private mortgage companies immune from the regulatory oversight paid to depository institutions, were particularly influential in creating the vast market for subprime loans (Ashton, 2010). Investors and Wall Street financial institutions, hungry for the high yields of subprime loans and possessed of a false sense of security promoted by compromised ratings agencies, generated high levels of demand for the product. To meet this demand, mortgage brokers, who were also paid a premium for starting high-cost loans, steered borrowers eligible for conventional loans into subprime loans and originated subprime

loans for borrowers clearly lacking the ability to repay them (Immergluck, 2011).

In places like Detroit, the majority of subprime loans were issued to refinance prior mortgages. As home prices rose in the 1990s, mortgage brokers took advantage of central city homeowners, many of whom possessed more equity in their home than they possessed in other forms of personal wealth. Borrowers seeking to refinance to pay for home improvements, medical costs, or other personal expenses were steered into high cost loans. When home values stopped rising, many borrowers could not refinance their way out of high-cost loans and, of those borrowers, many could not make their loan payments after interest-rate resets and balloon payments came due (Immergluck, 2011). As home prices began to fall in the mid-to-late-2000s, many borrowers were pushed underwater, meaning their outstanding loan balance exceeded the market value of their property, leading to large numbers of defaults (Woolsey, 2008). In other cases, loss of work or other unanticipated financial difficulties on top of onerous loan terms made it impossible for borrowers to make their mortgage payments (Collins, 2003). Between 2004 and 2006 alone, the three years when subprime lending exceeded 20% of the national mortgage market (Financial Crisis Inquiry Commission, 2011), 13% of Detroit's housing units were linked to a subprime mortgage origination, either for home purchase or refinance. The comparable figure for the tri-county area excluding Detroit (and Hamtramck and Highland Park, the two cities contained within Detroit) was just 8% (U.S. Board of Governors of the Federal Reserve System, 2004, 2005, 2006; U.S. Bureau of the Census, 2000).[2]

The spatial distribution of subprime lending in Detroit, however, was concentrated among the city's stable residential areas where homeowners had been able to build equity (see Figure 2.3). Nearly 20% of housing units in these areas (18.6%) were linked to subprime home loan starts during this period, with roughly half of them being linked to subprime refinancing (see Table 2.1) (U.S. Board of Governors of the Federal Reserve

[2]I identified originated loans as subprime where the lender was required to report the spread, which they must do when the difference between the annual percentage rate (APR) on the loan and the Treasury yield is at least 3% for first-lien loans or at least 5% for subordinate-lien loans (Pettit & Droesch, 2008).

System, 2004, 2005, 2006; U.S. Bureau of the Census, 2000). In addition to this large difference in the rate of subprime lending between Detroit's strong neighborhoods and its suburbs, there was also a smaller difference between Detroit's inner- and outer-ring suburbs (the definition of these areas is found in Section 4.5). Between 2004 and 2006, 10% of housing units in inner-ring suburbs were linked to subprime loans, while the comparable figure for outer-ring suburbs was slightly lower at 7%. Subprime lending, therefore, created an uneven regional geography of risk for foreclosure and neighborhood decline, one echoing the spatial patterning of historical financial injustices, particularly the refusal of lending institutions to lend in inner-city and minority-occupied neighborhoods ("redlining") (Ashton, 2010; Crump et al., 2008). While the exact neighborhoods that were affected within Detroit during the subprime crisis were different than those subject to redlining at mid-century—these were clustered in the inner-city—subprime lending victimized many of the same kinds of people.

The number of mortgage foreclosures, many stemming from subprime loans, exploded in Detroit in the mid- to late-2000s. Between 2005 and 2013, the number of completed mortgage foreclosures in Detroit exceeded 70,000 (CoreLogic, 2010; Wayne County Register of Deeds, 2014).[3] Mortgage foreclosures during this period occurred on more than 65,000 distinct residential properties in Detroit, or roughly 26% of the city's housing stock (CoreLogic, 2010; Data Driven Detroit, 2010; Wayne County Register of Deeds, 2014). The number of mortgage foreclosures completed annually grew steeply from 2005 to 2007, climbing from 6,660 to 15,192—a 128% increase (see Figure 2.4). The rising number of mortgage foreclosures in Detroit propelled the entire metropolitan area to the top of the list of regional foreclosure rates in 2007, when the metro-level foreclosure rate was roughly five times the national average (Rooney, 2008). This sharp rise in foreclosures during these

[3]Determining the precise number of completed foreclosures in Detroit and other jurisdictions is complicated by a number of factors. This topic is discussed in detail in Chapter IV, where I discuss my data sources and how I used them to identify foreclosures and REO properties. Estimates of completed foreclosures in this dissertation exclude alternatives to foreclosure sometimes available to delinquent borrowers, including short sales and deeds-in-lieu-of-foreclosure.

years is due in large part to the combination of interest rates resetting on subprime loans and the softening of home prices after the lengthy buildup of the national housing bubble. The number of mortgage foreclosures in Detroit fell from its 2007 peak value by roughly 25% by 2008 and 60% by 2009, after which the number of mortgage foreclosures completed annually gradually declined to just below 3,000 in 2013. In 2007, there were 60 mortgage foreclosures per 1,000 residential structures. By 2013, the figure had fallen to 12 mortgage foreclosures per 1,000 structures.

Foreclosure rates were highest in Detroit's historically strongest neighborhoods.[4] The median foreclosure rate—the number of distinct residential properties linked to a completed mortgage foreclosure between 2005 and 2013—among census tracts in Detroit's strong neighborhoods was 32% while the median among all other tracts was just 20%. The high foreclosure rates in Detroit's historically intact middle- and working-class neighborhoods are linked to the large volume of subprime lending they attracted relative to other Detroit neighborhoods, which possessed lower home values and fewer owner-occupied properties.

Mortgage foreclosures hit Detroit's inner- and outer-ring suburbs in the tri-county area at a much lower rate than they hit the city itself. Using the number of properties entering REO inventory in each of these areas between 2005 and 2013 as a proxy for completed foreclosures, 26% of housing units in Detroit's strong neighborhoods were subject to foreclosure, while the comparable figures for inner- and outer-ring suburbs are just 13% and 8%, respectively (RealtyTrac, 2015b; U.S. Bureau of the Census, 2000).[5] Much of this difference is due to the fact that Detroit's suburbs did not experience the same

[4]The methodology for identifying Detroit's strong neighborhoods, which are elsewhere referred to as the city's middle- and working-class neighborhoods, is presented in Section 4.4.

[5]I sometimes use different datasets to describe foreclosure and REO trends in Detroit alone than I use to compare Detroit to its suburbs. I do this because I possess slightly more accurate data for Detroit alone. As the focus of this dissertation is on REO properties, I expended more effort in identifying REO properties at the regional level than completed foreclosures alone. Using REOs as a proxy for foreclosures somewhat underestimates the true number of completed mortgage foreclosures, as a small share sell at the foreclosure auction. Using housing units as a denominator also underestimates the foreclosure rate, as not all housing units are mortgageable properties. For example, the many units in a multifamily structure constitute just a single mortgageable property.

surge in completed mortgage foreclosures between 2006 and 2008 (see Figure 2.5). Fewer subprime loans were originated in the suburbs relative to the total number of housing units, meaning fewer suburban properties were subject to onerous interest rate resets in the mid-2000s.

The regional spatial distribution of REOs is shown in Figure 2.6. This map shows the number of REO starts, at the tract level, between 2005 and 2013 divided by the number of mortgageable properties. Within the city of Detroit, strong neighborhoods exhibit the highest mortgage-reversion rates, as noted above. Inner-ring suburban tracts immediately adjacent to Detroit have similarly high mortgage-reversion rates. Within Macomb County, REO starts are concentrated along the I-94 corridor, continuing into the outer-ring suburbs and intensifying at the county's eastern boundary at New Haven. Within outer-ring suburban Oakland County, tracts located in the city of Pontiac exhibit the highest mortgage-reversion rates. Like Detroit, Pontiac is an older industrial city with a far higher percentage of low-income and minority residents than its more affluent neighbors, making it a greater target for subprime lending, although many of that city's foreclosures stemmed from landlord and and investor walkways (Oosting, 2009).

2.3 Changes in Regional Home Sale Prices

Between 2000 and 2015, the period covering the steepest inflation of the housing bubble, its collapse, and the initial recovery period, Detroit and its suburbs experienced enormous changes in home values and a highly uneven recovery. Figure 2.7 shows changes in median home sale prices for Detroit's strong neighborhoods and its inner- and outer-ring suburbs during this period. Each of these three areas exhibited a steep climb in sale prices between 2000 and 2005; home prices rose by 129% in Detroit's strong neighborhoods, 125% in Detroit's inner-ring suburbs, and 105% in Detroit's outer-ring suburbs. This precipitous increase in home prices reflected national trends, which saw prices climb and peak by mid-2006 (Bajaj, 2007). Starting in 2006, home prices in the Detroit region fell steeply, although

the rate of decline was far sharper in Detroit than its suburbs. In 2009, when home values reached their lowest both nationally and in the Detroit region, the median price in Detroit's strong neighborhoods had fallen 85% from its 2005 peak to just $12,000, closer for many to the price of a used car than a single-family home. Home prices fell somewhat less steeply in Detroit's inner-ring suburbs, where prices dropped 63% from their 2005 value to roughly $50,000. Home prices fell the least in Detroit's outer-ring suburbs, moving down 35% from their 2005 values to $125,000. Just as home values fell the steepest in the city of Detroit, so too was the home price recovery there the weakest. While home prices in Detroit's strong neighborhoods climbed by nearly 110% between 2009 and 2013, they and outer-ring suburbs were 47% and 100% above their 2000 values, respectively (prices not adjusted for inflation).

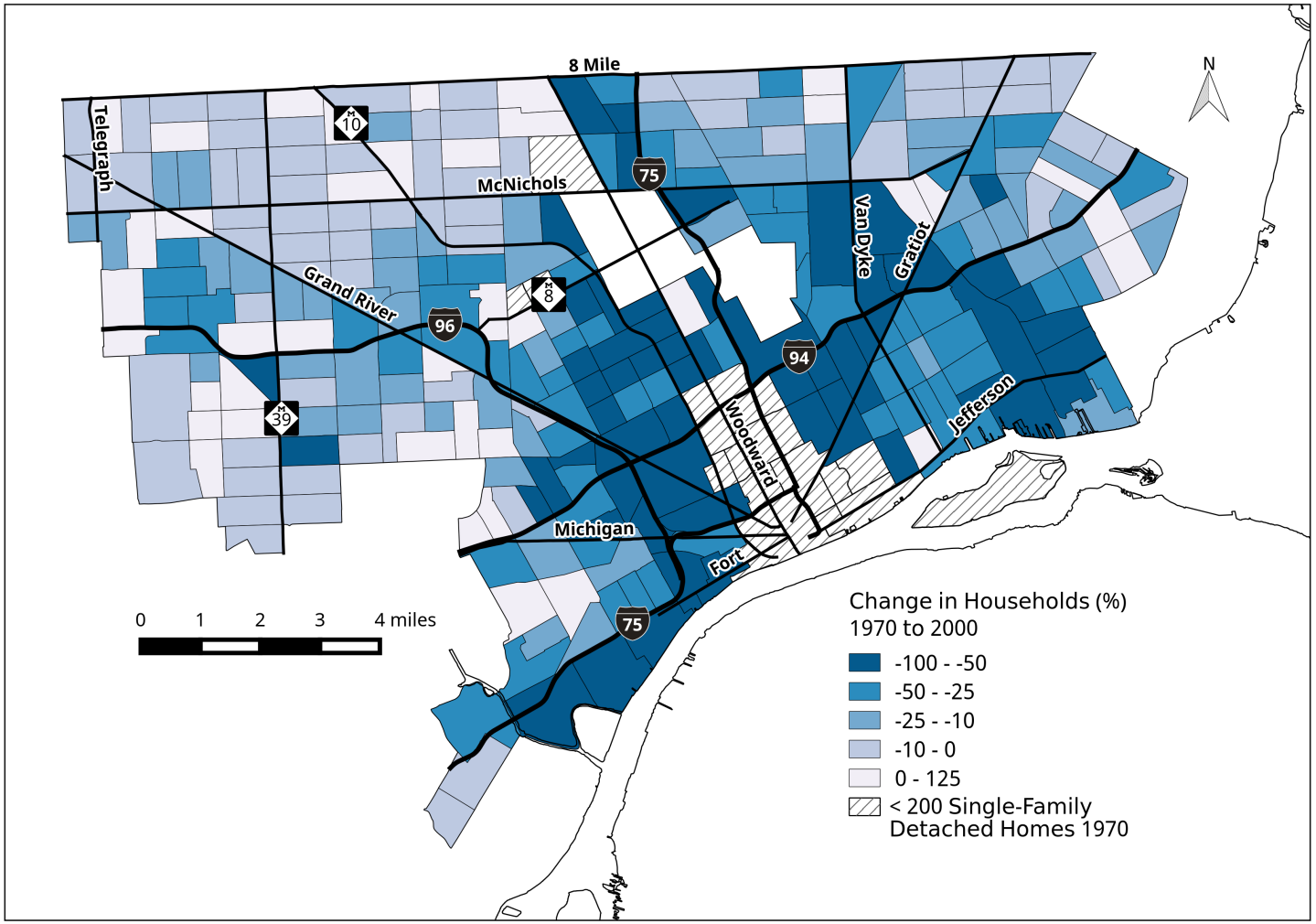

Figure 2.1: Percent Change in Detroit Households, 1970–2000. Source: GeoLytics, Inc., 2003.

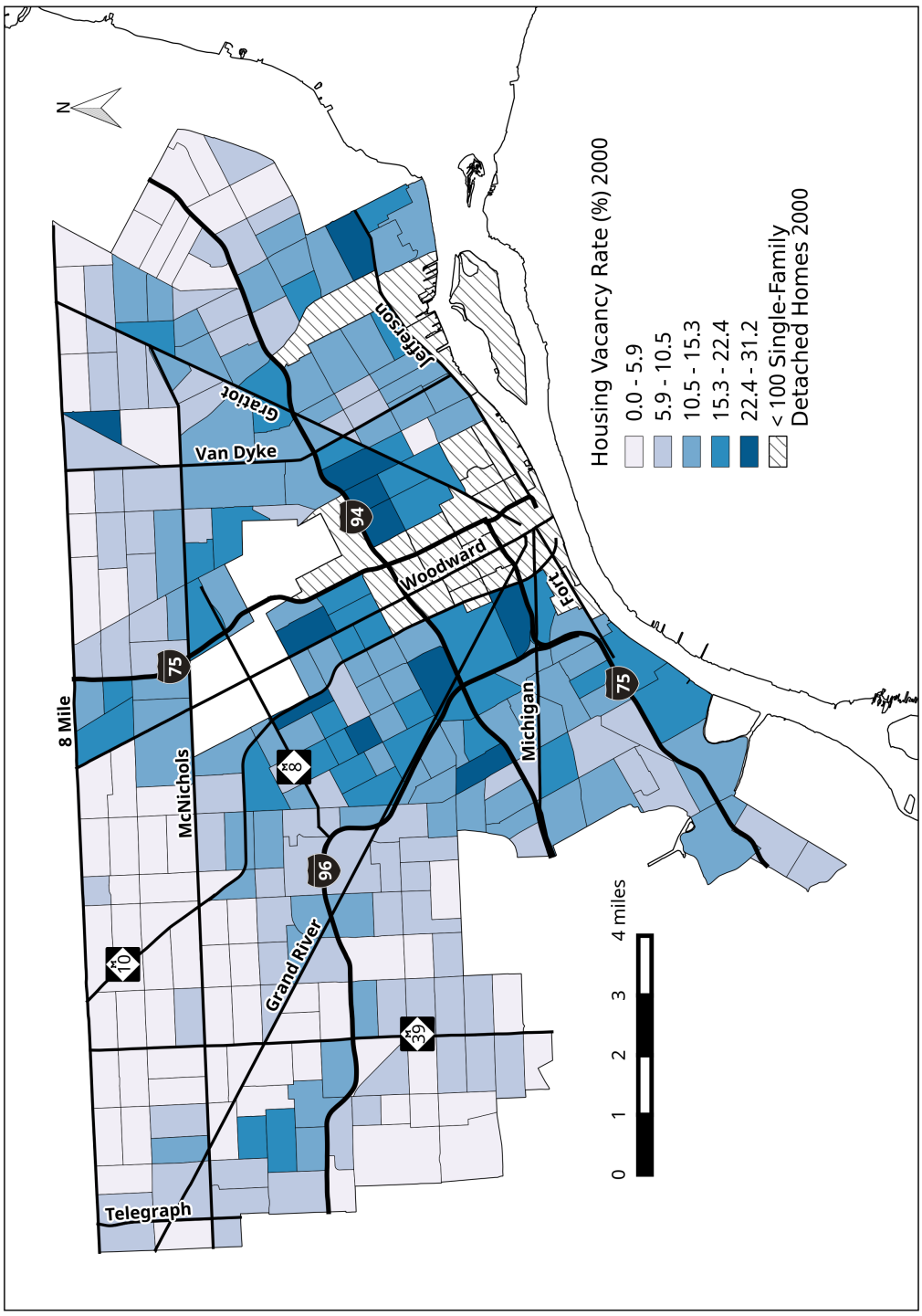

Figure 2.2: Housing Vacancy Rate in Detroit 2000. Source: GeoLytics, Inc., 2003.

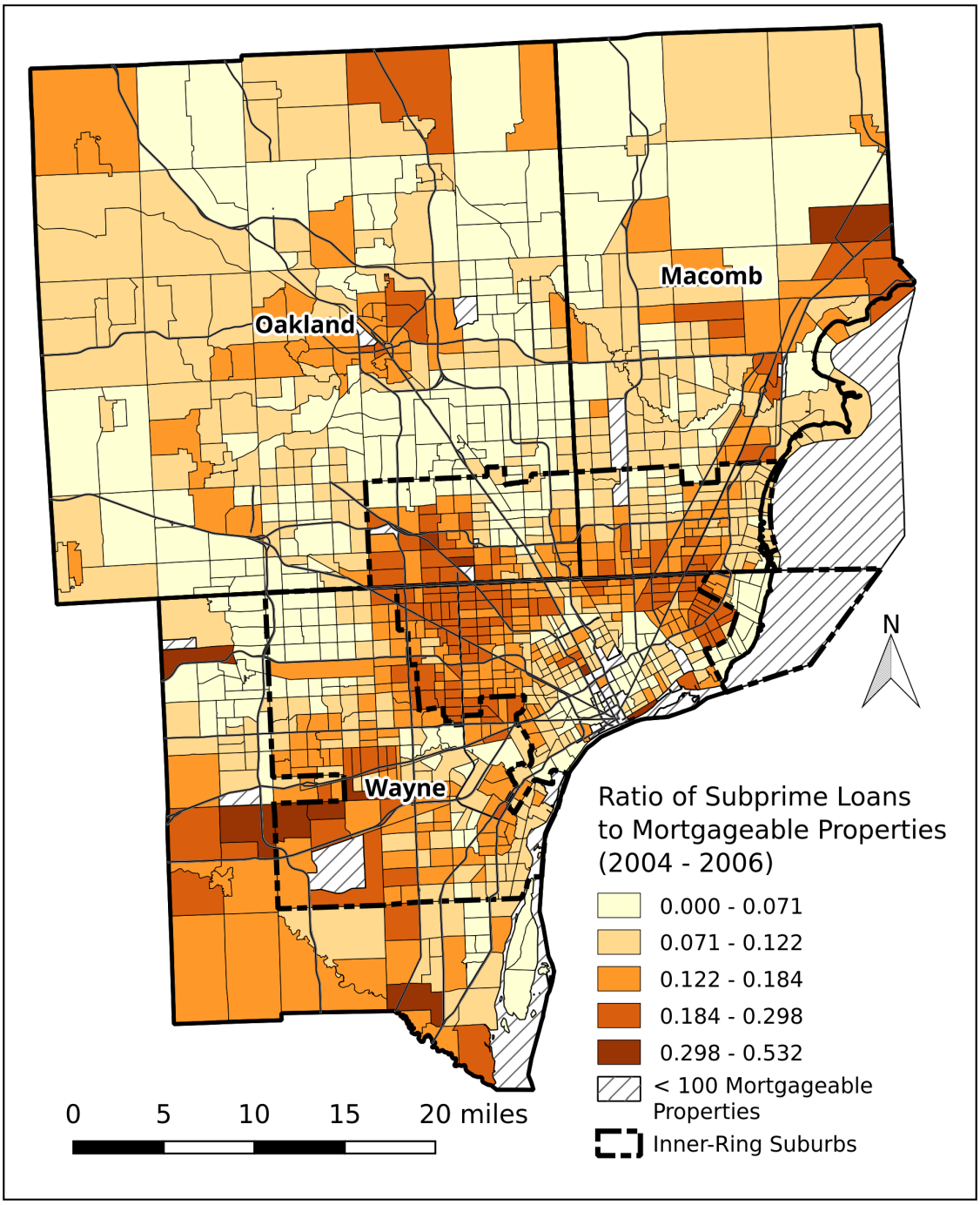

Figure 2.3: Ratio of Subprime Loans 2004–2006 to Mortgagable Properties. Note: "mortgageable properties" is the sum of housing units eligible for home mortgages. See Schuetz, Been, and Ellen (2008) for methodology. Sources: U.S. Board of Governors of the Federal Reserve System, 2004, 2005, 2006; U.S. Bureau of the Census, 2000.

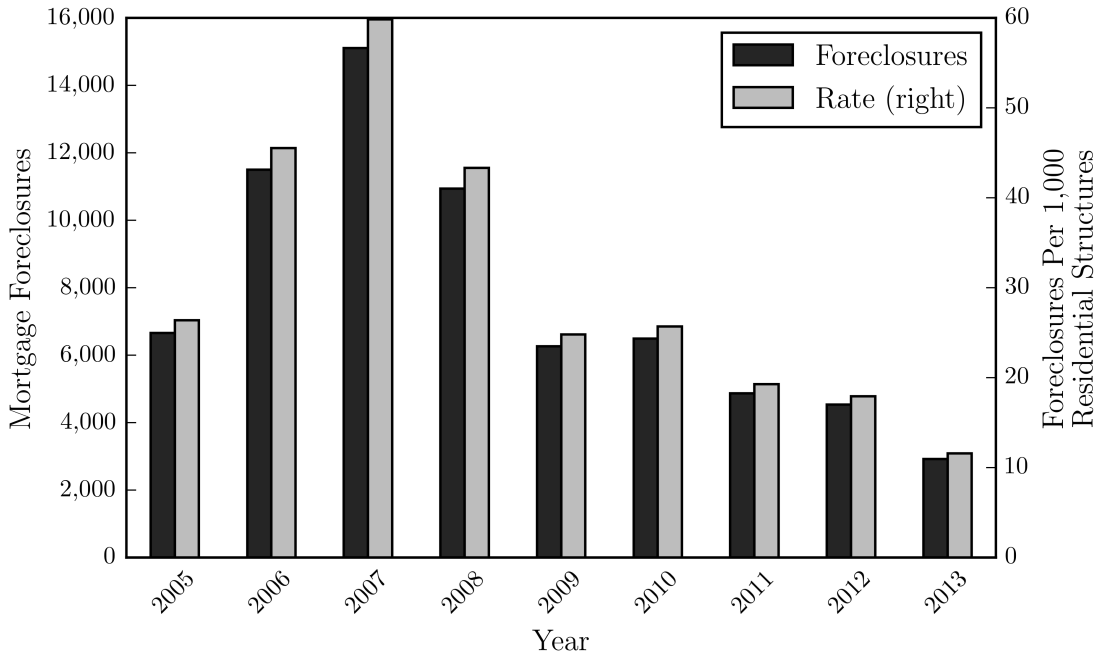

Figure 2.4: Completed Mortgage Foreclosures, Detroit 2005–2013. Sources: CoreLogic (2010), Data Driven Detroit (2010), Wayne County Register of Deeds (2014).

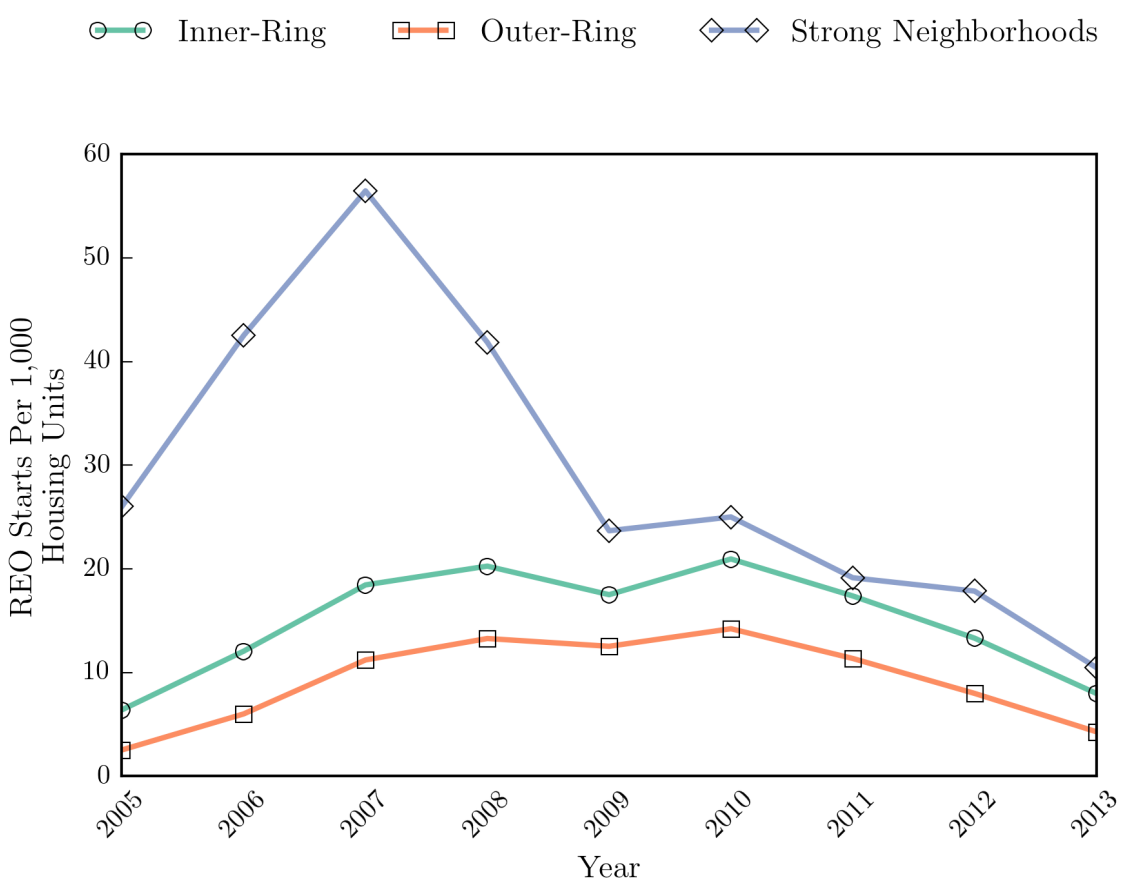

Figure 2.5: REO Starts in Detroit's Strong Neighborhoods and Inner- and Outer-Ring Suburbs, 2005–2013. Sources: RealtyTrac (2015b), U.S. Bureau of the Census (2000).

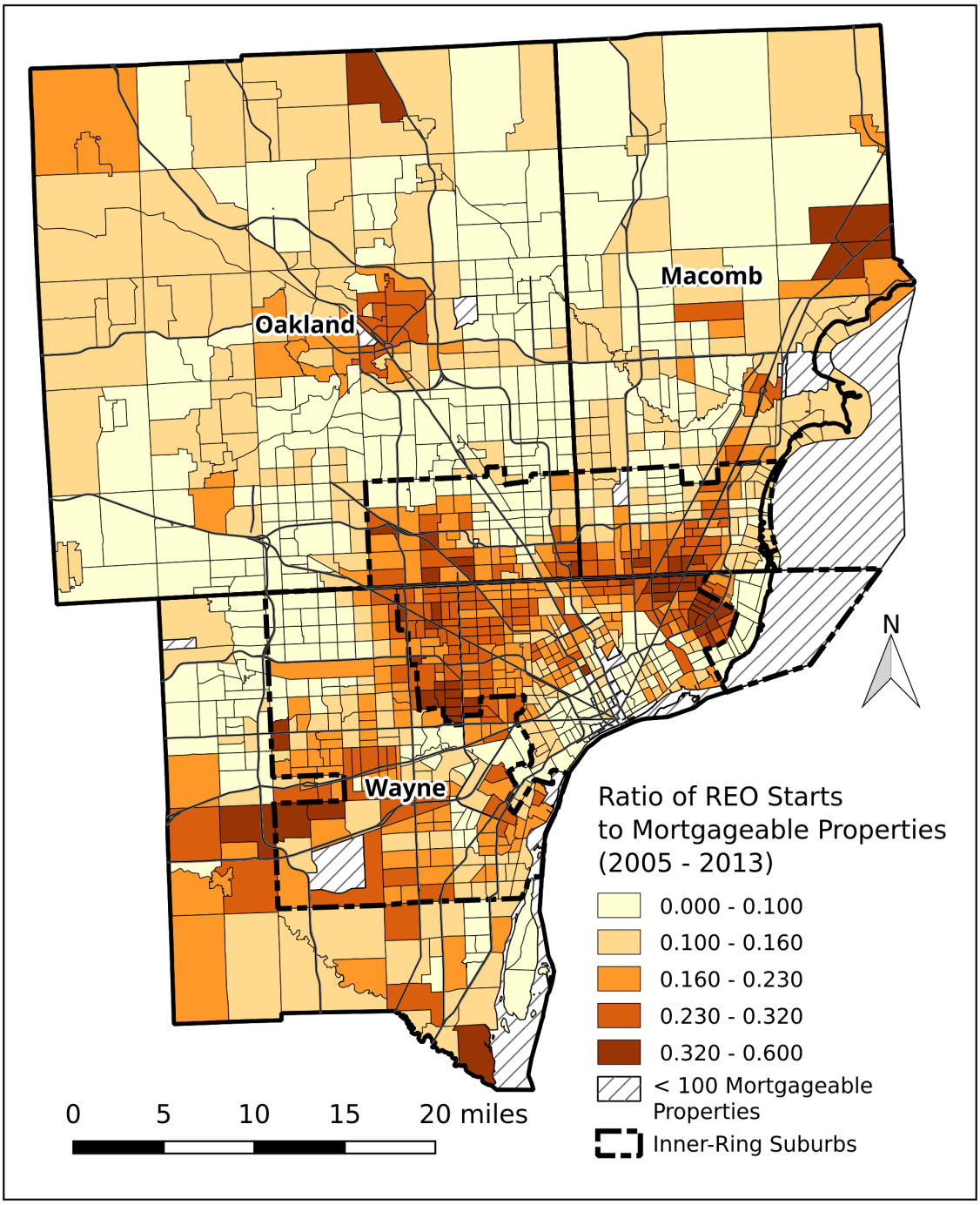

Figure 2.6: Ratio of REO starts 2005–2013 to Mortgagable Properties. Note: "mortgageable properties" is the sum of housing units eligible for home mortgages. See Schuetz, Been, and Ellen (2008) for methodology. Sources: (RealtyTrac, 2015b; U.S. Bureau of the Census, 2000).

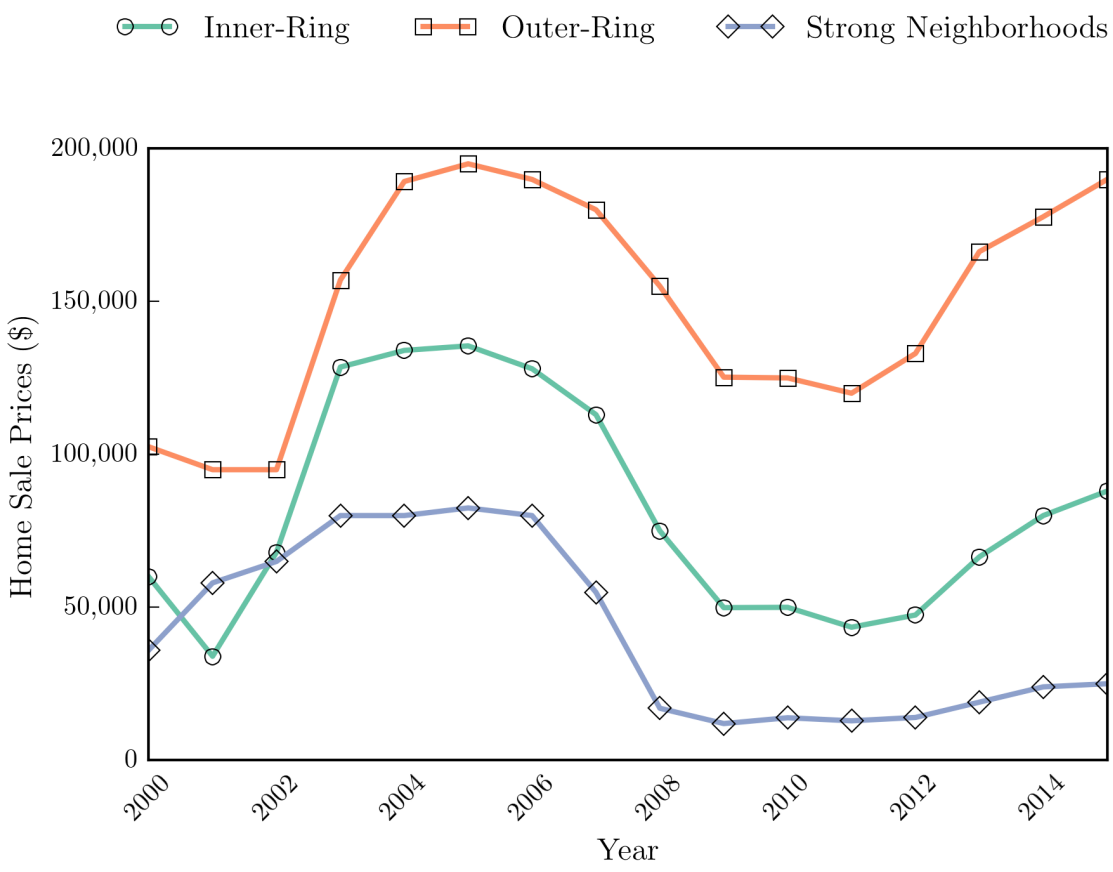

Figure 2.7: Median Home Sale Prices in Detroit Tri-County Area, 2000–2015. Source: (RealtyTrac, 2015b).

Table 2.1: Housing Market Indicators, Subprime Loans, and REO Starts in Detroit Tri-County Area

Indicator	Inner Suburbs	Outer Suburbs	Detroit's Strong Neighborhoods
Median Household Income 1999			
Min	$19,713.00	$23,106.00	$25,051.00
Med	$48,070.00	$65,391.50	$38,810.00
Max	$123,610.00	$170,790.00	$110,745.00
Median Home Value 2000			
Min	$40,000.00	$15,800.00	$43,700.00
Med	$116,800.00	$172,900.00	$74,000.00
Max	$601,800.00	$856,500.00	$311,700.00
Housing Occupancy Rate 2000			
Min	75.53%	79.90%	87.18%
Med	97.39%	96.37%	95.30%
Max	99.70%	99.54%	98.83%
Owner-Occupancy Rate 2000			
Min	1.16%	7.43%	48.92%
Med	82.76%	85.50%	73.11%
Max	99.23%	99.68%	96.70%
Poverty Rate 2000			
Min	0.17%	0.00%	3.36%
Med	5.31%	3.62%	14.75%
Max	40.14%	33.65%	33.29%
Ratio of Subprime Loans 2004–2006 to Housing Units 2000			
Min	0.27%	0.27%	10.47%
Med	9.18%	6.07%	19.20%
Max	29.56%	27.09%	28.74%
Ratio of REO Starts 2005–2013 to Housing Units 2000			
Min	0.58%	0.24%	12.62%
Med	12.66%	8.02%	25.87%
Max	32.77%	43.85%	42.21%

Note: Calculations are for census tracts located within each of the three areas and include only tracts having more than 100 mortgageable properties (Ellen, Madar, & Weselcouch, 2014). Sources: RealtyTrac (2015b), U.S. Board of Governors of the Federal Reserve System (2004, 2005, 2006), U.S. Bureau of the Census (2000).

CHAPTER III

Federal Financial Institutions' Policies and Practices for Handling REOs

In the wake of the U.S. mortgage foreclosure crisis and the ensuing economic recession, private and federal entities together acquired and disposed of millions of REOs nationwide. While national attention has often focused on the impact of the foreclosure crisis on Sunbelt states like California and Florida (Florida, 2011), REOs were also highly concentrated in older industrial cities, particularly in the Midwest. According to one source, the Detroit and Flint metropolitan areas were both included among the top 10 MSAs in terms of the number of REOs relative to housing units in 2008 (Immergluck, 2010b). Comparisons of central city areas alone would likely place more Rustbelt cities into the top rankings of places with high concentrations of REOs. In this chapter I discuss REO owners' policies and practices for handling their inventories. In particular, I focus on federal entities' approaches for managing their REO inventories, both nationally and in distressed market areas.

3.1 How Federal Entities Take Possession of Mortgage Foreclosures

Properties enter REO status at the end of the foreclosure process. Though laws governing mortgage foreclosure differ among states, the process follows a similar progres-

sion that starts with a foreclosure filing and ends with a foreclosure sale. The foreclosure process begins when a mortgage-holder issues a foreclosure notice to a borrower after missing a specified number of payments. After a given number of days pass without payment, a mortgage-holder is likely to file for foreclosure. If a borrower is unable to sell her home or seek other alternatives to foreclosure, the mortgage-holder offers the property at a public auction. The highest auction bidder acquires the property, provided the bid exceeds the reserve price set by the mortgage-holder, usually the unpaid balance on the mortgage plus interest and fees. If a bidder fails to make an offer above the reserve price, the property reverts back to the mortgage-holder. At this point properties are classified as REO. In most cases, properties fail to sell at auction, particularly when and where foreclosure rates are high and property values have fallen, meaning most foreclosures in these markets translate into growing REO inventories (Immergluck, 2010b). When a mortgage is held in a bank's portfolio, that bank acquires title to the foreclosed property and retains sole interest and responsibility. When a loan was pooled and incorporated into a mortgage-backed security, however, beneficial interest belongs to the investors owning shares in the security. The vast majority of subprime loans originated from the late 1990s through the mid-2000s were securitized along with a sizable share of conventional loans. In these cases, banks hold title to foreclosures in name alone, and play the role of either servicer or trustee. Servicers are tasked with collecting payments when mortgages are still performing and maintaining and selling REOs after foreclosure. Servicers pass payments and proceeds on to trustees, who in turn make payments to the owners with beneficial interest (Immergluck, 2011).

Federal institutions differ in the specifics of how they acquire REO inventory. Fannie Mae and Freddie Mac take ownership of foreclosed properties due to their activity on the secondary mortgage market. These two institutions purchase home loans from lenders, bundle many of these loans into mortgage-backed securities, and sell them to investors to generate money for further investment in home loans. The GSEs primarily purchased

conventional, i.e., prime loans, but during the peak years of the housing bubble they began to purchase riskier loans to increase their market share in the face of increasing competition from private securitization firms (Immergluck, 2011; J. Thomas & Von Order, 2010). The GSEs retain the credit risk associated with both the mortgages they hold in their own investment portfolios, as well those sold to MBS paying an additional fee guaranteeing the security of their investment. Working through their mortgage servicers, the GSEs may attempt to resolve delinquencies with means other than foreclosure, but when foreclosure is pursued the GSEs take possession of properties that fail to sell at auction. HUD takes possession of REOs when lenders foreclose on homes purchased with Federal Housing Administration (FHA) insurance. After a lender forecloses on a property purchased with FHA insurance, the lender deeds the property to HUD in exchange for an insurance claim payment. The U.S. Department of Veterans Affairs (VA) repossesses properties purchased with VA-provided insurance, but the VA takes possession at the time of the foreclosure auction like the GSEs (U.S. Government Accountability Office, 2013).

3.2 Federal Systems for Managing and Disposing of REOs

Though they differ in the particulars, institutions responsible for REOs move properties in their inventory through broadly similar disposition processes. Upon entering REO inventory, institutions owning REOs or the servicers acting on their behalf generally try to sell or otherwise dispose of these properties. Some institutions handle these tasks internally, while others contract with third-party asset management companies to handle sales. These asset management companies, in turn, often work with local brokers to sell properties through conventional retail channels. The institutions who own or are otherwise responsible for REOs generally seek to sell their properties for the largest possible return in the shortest possible time. In addition to this objective of maximizing returns, federal entities and some servicers sometimes dispose of properties so as to promote owner-occupancy and neighborhood stabilization, sometimes selling properties as

discounts to homebuyers and nonprofits. In this section, I summarize federal and private entities' systems for managing and disposing of REOs and how they relate to the twin goals of maximizing returns and helping homeowners and neighborhoods.

3.2.1 How HUD Acquires and Sells REO Properties

When a servicer forecloses on a FHA-insured property that is not sold to a third-party, e.g., via short-sale or Sheriff's auction, the property remains the responsibility of the servicer until such time as they possess marketable title, that is, not until the expiration of the redemption period (six months in Michigan) and the eviction of tenants after the expiration of the redemption period, if necessary. Servicers only then may file claims with the FHA, which then inspects the property and verifies inspector compliance before taking title. HUD requires servicers to convey properties in "Acceptable Conveyance Condition," which, in short, means properties must be vacant, secured, winterized, and cleared of debris ("Conveyance of Occupied Property, 24 CFR 203.670," 1996). Properties may be conveyed in damaged condition only where the damage resulted from "mortgagor neglect" and the damage was discovered and documented at the time the servicer took control of the property. Properties damaged while under the control of the servicer require HUD approval prior to conveyance. In general, this approval is granted when the estimate of the cost to repair the damages is equal to or less than $2,500. When damages are not documented during the servicer's initial post-foreclosure inspection and those damages exceed the $2,500 threshold, HUD may re-convey the property to the servicer and require them to make necessary repairs prior to acceptance (U.S. Department of Housing and Urban Development, 2010b). A 2002 audit of HUD's infrastructure for handling foreclosures stated that HUD reported few reconveyances (U.S. Government Accountability Office, 2002), however an interview with a representative of a Cleveland-based community development corporation (CDC) indicated that reconveyances due to unacceptable property

conditions greatly increased in number in the wake of the foreclosure crisis.[1]

Since 1999, HUD has outsourced the maintenance and disposition of REO properties. Prior to 2010, HUD contractors were responsible for both maintenance and disposition activities. Under new contracting procedures adopted in 2010, separate contractors were hired to perform each of these two functions. HUD, through its four regional homeownership centers, hires several entities to perform these functions in areas covering several states. Most germane to the present study, however, are the timelines HUD lays out for selling REO properties. When a HUD-owned property is first placed on the real estate market, priority is given to buyers using the home as a primary residence, government entities, and HUD-approved nonprofits. This period is referred to as the "exclusive listing period," the length of which varies principally based on the condition of the property. If the property is insurable by FHA, which, in short, means the property does not require substantial repairs, the exclusive listing period is 30 days (but now only 15 days as of 2013, see (U.S. Department of Housing and Urban Development, 2013)). For properties uninsurbale by FHA standards, the exclusive listing period is just five days. After the exclusive listing period, unsold properties enter the "extended listing period," during which time investors and buyers of second homes may purchase properties. The duration of the extended listing period is 180 days, after which unsold properties that have an as-is listing value of more than $25,000 continue to be marketed in an open-ended extended listing period (U.S. Department of Housing and Urban Development, 2015b). After 180 days, unsold properties valued at or below $25,000 are offered to local government agencies for $1 as part of the Dollar Homes program. The Dollar Homes program has a window of just 10 days, after which unsold properties also enter an open-ended extended listing period. HUD also has a seven day "lottery" period prior to the other listing periods for insurbale properties in Revitalization Areas (more on this below) and all uninsurable properties.

[1] I approached a number of individuals at HUD and the GSEs, their contractors, and nonprofits in Detroit and Cleveland that have purchased REOs from federal entities. Few were willing to speak with me about the topic of my research, though a few, primarily from the nonprofit sector, were willing to discuss the matter. I have kept their names and organizations confidential.

The lottery period is open only to HUD-approved nonprofits, government entities, or buyers eligible for the Good Neighbor Next Door (GNND) program, which allows teachers, firefighters, emergency medical technicians, and police officers to bid at 50% of the listing price. Starting in late 2009, HUD, along with the GSEs and a small number of large lender/servicers, agreed to participate in the First Look program, which was conceived by and operated National Community Stabilization Trust (NCST). The First Look program, for HUD, adds an additional 10% discount for homes purchased by Neighborhood Stabilization Program (NSP) participants.

HUD also has geographically targeted sales programs known as Revitalization Area sales programs. Revitalization Areas are defined at the census block group level, and they "must be in neighborhoods with very low income, low homeownership or a disproportionately high concentration of delinquent or foreclosed properties" (U.S. Department of Housing and Urban Development, 2011). Additionally, revitalization areas must be those where the average sales price of HUD-owned REOs is less than or equal to $200,000. A large number of census block groups in Detroit, as in Cleveland, Chicago, and other hard-hit municipalities are included among HUD's Revitalization Areas. Revitalization Area sale programs include not only the GNND, but also the Asset Control Area (ACA) program, launched in 1998, which allows state, county, and local governments, as well as eligible nonprofits to enter into a two-year agreement with HUD making all HUD-owned REOs exclusively available to local ACA participants. Homes with an appraised value of $25,000 or less may be purchased for $100 and all other properties are discounted by a minimum of 50% off the appraised value for the purpose of resale to income eligible households. The ACA program was used in the late 1990s and early 2000s in Chicago, Cleveland, Los Angeles and other cities. Since the early 2000s, the ACA program has only been used a few times, a fact attributed to the lenders' tightening credit standards and HUD's rigid pricing structure for the price at which properties must be sold to homebuyers (**almada_nonprofits_2001**; Seidman, Jakabovics, et al., 2009).

In summary, HUD has a number of programs and incentives for selling foreclosed FHA-insured properties to owner-occupants, nonprofits, and local governments. These programs are intended to further HUD's mission to expand homeownership opportunities, particularly for low-income households, and preserve neighborhoods by keeping properties out of the hands of speculators. Prior audits of HUD's disposition processes, however, have identified several obstacles to maximizing the number of foreclosed properties sold to owner-occupants. One of the most critical obstacles identified in these audits is the condition in which HUD sells its properties. HUD typically makes just the minimum number of repairs required to meet basic health and safety standards. This reduces the number of FHA-insurable properties, making it difficult, if not impossible, for prospective homeowners to obtain financing for them. Properties in need of extensive repairs are therefore most likely to be acquired by investors via cash sales, potentially remaining unsold for long stretches of time (U.S. Government Accountability Office, 2013).

3.2.2 How the GSEs Acquire and Sell REO Properties

Unlike HUD, the GSEs take title of properties that go unsold at foreclosure auctions within 24 hours (U.S. Government Accountability Office, 2013). The GSEs manage and sell REO properties through a combination of internal channels and contractor networks. Prior to listing properties, the GSEs repair a substantially larger share of properties than HUD, at least when viewed at the level of holdings nationwide. According to one audit, the GSEs repair between 23 and 29% of the REOs they sell, as compared to just 5% for HUD. To support their goals of expanding homeownership, the GSEs offer several programs intended to help homeowners purchase GSE-owned properties, though they are fewer in number than those offered by HUD. Like HUD, the GSEs have participated in the national First Look period since late 2009 (News, 2009). First Look provides an exclusive listing period of 15 days for owner-occupants, local governments, and NSP grantees. The GSEs also offer flexible financing for REO buyers. Fannie Mae's HomePath program allows buyers

to put down as little as 3% and does not require mortgage insurance. Additionally, Fannie Mae offers loan products that include the cost of repairs. Freddie Mac has a financing program which allows borrowers to put up to 3.5% of the purchase price toward closing costs and other expenses. Unlike HUD, both GSEs have explicit bulks sale programs for simultaneously disposing of large numbers of REOs to investors at substantial discounts (Fannie Mae, 2016). Like HUD, however, the GSEs sell properties in as-is condition, which can create difficulties in finding financing in addition to creating a disincentive for less risk-averse homebuyers. In limited cases, Fannie Mae has also worked with local land banks to dispose of distressed, low-value properties. Fannie Mae has worked intermittently with the Cuyahoga County Land Reutilization Authority (CCLRC) since 2009, selling homes to the land bank for as little as $1 and contributing $3,500 toward demolition (Fujii, 2015; Livingston, 2009). Fannie Mae offered to sell some of its properties to Detroit at a discount during the Bing Administration (2009–2013), but city officials turned down the offer because the $3,500 per property offered by Fannie Mae was too low to cover the costs of demolition (MacDonald & Kurth, 2015). In 2015, however, Fannie Mae entered into an agreement with the Detroit Land Bank Authority (DLBA) for the discounted sale of 44 homes (Gallagher, 2014).

3.2.3 How Lenders Sell REO Properties

While lenders and servicers are not charged with the same public purpose objectives assigned to HUD and the GSEs, several national private entities participate in the First Look program, including Bank of America, Chase, Citi, Deutsche Bank, GMAC, Nationstar Mortgage, Ocwen Financial Corporation, Saxon Mortgage Services, U.S. Bank, and Wells Fargo. According to press releases for the program, the combined federal and private participation represented roughly 75% of the national REO marketplace in 2010 (U.S. Department of Housing and Urban Development, 2010a). A small number of lenders and servicers have additional programs for donating or discounting REOs to nonprof-

its, though these programs were not launched until well after 2010. For instance, Wells Fargo, one of the nation's largest servicers and perhaps the most visibly active among servicers in participating in community development initiatives, launched its Community & Neighborhood Stabilization Program sometime around 2014 (Franks, 2016).

Many private entities, like the GSEs, have also offered investors the option of bulk purchases, though they differ in the particulars of how these transactions are executed. According to one mortgage servicing trade publication,

> Banks have different philosophies for dealing with bulk REO…Some sellers only want to do end-of-the-year cleanouts and take writedowns. Others operate by doing big bulk sales at the end of every quarter. It changes from bank to bank. Some have even chosen not to do it anymore have have discontinued bulk sales [*sic*] ("Bulk REO Properties Sold through Bidding Transactions," 2009).

Despite these differences among lenders and servicers in the particulars of how they dispose of properties, the logic driving their actions suggests bulk sales and other so-called "alternative disposition strategies" were likely widespread in Detroit, including auctions, particularly during the peak of the foreclosure crisis. For example, in 2007, several large lenders hired Texas-based auctioneers to sell a pool of 450 properties properties, accepting bids started at just $1 (Dymi, 2007).

3.3 The Growth of Federal REO Inventories

The growth of private and federal REO inventories, both nationally and in specific housing markets, created substantial pressure for REO owners to dispose of inventory. According to RealtyTrac, the number of foreclosure filings nationally rose from roughly 700,000 in 2006 to more 2.8 million in 2010, an increase of 300% (RealtyTrac, 2015a). Between 2006 and 2010 alone, more than 10 million foreclosure filings had been recorded.

Although not every foreclosure filing led to a property being foreclosed or repossessed by a private or federal entity, the number of properties entering REO was doubtless substantial. In the early years of the foreclosure crisis, most foreclosures were linked to subprime loans held by investors in private-label residential MBS, i.e., those that were *not* secured by the GSEs. For that reason, REO inventories swelled for private REO owners between 2006 and 2008. While the number of properties entering private REO inventories at a given point in time are not publicly available, sources estimate the standing REO inventory linked to loans backing these private-label RMBS peaked in 2008 at more than 400,000 (McBride, 2010b, 2012). The numbers for properties entering and leaving each year were much higher. As privately held REO inventories fell from their 2008 peak values, federal inventories began to grow. As Figure 3.1 shows, the number of properties entering federal inventories soared between 2008 and 2010. While REO starts for federal entities declined between 2010 and 2014, they remained elevated relative to the pre-crisis period. Between 2008 and 2014, the GSEs and HUD acquired a combined 1,733,944 properties nationwide. Fannie Mae handled the largest number of REOs of the federal entities by far, taking in exactly 50% of the 1.73 million federal REOs acquired during this period. Freddie Mac and HUD roughly split the other half of these federal REO starts (Fannie Mae, 2003, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013a, 2014, 2015; Freddie Mac, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015; U.S. Department of Housing and Urban Development. Federal Housing Administration. Office of Risk Analysis and Regulatory Affairs, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014).

3.4 Pressures on the GSEs and HUD to Dispose of REOs

The two central GSEs involved in housing finance, Fannie Mae and Freddie Mac, were created by the federal government for the purpose of increasing liquidity and stability in the U.S. residential mortgage market and, and a result, promoting borrowers' access to affordable mortgage credit. Fannie Mae was first chartered as a private company by

the Roosevelt administration in 1938 for the purpose of purchasing FHA-insured mortgages (FHA insurance was introduced four years before), which provided more money for lenders to make additional such loans. In 1968, the government assigned Fannie Mae the status of a GSE, i.e., a private corporation subject to federal oversight and regulation, and altered Fannie Mae's charter to allow it to purchase mortgages other than those insured by the FHA or VA. This status signaled to investors that Fannie Mae (as well as other GSEs, including Freddie Mac) had the full backing of the federal government. In 1970, the federal government established the Federal Home Loan Mortgage Corporation, now known as Freddie Mac. Freddie Mac was first chartered for the purpose of purchasing conventional loans issued by thrifts (as opposed to commercial banks), but was assigned GSE status in 1989.

Fannie Mae played a supporting role in housing finance for the first few decades of its existence, but, after a number of regulatory changes and innovations in housing finance occurring in the 1980s and 1990s, it, along with Freddie Mac, came to play a dominant role in the mortgage market. The growing role of these institutions is due not only to their privileged status, but also to growth of their issuance of MBS, created by bundling large numbers of individual loans (Carliner, 1998; Immergluck, 2011; Schwartz, 2014). Leadership of these entities in the 1990s and 2000s, particularly at Fannie Mae, also encouraged taking advantage of the GSEs' privileged status to aggressively grow their portfolios, greatly increasing their leverage as a result (Acharya, Richardson, Van Nieuwerburgh, & White, 2011; Morgenson & Rosner, 2011). By 2000, the GSEs controlled fully 40% of home mortgage debt (Frame, Fuster, Tracy, & Vickery, 2015). In the face of increased competition from companies issuing private-label MBS in the late 1990s and early 2000s, the GSEs acquired riskier loans to maintain market share (Frame et al., 2015; J. Thomas & Von Order, 2010). As the housing crisis intensified between 2006 and 2008, the two GSEs became increasingly financially distressed due to their high exposure and leverage.

In order to prevent the curtailment of the GSEs' activity in the mortgage market and a

spike in mortgage rates as a result, the federal government nationalized Fannie Mae and Freddie Mac in 2008 and committed up to $200 billion for investments in each company. In total, the government ended up investing $189 billion in the two GSEs, with $117 billion invested in Fannie Mae and $72 billion invested in Freddie Mac (Frame et al., 2015; Federal Housing Finance Agency, n.d.). The GSEs were perceived at the time of their nationalization to be no longer capable of raising debt—and, therefore, no longer able to purchase loans on the secondary mortgage market—without the intervention of the federal government. Under the terms of the bailout plan for the GSEs, Fannie Mae and Freddie Mac were both placed under the conservatorship of the Federal Housing Finance Agency (FHFA), which was vested with the powers of the management, boards, and shareholders of the GSEs (Federal Housing Finance Agency, 2011). The central objective of the conservatorships was to return the GSEs to financial health. In 2009, one year after the start of the conservatorships, FHFA Director Lockhart (2009) remarked, "FHFA's duties as conservator mean just that, conserving the Enterprises' assets. This is our top goal." In the first years of the conservatorships, the FHFA had the GSEs tighten underwriting in order to limit taxpayers' risk exposure on new loans. The FHFA also took steps to minimize losses from mortgages already on their books, including the use of mortgage modifications and other foreclosure alternatives (Federal Housing Finance Agency, 2011).

The FHFA's narrow focus on financial soundness, however, has come into conflict with broader housing policy objectives. A frequently cited example of this conflict is the FHFA's long-standing refusal to offer principal reduction to troubled borrowers with negative equity, i.e., those owing more on their mortgage than the market value of their homes (Frame et al., 2015; Weise, 2010). Borrowers with negative equity have a high probability of defaulting, leading to additional foreclosures and default losses, as well as negative spillovers in neighborhoods with concentrated foreclosures (Foote, Gerardi, & Willen, 2008; Frame, 2010). Based on the soundness of arguments that principal reductions would be more effective than modifications involving only reduced interest rates (Haughwout, Okah, &

Tracy, 2016), the Treasury expanded the Home Affordable Modification Program (HAMP) program (launched in 2008) in 2010 to offer principal reductions. Although several large banks began making principal reductions after the launch of the new program, the FHFA decided against participating due to its concern for moral hazard (Zandl, 2012). Specifically, the FHFA feared borrowers would strategically default in order to trigger principal reductions, thereby avoiding full payment of their mortgages. Some critics have framed the FHFA's decision as stemming from a conflict between the agency's short- and long-term objectives. While prohibiting principal reduction prevented the FHFA from realizing short-term losses on their balance sheets, this action runs counter to the agency's objective of bringing stability to the national housing market (Weise, 2010). By the fourth quarter of 2009, more than 11 million borrowers had negative equity, equivalent to roughly one-quarter of existing borrowers, with the GSEs together owning more of those loans than either investors or banks (McBride, 2010a). This represents a major missed opportunity for the federal government, through the GSEs, to have helped troubled borrowers and neighborhoods. While the FHFA has recently reversed its position and begun to offer principal reductions, the window of opportunity for the FHFA to have helped distressed borrowers has passed (Goodman, Parrott, & Zhu, 2015).

The FHFA's focus on short-term enterprise-level financial improvements has also influenced their stewardship of the GSEs in the area of REO management and disposition. REO properties are a clear credit risk to these entities due to the high operational costs associated with these properties. Table 3.1 shows the annual operating expenses for the single-family REO inventory, which ballooned along with the number of new REOs between 2007 and 2010. Between those two years, operating expenses, which include the costs of maintenance and repairs, increased 290% from $649 million to more than $2.5 billion. Between 2007 and 2011, the GSEs spent more than $8.5 billion handling single-family REOs. The FHFA and the GSEs also faced the threat posed by the "shadow inventory" of seriously delinquent mortgages (more than 90 days delinquent), which was vastly larger

than annual REO inventories in the late 2000s and early 2010s. As shown in Table 3.2, the ratio of the fourth-quarter inventory of seriously delinquent single-family mortgages to REO properties was more than 6 to 1 in 2011 and 2012. The GSEs, at the encouragement of the FHFA, were directed to dispose of REOs as rapidly as possible, while also making as much money on them as possible, to reduce risk to their balance sheets and the taxpayers, who remained on the hook for losses posted by the GSEs. While the GSEs relied on retail means to sell most of their REO inventory, i.e., individual sales of properties using conventional marketing methods, they turned to bulk sales for properties located in markets with concentrated foreclosures and hard-to-sell properties (Fannie Mae, 2016; Goldstein & Stevenson, 2016a). The geographic specificity and overall low number of these bulk transactions relative to overall size of the GSEs' REO inventory, however, kept the focus off bulk sales until the FHFA and HUD jointly examined the feasibility of a national REO-to-rental program, wherein large institutional investors would buy REOs in bulk in order to manage them as rental properties for a certain number of years (U.S. Congress, 2012). HUD, due to the depletion of its mortgages insurance fund during the mortgage foreclosure crisis, was also under internal and external pressures to sell REOs rapidly while maximizing overall returns (U.S. Congress, 2013c). In 2012, the FHFA piloted a national REO-to-rental program by selling pools of properties in eight geographic areas where REO concentrations were particularly high, including Atlanta, Chicago, parts of Florida, Los Vegas, and Phoenix (Federal Housing Finance Agency. Office of Inspector General, 2013). As the housing market began to recover nationally during and after 2012, neither the FHFA nor HUD decided to pursue the pilot further. Currently, the FHFA and HUD have begun to engage in the bulk sale of seriously delinquent mortgages to investors prior to foreclosure to avoid REO-related operating costs in their entirety (Perlberg, Gittelsohn, & Benson, 2015).

What is missing from the public record, however, is the number of bulk sales that occurred not as part of a national bulk sale pilot program, but rather as a release valve for

possibly low-value properties in markets with large concentrations of REOs like Detroit. Media accounts from Detroit and other cities report discounted sales to investors, many of whom were bulk buyers (e.g., Dixon, 2011; Goldstein & Stevenson, 2016a). While these local accounts focus on the damaging effects such sales can have on neighborhoods, the FHFA views these sales as anomalous and almost not worth mention. In discussing the parameters of the national REO-to-rental pilot program, Meg Burns, a Senior Associate Director at the FHFA, told Congress only that "there are some small bulk sales of lower valued properties that take place" (U.S. Congress, 2013a, p.9). Former FHFA Director Edward DeMarco similarly downplayed bulk sales in distressed housing markets when questioned by Congress about their extent and impact, remarking,

> you have got anecdotes that are kind of driving sort of a sense of a larger picture thing, and the anecdotes can be very well true and there could be a good number of them, but when we are dealing with hundreds of thousands of REO, they remain anecdotes (U.S. Congress, 2013b, p.20).

It is the purpose of this dissertation to determine precisely how many sales of federally owned properties were made to investors, particularly large investors, and to what effect, providing a systematic evaluation of such sales to improve the impression provided by anecdote.

Table 3.1: GSE Single-Family REO Operating Expenses (in Millions), 2007–2011

Creditor	2007	2008	2009	2010	2011	Total
Fannie Mae	$444	$1,888	$857	$1,680	$765	$5,950
Freddie Mac	$205	$1,097	$287	$676	$596	$2,861
Total	$649	$2,941	$1,144	$2,536	$1,361	$8,541

Note: Expenses calculated based on maintenance, repair and other costs; valuation allowances; disposition gains or losses; and recoveries from insurance or bank repurchases. Calculations made by Federal Housing Finance Agency. Office of Inspector General (2012). Sources: Fannie Mae (2009, 2011), Federal Housing Finance Agency. Office of Inspector General (2012), Freddie Mac (2009, 2011).

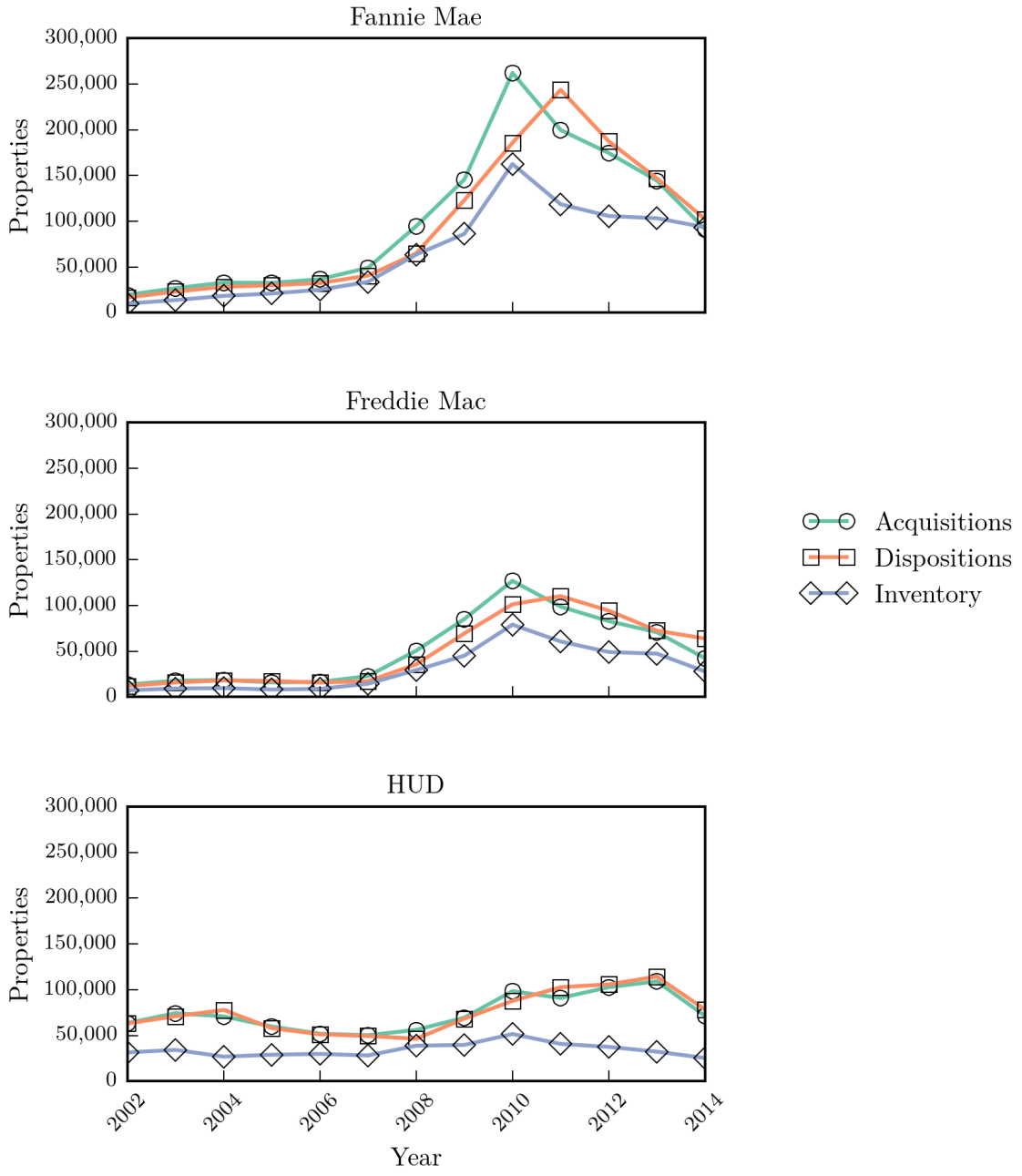

Figure 3.1: Annual REO Starts, Dispositions, and Inventory for the GSEs and HUD, 2002–2014. Sources: Fannie Mae (2003, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013a, 2014, 2015), Freddie Mac (2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015), U.S. Department of Housing and Urban Development. Federal Housing Administration. Office of Risk Analysis and Regulatory Affairs (2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014)

Table 3.2: Single-Family REO Inventories and Mortgages Over 90 Days Delinquent, 2011–2012

Creditor	2011	2012	2013
Fannie Mae			
Seriously Delinquent [a]	690,911	576,591	418,837
REO Inventory [b]	118,528	105,666	103,229
Ratio	5.83	5.46	4.06
Freddie Mac			
Seriously Delinquent [a]	412,988	352,860	253,325
REO Inventory [b]	60,555	49,077	47,308
Ratio	6.82	7.19	5.35
GSEs			
Seriously Delinquent [a]	1,103,899	929,451	672,162
REO Inventory [b]	179,083	154,743	150,537
Ratio	6.16	6.01	4.47
HUD			
Seriously Delinquent [a]	635,096	738,991	627,958
REO Inventory [b]	37,445	32,226	25,306
Ratio	16.96	22.93	24.81

[a] Sources: Federal Housing Finance Agency (2012, 2013, 2014b), U.S. Department of Housing and Urban Development. Federal Housing Administration. Office of Risk Analysis and Regulatory Affairs (2012, 2013, 2014).

[b] Sources: Fannie Mae (2012, 2013a, 2014), Freddie Mac (2012, 2013, 2014), U.S. Department of Housing and Urban Development. Federal Housing Administration. Office of Risk Analysis and Regulatory Affairs (2012, 2013, 2014).

CHAPTER IV

Creating REO Pathways Databases

This dissertation employs two separate, but related databases of REO pathways, each constructed using distinct data sources. The first, which I will refer to as the Detroit database, was constructed from two data sources limited to records of real-estate transactions in the City of Detroit. The second, which I will refer to as the Regional database, was constructed entirely from real-estate transaction records obtained from RealtyTrac for the nine-county Detroit metropolitan area. These sources and the construction of these two databases is detailed in the following sections.

4.1 Data Sources

To create the Detroit database of REO pathways, I first identified which Detroit residential properties went through the entire mortgage foreclosure process between January 1, 2005 and December 31, 2013. For each of these properties I collected information related to mortgage foreclosure auctions, including buyer name and sale amount; information related to the next sale occurring after the foreclosure auction, if one occurred during the study period; whether and at what time in their post-mortgage-foreclosure history properties were repossessed due to delinquent property taxes; and whether and at what time properties received a notification of blight by the City of Detroit.

To create the Detroit database, I combined property records from several sources (see

Table 4.1). The vast majority of these data come from two sources: Detroit real-estate transaction records from January 1, 2005 to December 31, 2010 provided by Social Compact, who in turn acquired these data from CoreLogic; and Detroit real-estate transaction records from January 1, 2008 to December 31, 2013 provided by Data Driven Detroit, who in turn purchased them from the Wayne County Register of Deeds (WCROD). Records from these two sources contain data fields essential for determining what happened to properties subsequent to mortgage foreclosure and the parties responsible for them, including record date, record type, buyer, seller, price, and property address. Because the Data Driven Detroit data are more consistent in reporting the deed type as recorded in the local land records, I use these data for the period they overlap with the Social Compact data, specifically, 2008 through 2010. Additionally, I obtained real-estate transaction records for the City of Detroit from January 1, 2003 to September 12, 2014 through a data grant from CoreLogic. These records exclude complete buyer and seller information and contain only binary indicators, e.g., investor purchase, not the names of buyers and sellers, so these data were used primarily for diagnostic purposes in constructing the Detroit database.[1] In particular, I used these data to find foreclosure and sales records absent from the Social Compact data between 2005 and 2007. I also obtained data directly from the WCROD, which granted me research access to their on-line database of land records. From this database I obtained mortgage foreclosure redemption receipts absent from the other data sources, as well as buyer and seller information for the CoreLogic records absent from the Social Compact data. To collect tax foreclosure data, I used records of completed tax foreclosures from 2008 to 2013 WCROD records provided by Data Driven Detroit. For 2014 and 2015, I used records of properties auctioned by the Wayne County Treasurer for delinquent property taxes in 2014 and 2015 listed on Loveland Technologies' website. Property characteristics, including lot size, square footage, and assessed value, were obtained from the City of Detroit Assessor's Office. Finally, blight notification data

[1]These data, however, are central to the construction my home sales dataset, employed in the hedonic regression discussed below.

were retrieved from the City of Detroit's online open data portal.

To create the regional database of REO pathways, I made use of a RealtyTrac data obtained by Institute for Social Research (ISR) for the nine-county Detroit metropolitan area. These counties include Wayne, Oakland, Macomb, Genesee, Livingston, Lapeer, St. Clair, Washtenaw, and Monroe Counties. The periods covered for each county differ: data for the tri-county area of Wayne, Macomb, and Oakland are present from 2004 to 2015. These data contain records for each of the other counties from 2005 to 2015, with the exception of Lapeer, for which records are present from 2006 to 2015. In addition to providing real-estate transaction records, RealtyTrac provides assessor's data containing fields needed to control for property characteristics in statistical analysis.

4.2 Detroit Database Construction

My process for creating the Detroit REO pathways database began by generating a list of properties for which my data indicate a completed foreclosure took place, i.e., those for which a Sheriff's Deed was recorded between 2005 and 2013. For each record of a completed mortgage foreclosure, I queried among my data for all records occurring on or after the date of the Sheriff's Deed in question through the date of any subsequent mortgage foreclosures or the last transaction recorded for a given property, whichever occurs first. Using the results of these queries, I applied a number of algorithms to locate or derive information needed to populate the foreclosure pathways database. The following sections explain these procedures in detail.

4.2.0.1 Identifying Records Related to a Common Street Address

Identifying all records related to a specific street address is a deceptively simple task. Addresses are subject to error and variation, for example, street suffixes, e.g., lane, road, street, are not always present and they may or may not be abbreviated. Parcel numbers, which exist largely for property tax collection purposes, are far easier to use to identify

records associated with a given property. Parcel numbers offer a more consistent field for identifying individual properties. A liability of using parcel numbers, however, is that they are not necessarily coterminous with the entirety of lands subsumed under a common street address. Common street addresses may be linked to two or more parcel numbers. This is often due to the simultaneous acquisition of a residential parcel with a structure and an adjacent vacant lot. Such agglomerations are only gradually reflected in parcel numbers. As a result, records representing REO sales may be recorded using a different parcel number than that for which the Sheriff's Deed was recorded. In other cases, the party responsible for transcribing the physical document may have failed to accurately transcribe the parcel number(s). In a small number of cases, parcel numbers are not recorded at all. To balance the advantages and disadvantages of these two approaches for identifying records associated with a given property, I identified records related to a given property using both address and parcel number.

4.2.0.2 Identifying Residential Mortgage Foreclosures and REO Owners

To identify owners of REO properties, I first identified all properties that went through the entire mortgage foreclosure process from 2005 to 2013. For Detroit, as for Michigan, this involves collecting Sheriff's Deed records. Data obtained from Social Compact, however, do not contain detailed document type information for mortgage foreclosures; records are simply labeled as a "foreclosure" in these data. To ensure records labeled as "foreclosures" in the Social Compact data do not erroneously include records related to tax foreclosure, I checked Social Compact foreclosure records against records obtained from the CoreLogic data grant, which include the deed type listed in the local land records. Records obtained from Wayne County include the full document type description, which allowed me to query for Sheriff's Deed records alone. In a number of cases, properties have two Sheriff's Deeds recorded in quick succession, which is due to one of several scenarios. The most common cases are those where both the senior and junior lien holder

record Sheriff's Deeds (which is not proper—the junior lien holder recoups the difference between the auction amount and the senior lien holder's balance, which is usually nothing), or the servicer holds an initial, but illegitimate, foreclosure auction. To account for these duplicate, from the perspective of the present study, foreclosure records, I removed from consideration any Sheriff's Deed occurring 365 or fewer days prior another Sheriff's Deed record. Additionally, I removed from consideration any Sheriff's Deed record for which I was unable to identify an REO sale, but for which a Sheriff's Deed was recorded at a later date. To account for the possibility a property was redeemed after foreclosure, I collected Redemption Receipts from the WCROD and dropped all records of mortgage foreclosures preceding a record of redemption. Previous studies have included deed in lieu of foreclosure transactions when identifying REO properties. The additional complexity of this task in the face of gaps and errors in the source data, however, was prohibitive. The large number of properties moving through the entire foreclosure process is suitable for present purposes.

After identifying Sheriff's Deed records, I applied several rules to identify parties taking possession of properties. In some instances, third-party purchasers acquire properties at the foreclosure auction, but this is rare in Detroit. In nearly all cases, foreclosed properties enter REO status. Previous studies of REO pathways apply key-word searches to the grantee names to distinguish between third-party buyers and institutions repossessing properties, i.e., lenders transferring properties into REO. This procedure is inadequate for my purposes for two reasons: first, records of properties entering REO inventories of federal entities often occur after a Sheriff's Deed is recorded. For HUD, this is nearly always the case. Second, MERS frequently appears as the grantee in Sheriff's Deed records. Among records in the final dataset, roughly 9,000 out of nearly 70,000 name MERS as grantee in the Sheriff's Deed. As a result, it was necessary to look at subsequent records to determine whether a property was repossessed by a bank or federal entity. To identify properties entering federal REO inventories, I first looked at the grantee name recorded

in the Sheriff's Deed. If this name did not match a federal entity, I checked the grantee field in all subsequent transactions prior to subsequent mortgage or tax foreclosures. Finally, if neither of these procedures found a match, I searched grantor fields for federal entity names. There are several instances in which federal entities' names appear for the first time in a given property's history as the grantor in a REO sale. In some instances, federal entities required lenders to take back defectively underwritten loans after foreclosure. In cases where there was an initial transfer to a federal entity followed by a return transfer from the same federal entity to a lender, these properties were coded as privately held REOs (n=862). In instances where MERS is named as the grantee in the Sheriff's Deed—which indicates sale to a lender, not a third-party purchaser—I examined grantee and grantor names in subsequent records for lender names in a manner similar to that described for identifying federal entities. To accomplish these name-matching tasks, I used regular expressions, which are special text strings that can be used for fuzzy string matching.

Identifying individual private entities responsible for mortgage-reverted properties is far more difficult than identifying properties for which the GSEs and HUD are responsible. Sheriff's Deeds documenting a property's entrance into private REO inventories may include the name of the mortgage pool, the trustee of the mortgage pool, the servicer contracted by the trustee, an attorney, MERS, or any combination of these names in the grantee field (lenders and servicers may be different departments or subsidiaries of the same institution). Seller names listed on records of REO sales exhibit the same variation and complexity. Further, the large number of acquisitions and mergers occurring during this period make it difficult to assign responsibility to a single party. As a result, it is impossible to state the exact number of properties sold by any one particular mortgagee or servicer during the study period. It is possible, however, to present the results of fuzzy string matching to present a rough estimate of how many properties the largest servicers handled during this period. These data are presented below.

To restrict data to records of mortgage-foreclosed residential properties, I used the City of Detroit Assessor's Office records to obtain a given property's class code, which indicates each property's use type, e.g., commercial, industrial, and residential. I obtained the property class code from the assessor file released in the year closest to the year a given mortgage foreclosure was recorded.

4.2.0.3 Identifying REO Sales

For each property entering REO, I identified REO sales using records occurring after the mortgage foreclosure auction in question—but prior to any subsequent foreclosure, should one occur—using a number of rules. In a first pass across records following a mortgage foreclosure auction, I flag the earliest record that is neither a mortgage foreclosure nor a tax foreclosure (or any associated document, such as a notice of default) and for which the grantee name does not match regular expressions detecting names of banks and federal entities. This initial search essentially reproduces approaches used in previous studies. In some instances, records coded as REO sales in the first pass are followed by sales from the party previously identified as the REO owner. These later sales are usually the actual REO sale, so in instances where records coded as REO sales in the first pass are followed by records where the REO owner matches the name of the grantor—in addition to other criteria limiting the transaction type and buyer name—I recode this later record as the REO sale. The need for this additional step stems from the manner in which documents are recorded in the local land records. In some cases, REO sales are recorded with the County after the sale out of REO. Documents for these REO sales are nearly always dated earlier, but they are frequently filed with the County at a later date.[2] The grantor in

[2]Records obtained from WCROD contain both document date and recording date. Consistent availability of recording date would obviate many of the coding difficulties associated with documents being recorded after substantial delays, but real-estate records obtained from Social Compact do not contain a recording date field. Additionally, I use the records from the CoreLogic data grant to retrieve additional information, joining the CoreLogic data to the Social Compact and WCROD on parcel number or address and document date. Records in the CoreLogic dataset do not contain the recording date. It would be possible to revise my code to operate separately on the Social Compact data and WCROD data, using recording date for the former and document date for the latter, but this would introduce even greater complexity to an already

the REO sale identified in the first pass often matches the name of the REO owner, but I do not include a criterion in the first pass that the grantor be identical to the party identified as the REO owner due to mergers of lending institutions and transfers to servicers with different names. For example, properties repossessed by Washington Mutual and held in REO inventory though late 2008 were transferred to J.P. Morgan after federal regulators seized and sold off Washington Mutual. In other instances, my coding accepts the name of a trustee in the grantee field of a Sheriff's Deed as the name of the REO owner, but the REO sale lists the servicer responsible for REO disposition as grantor.

Not all REO sales are captured in the local land records, for reasons which are not entirely clear, but are likely due to error on the part of servicers to record these transactions. As a result, some transactions coded as REO sales may actually be the next sale after the REO sale. These cases are impossible to programmatically identify and remove, but manual diagnostics suggest this is a rare occurrence. In other cases, the land records list the legal description of the property, but include neither the street address nor the property tax identification number, which are the two fields used to identify records occurring after a given foreclosure. Records lacking both these identifiers are impossible to link to other records recorded for the same property.

4.2.0.4 Identifying Second Sales

The process of identifying the next sale occurring after a REO sale, should one occur, is similar to the process for identifying REO sales described above. Iterating over records occurring after REO sales, I code records as second sales if they meet the following criteria: they are recorded on or after the date of the REO sale but prior to any subsequent foreclosure, they are not themselves foreclosure-related records, and the grantee name does not match regular expressions for bank or federal entity names. To reduce the likelihood of coding non-sale transfers between related entities, I only accepted Quit Claim

highly complex set of programs for coding records. The multiple passes these programs execute over the records with their different rules perform very well in identifying REO sales and second sales.

Deed records as REO sales where the sale amount is greater than or equal to $500. Document types reliably associated with arm's-length sales, specifically, "Deeds" and Warranty Deeds, are only restricted to records with a sale amount greater than or equal to $1.

4.2.0.5 Identifying Tax Foreclosures

Tax delinquency often signals disinvestment and frequently coincides with or precedes property abandonment (Wilson, Margulis, & Ketchum, 1994). In Detroit, however, tax delinquency is a widespread phenomenon that also stems from tax assessments being set at a substantially higher base than what market values would dictate (Hodge, McMillen, Sands, & Skidmore, 2016). Individuals underwater on their property taxes, i.e., those whose property tax payments exceed the market value of their home, have a powerful incentive to reduce or eliminate property tax payments. Inflated property values and the precarious financial situation of many Detroit residents, in conjunction with the increased enforcement of property tax reversion laws, has led to the repossession of tens-of-thousands of properties since the early-2000s, when an expedited tax reversion process was initiated in Michigan. Federal agencies, private lending institutions, investors owning mortgage-reverted properties, and investors purchasing REOs out of lender inventories, however, possess the resources, if not the mandate, to pay property taxes. Further, these actors are absentee owners; tax-delinquent homeowners in Detroit are often personally invested in their properties and neighborhoods. If homeowner households are not financially investing in their properties, they are at least living in them, indicating a modicum of care. Lender- and investor-owned tax-delinquent properties, however, stem from one of a few likely scenarios, all ruthless. First, current and former REOs may be allowed to fall into tax foreclosure as a passive means of disposing of ostensibly unprofitable properties. Properties considered valuable when high-priced loans could be secured for purchase or refinancing may be considered liabilities from a portfolio management per-

spective.[3] REOs purchased by investors are frequently converted to rentals; in numerous cases these investors extract rent from tenants while withholding property tax payments as a short-term strategy for accumulating wealth at the expense of tenants, who may be evicted as a result of tax foreclosure, neighborhoods, and the municipality.

The mechanics of the Michigan tax foreclosure law, revised and codified in Public Act 123 (1999), enables county governments to repossess tax-delinquent properties after three years of non-payment. Counties then sell tax-reverted properties at auction to recoup delinquent taxes, first for a minimum of the combined delinquent taxes, interest and fees, then, if a property remains unsold, for a minimum of $500. When the county repossesses properties in advance of an auction sale, that action is documented in a Judgment of Foreclosure deed submitted to the WCROD. I use these Judgment of Foreclosure records to identify occurrences of tax foreclosure from 2005 to 2013. Due to a significant delay in Judgment of Foreclosure records being submitted for properties auctioned in 2014, I used records of properties that were offered at the annual property tax auction available from the website of Loveland Technologies, a Detroit-based company focusing on the analysis and visualization of real-estate data. As Judgment of Foreclosure records have not been created and/or recorded yet for the 2015 auctions, I again took advantage of Loveland Technologies for these records.

4.2.0.6 Transactions Involving Multiple Properties

The unit of observation in local land records is the document recording information about sales, transfers, mortgages, liens, etc. for one or more properties. The manner in which these records are handled and sold by third-party vendors like CoreLogic, on the other hand, takes the individual property as the unit of analysis. This conversion creates

[3]Tax delinquency and tax foreclosure also occur on so-called zombie foreclosures, also known as bank walkaways or charge-offs. In these cases, lenders initiate foreclosure, but decide against completing the process after comparing carrying costs and sale prices. In these cases, the borrowers remain responsible for the property, including payment of property taxes. It is extremely difficult, however, to identify zombie foreclosures, as there several other reasons for delays in the foreclosure process, most notably, those stemming from the fallout of the robo-signing scandal.

a situation wherein all properties included in a single transaction document are assigned identical information in separate rows in a table, including sales price. In instances where documents record the sale of multiple distinct properties, these prices need to be broken apart to reflect the unique contribution of each property to the overall sales price. In instances where the two properties are adjacent parcels, usually one containing a structure and one a vacant lot, these records need to be consolidated as the sales price pertains to only one common street address. To address the situation in which a document records a sale of two or more distinct properties, i.e., two or more properties constituting what an ordinary person would consider to be a distinct address, each property is assigned a share of the document sales price proportionate to its share of the assessed value of all properties. Assessed value is taken from Assessor's Office data released in the year nearest the transaction document in question. Where properties need to be consolidated, I assigned the lot size of the adjacent vacant lot to the record for the parcel containing the structure and dropped the vacant lot from the dataset. Duplexes are few in number (~40) and present difficulties for programmatically recreating post-foreclosure pathways; specifically, duplexes vacillate between appearing as joint and separate properties in the transaction records, so I excluded them from analysis.

I first performed these operations for splitting and grouping Sheriff's Deed records. The majority of Sheriff's Deeds listing more than one property are those where one property has a structure, the other is an adjacent vacant lot, and both share a common address. A small number of Sheriff's Deeds list two parcels that together comprise a duplex; these are dropped from the database for the reasons stated above. Next, I searched among REO sales for individual properties constituting part of multiple-property transactions. Since I aggregated Sheriff's Deeds for adjacent parcels sharing a common street address, I found few REO sales belonging to multiple-property transactions. Among the few documents detected among REO sales having two or more properties associated with them (~25), I found instances of records erroneously indicating multiple properties were sold together;

in these cases, the physical document does not list the properties found in the dataset. For this reason, I dropped all REO sales records associated with bundles having more than two properties. Properties listed in multiple-property documents among second sales all seem to reflect the source documents, so sales prices are allocated among properties accordingly.

4.2.0.7 Categorizing Buyers

To categorize REO buyers and buyers of second sales, I followed approaches taken in previous studies. In two recent papers, Ellen, Madar, and Weselcouch (2014) and Immergluck and Law (2014) classified parties purchasing properties out of REO inventories as likely investors if any one of four conditions are met. First, the name of the purchaser contains corporate identifiers, such as "INC" and "LLC"; second, the purchaser name is matched to two or more REO acquisitions or four or more acquisitions of any type during the course of the study period (both studies covered roughly a decade); third, the purchaser resold at least one REO property within 12 months of its purchase. I used each of these conditions, but I revised the second condition by classifying purchasers as likely investors if they purchased two or more properties either out of REO or at the first sale subsequent to a REO sale, in addition to coding buyers as investors if they purchased four or more properties of any type during the study period, i.e., REO or otherwise. REO sales and second sales are similar, at least in Detroit, in terms of participants and prices. In many cases, second sales constitute part of the same market for distressed properties as REO sales.[4] To search for matches among names of buyers, I first normalized buyers' names by removing words, phrases, and acronyms referring to marriage status and tenancy, e.g., 'Joint Tenant with Right of Survivorship', as well as suffixes of individuals' names, e.g.,

[4]I coded investors in two stages. First, I identified investors through corporate identifiers and the total number of acquisitions of REO properties or properties one sale away from REO. I then recoded parties identified as individuals in the first round as investors if they bought four or more properties during the study period, regardless of whether or not these were REO sales. This second step changed the share of purchases by investors by less than one percentage point.

"Jr" and "II." I also removed middle initials and alphabetically sorted the constituent names of each proper name to account for variations in data entry. Where data fields for buyer name contained two or more names, which largely occurs when married couples jointly purchase property, I split these names and counted the number of appearance of each separate name.

Following Ellen et al. (2014), I used normalized buyer names and investor flags to identify investors and classify them as small, medium, or large investors. First, individuals and entities that purchased more than 50 properties were classified as large investors; next, individuals and entities that purchased 10 or more properties were classified as medium investors; finally, individuals and entities that purchased two or more REOs or four or more property of any type were classified as small investors. Buyers with corporate names who purchased only one property were also classified as small investors, as were individuals or entities that purchased only one property, but resold their property within 12 months.

These procedures for classifying likely investors have several known limitations. First, some investors purchased only one property during the study period, leading to an underestimate of investor activity. Ihlanfeldt and Mayock (2014) address these issues by using records of property tax reductions for owner-occupants, but these data are faulty and available only for some years in Detroit. Similarly, Ihlanfeldt and Mayock (2014) point out the number and complexity of transaction documents recorded after mortgage foreclosure may lead to the erroneous coding of lenders' transfers to subsidiary or allied REO management companies as a REO sale. I guarded against this threat to the best of my ability by preventing records having grantee names matching those of known servicers and subsidiaries from being coded as a REO sale.

4.2.0.8 Confirming Sales Prices

Many REO sales have recorded sale amounts of $0, but in some cases this reflects errors in the transcription of the land records. For whatever reason, sales amounts listed on the

physical documents are not always recorded in the electronic land records. Data obtained from the CoreLogic data grant, however, are more likely to list these sales prices. I used these data to update REO sales in the REO pathways database where CoreLogic lists a non-zero sales amount.

4.2.0.9 Adding Geospatial Information

I geocoded records in the REO pathways database using address, city, and zip code fields. In instances where addresses failed to return a result during geocoding, I used parcel numbers to match records to a table of Detroit parcels containing spatial coordinates. Once geocoded, records were assigned census tract numbers.

4.3 Regional Database Construction

My process for creating the regional REO pathways database follows the steps for creating the Detroit database detailed above as closely as possible, but differences in these data necessitated minor departures. First, to identify completed mortgage foreclosures, I used the code RealtyTrac supplies to denote conveyance of trustee's deed upon sale. In addition, I selected records where RealtyTrac codes indicate a sale at auction but the name of the buyer is variant of Mortgage Electronic Registration Services (MERS). Second, given the difficulty of testing parcel numbers across each of these counties for the presence of sales involving adjacent parcels, I dropped all records associated with a transaction identifier linked to two or more properties. These bundles are relatively few in number, particularly among residential properties.

4.4 Identifying Detroit's Strong Neighborhoods Using Cluster Analysis

In previous research, hierarchical cluster analysis (HCA) has proven useful in previous studies for classifying different geographic units, including neighborhoods e.g., Mikelbank, 2004. The purpose of HCA is to group a large number of observations based on similarities in terms of measurements on pre-selected indicators. To identify Detroit's strong neighborhoods, I used HCA to sort Detroit neighborhoods into a limited number of clusters based on their housing market conditions in 2000 and changes in those conditions between 1990 and 2000. Taking census tracts as proxies for neighborhoods, I obtained tract-level data from the GeoLytics Neighborhood Change Database, which contains past decennial census data adjusted to 2000 census tract boundaries. The variables I included in the HCA were: population density in 2000 and its change from 1990 to 2000; housing unit density in 2000 and its change from 1990 to 2000; poverty rate in 1999 and its change from 1989 to 1999; median household income in 1999 and its percentage change from 1989 to 1999; median value of owner-occupied housing in 2000 and its percentage change from 1990 to 2000; owner-occupancy rate in 2000 and its change from 1990 to 2000; and housing vacancy rate in 2000 and its change from 1990 to 2000. In addition, I included the share of residential properties having residential structures in 2009, i.e., the share of residential properties that are not vacant lots, derived from the Detroit Residential Parcel Survey (DRPS), a parcel-by-parcel survey of residential property conditions in Detroit conducted in 2009. Before being entered into the HCA, variables for which increasing measures indicate worsening neighborhood conditions, for example, the vacancy rate, were inverted so that increasing levels for all variables indicated improving conditions. All variables were standardized before running the cluster analysis to account for differences in units of measurement. Tracts with fewer than 100 residential parcels, as per the DRPS, were removed from the analysis to retain only tracts with residential

characteristics, as were tracts showing median home values of zero dollars in either 1990 or 2000.

HCA operates through a process of agglomeration. Each observation, in this case, each census tract, begins as a unique cluster. The next step of the process combines the two most similar observations into a new cluster. In successive stages the two most similar clusters are merged, either individual observations or clusters formed at earlier stages of the analysis, until all observations have been grouped into one final cluster. The convention for determining the final number of clusters is to strike a balance between retaining only a limited number of clusters and keeping highly dissimilar clusters apart. In practice, this means selecting the smallest number of clusters immediately prior to the agglomeration of two highly dissimilar clusters. Following this approach, I extracted three clusters of Detroit census tracts. One of these clusters had very high values for indicators of housing market strength relative to the three others and fits well with my understanding of the location of Detroit's strong neighborhoods. Figure 4.1 shows a truncated dendrogram generated from the cluster analysis, dendrograms being the conventional visualization used to determine the appropriate number of clusters to extract. Horizontal lines represent cluster merges and their corresponding Y-axis values show the distance between the clusters at the point of the merge. Vertical lines represent the clusters constituting part of a given merge. This dendrogram displays the final 20 merges. It shows a clear separation between tracts constituting strong neighborhoods and all other tracts. Median z-scores for the variables entered in the HCA are presented for each of the last three clusters in Table 4.2. This table shows that the cluster selected to represent Detroit's strong neighborhoods has particularly high relative values for the inverse of the poverty rate, owner-occupancy rate, the inverse of the vacancy rate, and the share of residential parcels with structures.[5] Figure 4.2 presents the spatial distribution of these strong neighborhoods.

[5]A common approach for determining the contribution of each indicator in defining the grouping of observations into clusters is linear discriminant analysis (LDA). Applying LDA to the results of the cluster analysis, I found the share of residential parcels having structures was the most influential predictor of the cluster into which a tract was grouped by a wide margin.

Table 4.3 shows how strong neighborhoods compare with other neighborhoods included in the cluster analysis. Overall, these indicators show strong neighborhoods exhibited much stronger housing markets than other residential areas. For example, the median of census tract median household income in 1999 across the strong neighborhoods was $38,810, while the median value for other neighborhoods was only $23,766. Strong neighborhoods were also predominantly owner-occupied; the minimum value from strong neighborhoods exceeds the median for other neighborhoods. The median poverty rate in strong neighborhoods is half the median rate in other neighborhoods. However, 15% is not negligible. As scholars such as Galster (2005) have argued, poverty rate between 15 to 20% could be a critical threshold for neighborhood change. Below this threshold, problems associated with poverty may not significantly and negatively affect the neighborhood; above this, problems with increased poverty may rise significantly. Thus, while these tracts are strong relative to others in Detroit, many had challenges even before the housing crisis. An important question to ask is how well these neighborhoods have endured the additional stresses imposed by mortgage foreclosures and the great recession that followed. The last indicator in the table describes the neighborhoods' physical environment. The median share of residential parcels with structures in the strong neighborhoods was 96%, much higher than the median share in other neighborhoods, 67%. Since the survey was conducted a few years after the mortgage foreclosure crisis started, it implied that these strong neighborhoods were largely intact prior to the housing crisis. Tracts in other neighborhoods, however, exhibit higher maximum values for median housing value in 2000 and the maximum for the share of residential parcels having structures is nearly identical to that for strong neighborhoods. The absence of these tracts from the cluster of strong neighborhoods is explained by the particular combination of measures on the indicators included in the cluster analysis. For example, the tract included among other neighborhoods with the median home value of $457,700 has

an owner-occupancy rate of just 24% and a median household income of $25,838.[6]

4.5 Identifying Detroit's Inner- and Outer-Ring Suburbs

A central question of this dissertation is whether federal and private entities treated mortgage-reverted properties differently in Detroit, particularly within the city's strong neighborhoods, than in outlying suburban areas. Previous studies have established a convention of separating metropolitan areas into the categories of inner-city, inner-ring suburban, and outer-ring suburban, with the occasional inclusion of exurban (Hanlon & Vicino, 2007; S. Lee & Leigh, 2007; McMillan & Chakraborty, 2016). A central assumption of the approaches used to distinguish among these spaces is a concentric pattern of urban development, an assumption more likely to hold true in regions including older industrial cities like Detroit. This model of concentric rings of ever-newer development surrounding older central cities ultimately fails at large distances, where distant concentric bands overlap with rural hinterland or the suburbs of other urban areas. The nine-county Detroit metropolitan area contains historic nodes of urban development other than Detroit, each with suburbs in their orbit, including Ann Arbor in Washtenaw County and Flint in Genesee County. Proximity to these other major urban areas is likely to influence REO disposition above and beyond what might be expected given distance from Detroit. For this reason, I consider only the Detroit tri-county area, which includes Oakland, Macomb, and Wayne counties. I identified Detroit's inner- and outer-ring suburbs using the same criteria applied by Hanlon and Vicino (2007) in their study of Baltimore's inner-ring suburbs. First, using 2000 census county subdivisions as the areal unit of analysis, I selected all subdivisions sharing a boundary with the city of Detroit, excluding Hamtramck and Highland Park, which are both fully contained within the city of Detroit. Second, I selected all county subdivisions touching the subdivisions selected in the first step having more than 50% of their housing stock built prior to 1970, according to the 2000 census. The

[6]This is the Gold Coast area in Detroit, located on the river on the inner east side.

city of Pontiac was excluded from analysis because of its dissimilarity with other places in the tri-county area outside of the inner-ring suburbs. Located in central Oakland County, Pontiac is an older industrial city that has experienced decades of job and population loss similar to Detroit. Figure 4.3 shows the location of inner- and outer-ring suburbs in the Detroit tri-county area.[7]

[7]Following the work of Orfield (1999), I also conducted a cluster analysis of county subdivisions in the tri-county area to identify inner- and outer-ring suburbs based on a range of indicators used to distinguish among different sections of metropolitan areas. I selected housing unit density, median age of housing structures, median values of owner-occupied housing units, and the owner-occupancy rate—all from the 2000 census—-as indicators for distinguishing between inner-ring and outer-ring suburbs. The results of this analysis were nearly identical to those obtained using adjacency to Detroit and the predominance of pre-1970s housing stock. The cluster analysis, however, selected some outlying areas into the cluster covering the clear candidates for inner-ring suburban. I followed the approach taken by Hanlon and Vicino (2007) given its simplicity and overall agreement with more sophisticated techniques, i.e., cluster analysis.

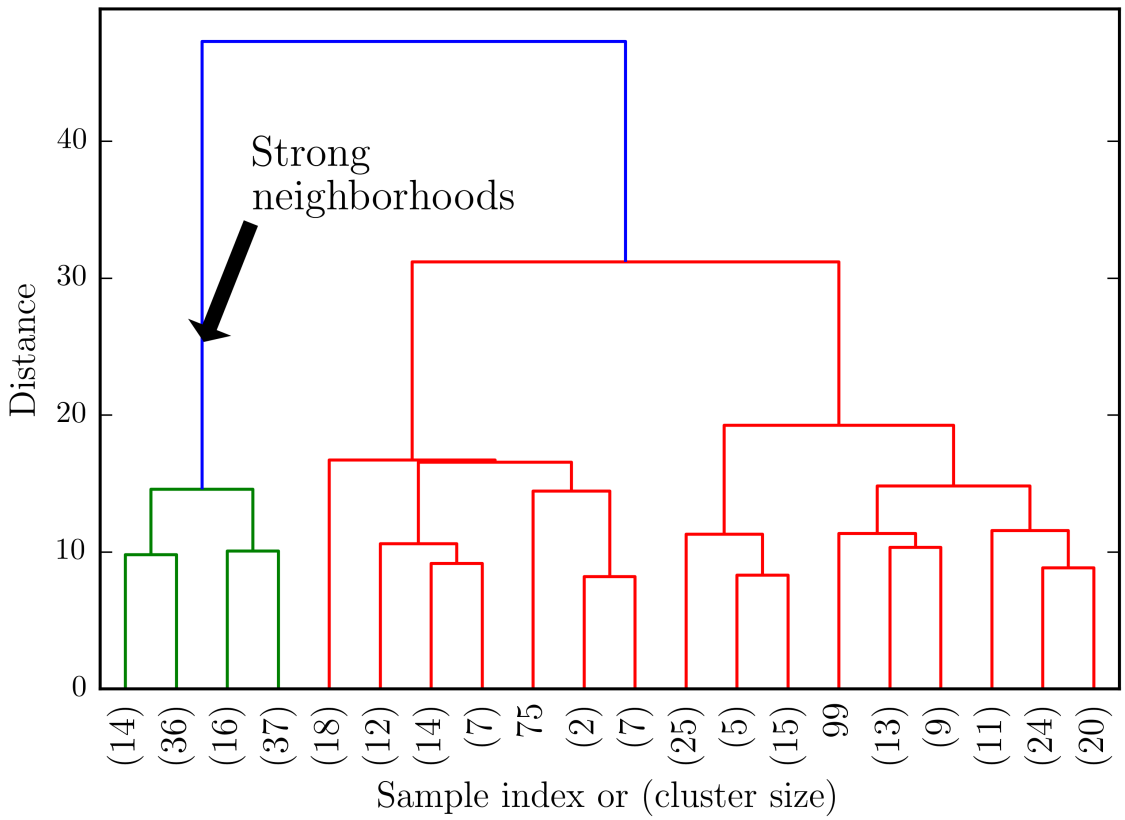

Figure 4.1: Truncated Dendrogram of Hierarchical Cluster Analysis. Sources: Author's calculation from GeoLytics, Inc. (2003).

Table 4.1: Data Sources for Detroit REO Pathways Database

Source	Description	Coverage
City of Detroit Assessor's Office	Annual tax assessment records	2006, 2009, 2010, 2012
City of Detroit Open Data Portal	All property-based violations adjudicated by the City of Detroit Department of Administrative Hearings	2005 to 2016
CoreLogic	Records awarded from CoreLogic containing all deed types, but for which the names of the buyer and seller were redacted	01/01/2003 to 09/12/2014
CoreLogic through Michigan Community Resources	Records purchased from First American CoreLogic by Social Compact and provided by Michigan Community Resources containing records of mortgage foreclosures, market sales, property transfers, REO sales, and REO transfers	01/01/2005 to 12/31/2007
Loveland Technologies	Website listing Detroit properties offered at property tax auction	2014 and 2015
Wayne County Register of Deeds through Data Driven Detroit	Records purchased from the WCROD by Data Driven Detroit containing Warranty Deed, Quit Claim Deed, Sheriff's Deed, and Judgment of Foreclosure records	01/01/2012 to 12/31/2013
Wayne County Register of Deeds through Michigan Community Resources	Records purchased from the WCROD by Michigan Community Resources containing Deed, Warranty Deed, Quit Claim Deed, Sheriff's Deed, and Judgment of Foreclosure records	01/01/2008 to 12/31/2011
Wayne County Register of Deeds Web Portal	Online database of local land records. Used to obtain Redemption Receipts and Notices of Release of Foreclosure	01/01/2005 to present

Table 4.2: Median Z-Scores for Indicators of Neighborhood Strength by Cluster

	Cluster number		
Indicator	566[a]	569	570
Poverty rate 1999 (inverse)	1.10	-1.06	-0.35
Owner-occupancy rate 2000	1.01	-0.78	-0.29
Share of residential parcels having structures	0.99	-1.54	0.04
Housing occupancy rate 2000	0.97	-0.96	-0.10
Median household income 1999 (log)	0.94	-1.04	-0.27
Difference in housing unit density 1990–2000	0.74	-1.01	-0.01
Median value owner-occupied housing 2000 (log)	0.70	-1.09	-0.11
Population density 2000	0.38	-0.91	0.21
% change in median home value 1990–2000	0.37	-1.01	0.09
Difference in population density 1990–2000	0.34	-1.00	-0.11
Difference in housing occupancy rate 1990–2000	0.33	-0.63	-0.10
Housing unit density 2000	0.20	-0.84	0.14
Difference in owner-occupancy rate 1990–2000	-0.20	0.55	-0.15
Difference in poverty rate 1989–1999 (inverse)	-0.46	0.42	0.21
% change in median household income 1989–1999	-0.61	0.50	0.08
Number of tracts	103	61	123

[a] Cluster identified as strong neighborhoods

Sources: Data Driven Detroit (2010), GeoLytics, Inc. (2003).

Table 4.3: Comparison of Strong and Other Neighborhoods on Select Indicators of Housing Market Strength

	Strong Neighborhoods			Other Neighborhoods		
	Min	Median	Max	Min	Median	Max
Median household income 1999	$25,051	$38,810	$110,745	$11,797	$23,766	$39,787
Median housing value 2000	$43,000	$74,700	$315,100	$9,999	$39,200	$457,700
Owner-occupancy rate 2000	49%	73%	98%	4%	48%	68%
Poverty rate 1999	3%	15%	33%	13%	33%	58%
Share of residential parcels having structures	74%	95%	99%	17%	67%	97%

Sources: Data Driven Detroit (2010), GeoLytics, Inc. (2003).

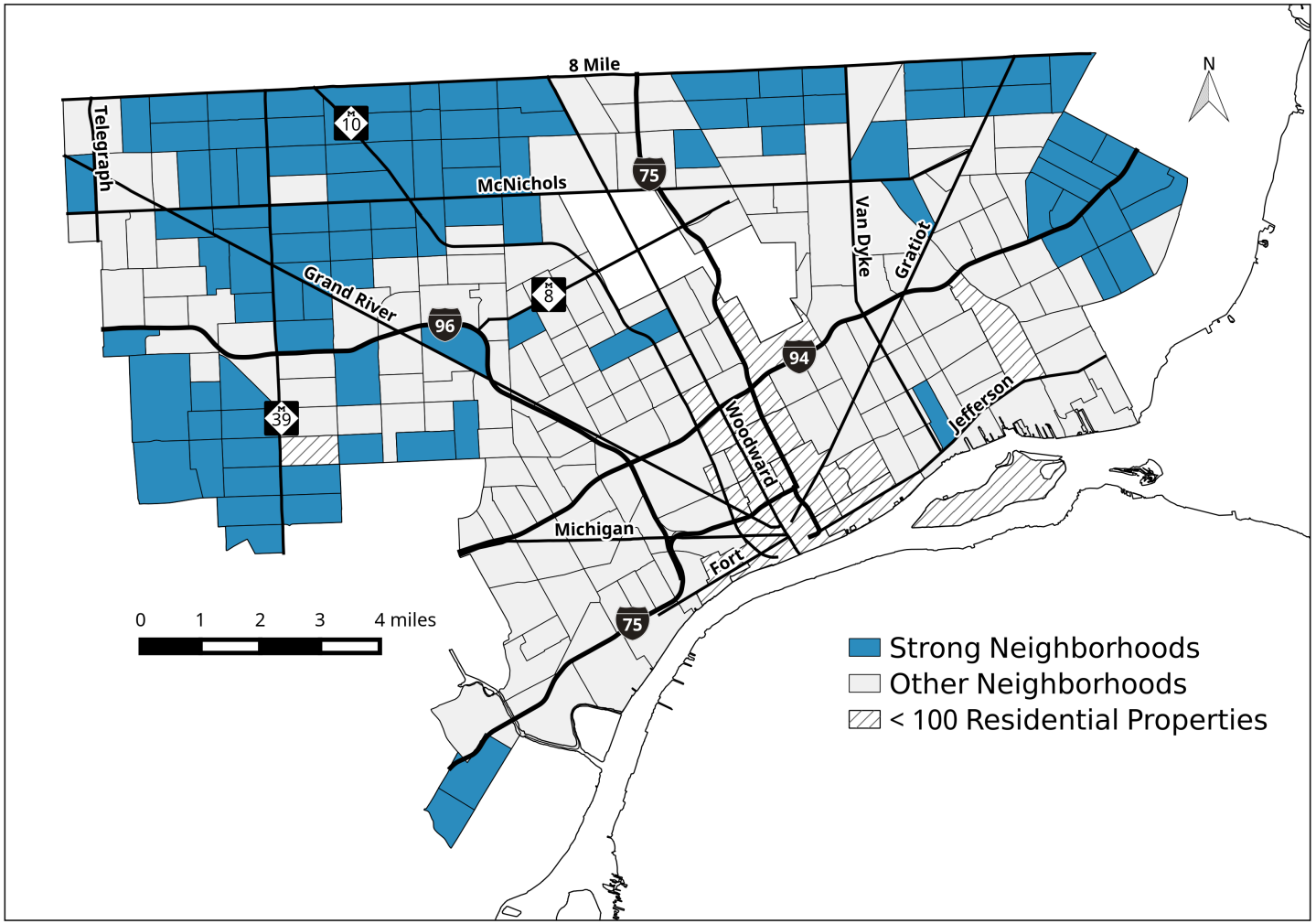

Figure 4.2: Map of Strong and Other Neighborhoods in Detroit. Sources: Data Driven Detroit (2010), GeoLytics, Inc. (2003).

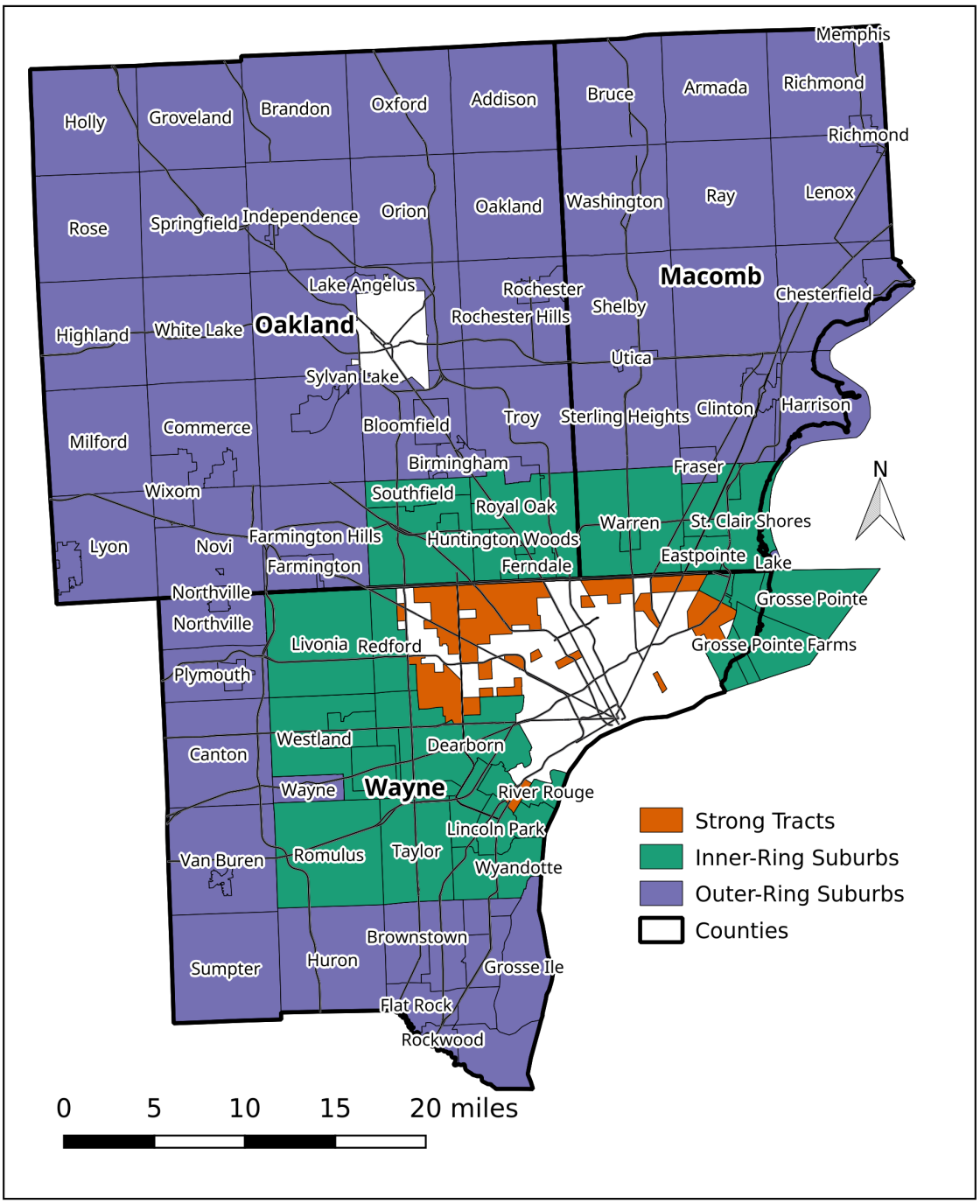

Figure 4.3: Detroit's Strong Neighborhoods and Inner- and Outer-Ring Suburbs. Sources: Author's calculation from GeoLytics, Inc. (2003).

CHAPTER V

REO Stocks in the Detroit Tri-County Area

5.1 Detroit REO Stocks 2005-2013

The vast majority of completed mortgage foreclosures—fully 97%—entered REO inventory. Table 5.1 shows the number and share of properties acquired by each type of participant in the Sheriff's sale. Government entities—excluding federal entities—and nonprofits purchased just 0.1% of mortgage foreclosures at auction. The majority of these were taken by the Michigan State Housing Development Authority (MSHDA) due to its role in financing home loans for low-income households. Several others were taken by Habitat for Humanity due to its modest role in financing home purchases. Parties classified as "likely individuals" acquired 248 properties over this period, though some of these buyers may actually be investors I was unable to classify as such due to data limitations. Parties classified as "likely investors" purchased roughly 1,700 properties, accounting for 2.4% of properties offered at auction. The remainder of mortgage foreclosures became REOs. Private entities, i.e., banks and the various parties acting on behalf of investors in mortgage-backed securities, repossessed nearly 60% of completed mortgage foreclosures. Fannie Mae repossessed nearly 20%, HUD 15%, Freddie Mac fewer than 5%, and the VA less than 1%. The combined share of all REOs entering federal inventories is 37%, equivalent

to 10% of all residential properties in Detroit.[1]

Counting the number of REOs owned or serviced by individual private institutions is more challenging than finding the number of properties repossessed by specific federal entities. Financial institutions named in local land records represent one or more of three primary interests in mortgage foreclosures: mortgage holders, servicers, and trustees. Separate divisions within large financial institutions, or subsidiaries of these institutions, may service the loans for which another division acts as trustee. In other instances, a division of one company may serve as trustee while a separate company may act as servicer. Local land records may record the names of one or more of these entities performing these various functions, creating difficulties in programmatically assigning properties to one particular coporation or another. Further, each name is subject to variation across records (e.g., Bank of America and BAC, which stands for Bank of America Corporation). To generate a list of the largest private entities responsible for REOs and a rough estimate of their inventories, I obtained the names of the nation's largest mortgage servicers, many of them also mortgage lenders, and queried for their presence among REO sales records.[2]

Table 5.2 shows the five largest private entities named in land records for REOs in Detroit and the number of REOs for which they are the seller of record. Together, these entities account for just above 50% of privately held REOs in Detroit. The list of the largest private owners of REO properties roughly corresponds with the relative position of the nation's largest servicers in terms of their national servicing volume in 2008 (see Table 5.3). The top REO owner, Deutsche Bank, while absent from the list of the nation's largest servicers, was among the largest backers of subprime loans in the 2000s. Deutsche contracted with third-party entities, particularly Ocwen Financial, to service the loans

[1]From here on, "likely individuals" and "likely investors" will simply be referred to as individuals and investors, respectively, througout this document.

[2]These records contain more information than Sheriff's Deed records about mortgagees and/or servicers, particularly where MERS is listed as the grantee. This query thus excludes owner information for REO records not sold during the study period, but the substantial gap between the properties repossessed by the top five corporations and all other corporations indicates the inclusion of these records would not alter change the order of these largest corporate REO owners, servicers, and trustees.

backing the mortgage-backed securities for which Deutsche served as trustee.

Just as the number of completed mortgage foreclosures grew at a rapid pace from 2005 to 2007, so too did the number of properties flowing into REO inventories (see Figure 5.1).[3] The annual number of properties entering private inventories grew 156% during this two-year period, rising to a peak of 12,000. The pace of properties entering federal inventories was slow relative to the surge experienced by private entities, but far from trivial. The two-year growth rate was 87% for the GSEs and 56% for HUD. While the number of properties entering private inventories fell precipitously after 2007, the number of properties entering federal inventories continued to grow through 2010 before falling toward their 2005 levels. The abrupt decline of properties entering private inventory is partially explained by the moratoria on mortgage foreclosures observed by many servicers in 2008 and 2009. The growing rate of REOs entering federal inventories reflects national trends (see Figure 3.1), and stems from foreclosures spreading from unsustainable subprime loans to prime and near-prime loans held or securitized by the GSEs in 2008. Some suggest the 2010 spike in GSE acquisitions stemmed from the widespread cancellation of HAMP trial periods (Gaffney, 2010). Investigative reporters at *The Detroit Free Press* acquired records from the GSEs in 2011 indicating the entities required mortgage servicers to foreclose on a fixed share of delinquent loans, which may also be partially responsible for the continued flow of properties into GSE inventories Dixon (2011).

Changes in the number and acceleration of REO sales largely echo the accumulation pattern described above. Private entities rapidly increased their rate of REO sales in 2007 and 2008 in response to the enormous influx of mortgage-reverted properties. While the year-over-year change in the number of private entities' REO sales fell from nearly 100% in 2008 to negative 40% in 2009, private entities as a whole sold more than 60% of their inventory that year.[4] After 2010, the number of properties entering private REO inventories

[3] VA figures are omitted from this figure and all subsequent analyses due to the small size of its inventory. REO stocks are calculated as the annual cumulative total properties flowing into REO inventories less the annual cumulative total properties sold out of REO.

[4] To reiterate, my estimation of sales and inventory are restricted to REO starts between 2005 and 2013.

again climbed above the number of REO sales, but the combined annual inventory had by then fallen below the 2005 level. The GSEs increased their sales at roughly the same rate as private entities through 2008, but sustained their 2008 level of nearly 2,000 per year sales through the study period, which translates to sales of between 40 and 50% of inventory every year. HUD sales, on the other hand, were virtually non-existent prior to 2009. As a result, they possessed nearly twice the 2008 inventory of the GSEs. In 2009, however, HUD sold nearly 3,000 homes, equivalent to half their current inventory. HUD sales have slowed since 2009, but still outpace the rate at which HUD accumulates REOs. This initial delay in HUD's disposition is taken up again later in the survival analysis of properties leaving REO stocks and hedonic estimation of the impact of properties lingering in REO inventory on adjacent home sales prices.

In terms of the spatial distribution of REO accumulation, strong neighborhoods had more REOs per residential structure (31%) than the rest of the city (21%), mirroring differences in foreclosures rates between these two areas (see Table 5.4). While strong neighborhoods contain 51% of Detroit's residential structures, they contained 60% of the city's mortgage foreclosures during the study period. The high concentration of REO properties in Detroit's strong neighborhoods, 38% of which were held in federal inventories, indicates the importance of REO disposition strategies in shaping these neighborhoods' future. Figure 5.2 compares the rate of REO starts and sales between strong neighborhoods and neighborhoods over the study period. It shows that while a larger share of residential properties in strong neighborhoods were repossessed and sold than in other neighborhoods, relative changes in REO starts and sales are generally similar between these two types of neighborhoods.

As a result, I am unable to provide perfect representations of inventory in the initial years of the study period.

5.2 Regional REO Trends

Figure 5.3 shows the number of REO starts per 1,000 housing units in Detroit's strong neighborhoods and inner- and outer-ring suburbs. Compared to Detroit's strong neighborhoods, a much smaller share of suburban housing units became mortgage-reverted, with outer-ring suburbs having the smallest rate of REO starts. The greatest difference between Detroit and suburban locations lies in their share of properties repossessed by private entities. Nearly 50 out of every 1,000 housing units in Detroit were repossessed by private entities in 2007, while the comparable peak values are 12 and 8 REO starts per 1,000 housing units for inner- and outer-ring suburbs, respectively. This enormous difference between Detroit and suburban locations is likely explained by the larger share of private label subprime loans issued in Detroit in the early 2000s. These three locations are far more similar, however, in their share of properties repossessed by federal entities, but the the inner-ring suburbs still exhibit a lower rate of properties entering federal inventory than Detroit, and the outer-ring suburbs still exhibit a lower rate of properties entering federal inventory than inner-ring suburbs.

The regional spatial distribution of REOs is shown in Figure 2.5. This map presents the number of REO starts, at the tract level, between 2005 and 2013 divided by the number of mortgageable properties.[5] Within the city of Detroit, strong neighborhoods clearly have the highest mortgage-reversion rates, as noted in Chapter II. Inner-ring suburban tracts immediately adjacent to Detroit have similarly high mortgage-reversion rates. Within Macomb County, REO starts are concentrated along the I-94 corridor, continuing into the outer-ring suburbs and intensifying at county's eastern boundary at New Haven. Within outer-ring suburban Oakland County, tracts located in the city of Pontiac exhibit the highest mortgage-reversion rates. As noted in the previous chapter, Pontiac was excluded from inclusion in the outer-ring suburban area. The bulk of Wayne County is covered by Detroit and inner-ring suburbs.

[5]See Ellen et al. (2014) for construction of mortgageable property variable.

Table 5.1: Completed Mortgage Foreclosures by Type of Buyer at Sheriff's Auction, Detroit, 2005–2013

Owner	Foreclosures	Share of Total Foreclosures
Private Entities	41,460	59.70%
Fannie Mae	12,756	18.37%
HUD	9,981	14.37%
Freddie Mac	2,822	4.06%
Likely Investors	1,663	2.39%
VA	443	0.64%
Likely Individuals	248	0.36%
City and Nonprofit Entities	70	0.10%
Total	69,443	100.0%

Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 5.2: Five Largest Private REO Owners, 2005–2013

Institution	REOs	Share of Private REOs	Share of All REOs
Wells Fargo (Wachovia)	5,278	12.7%	7.8%
Deutsche Bank	4,783	11.5%	7.1%
JPMorgan Chase (Washington Mutual, Long Beach)	4,452	10.7%	6.6%
Bank of America (Countrywide, LaSalle)	4,396	10.6%	6.5%
U.S. Bank	2,526	6.1%	3.7%
Total Top Five	21,335	52.8%	31.8%
Total Privately Held REOs	41,460	100.0%	60.2%

Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 5.3: Top 10 Residential Servicers Ranked by National Volume, 2008

Company	Home Office	Volume	Market Share
Bank of America	Charlotte, NC	$2,056,043	19.30%
Wells Fargo & Company	San Francisco, CA	$1,780,884	16.72%
Chase	Iselin, NJ	$1,503,230	14.11%
Countrywide	Calabasas, CA	$1,485,285	13.94%
CitiMortgage	O'Fallon, MO	$809,633	7.60%
Ally Bank	Bloomington, MN	$396,333	3.72%
PNC Mortgage	Miamisburg, OH	$187,110	1.76%
OneWest Bank	Pasadena, CA	$162,000	1.52%
SunTrust Bank	Richmond, VA	$159,663	1.50%
PHH Mortgage	Mt. Laurel, NJ	$149,756	1.41%
Total Top 10 Servicers		$8,689,937	81.58%

Source: MortgageStats (n.d.).

Table 5.4: REO Concentrations in Strong and Other Neighborhoods, 2005–2013

Characteristics	Strong Neighborhoods	Other Neighborhoods	Total
Tracts	103	184	287
Residential parcels with structures	128,190	123,607	251,797
Share of structures	51%	49%	100%
Total REO properties	40,117	26,454	66,571
Share of all REO properties	60%	40%	100%
REOs as share of area structures	31%	21%	26%
Share of area REOs by owner:			
Fannie Mae	19%	19%	19%
Freddie Mac	4%	4%	4%
HUD	15%	15%	15%
All federal	38%	38%	38%
Private Entities	62%	62%	62%

Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

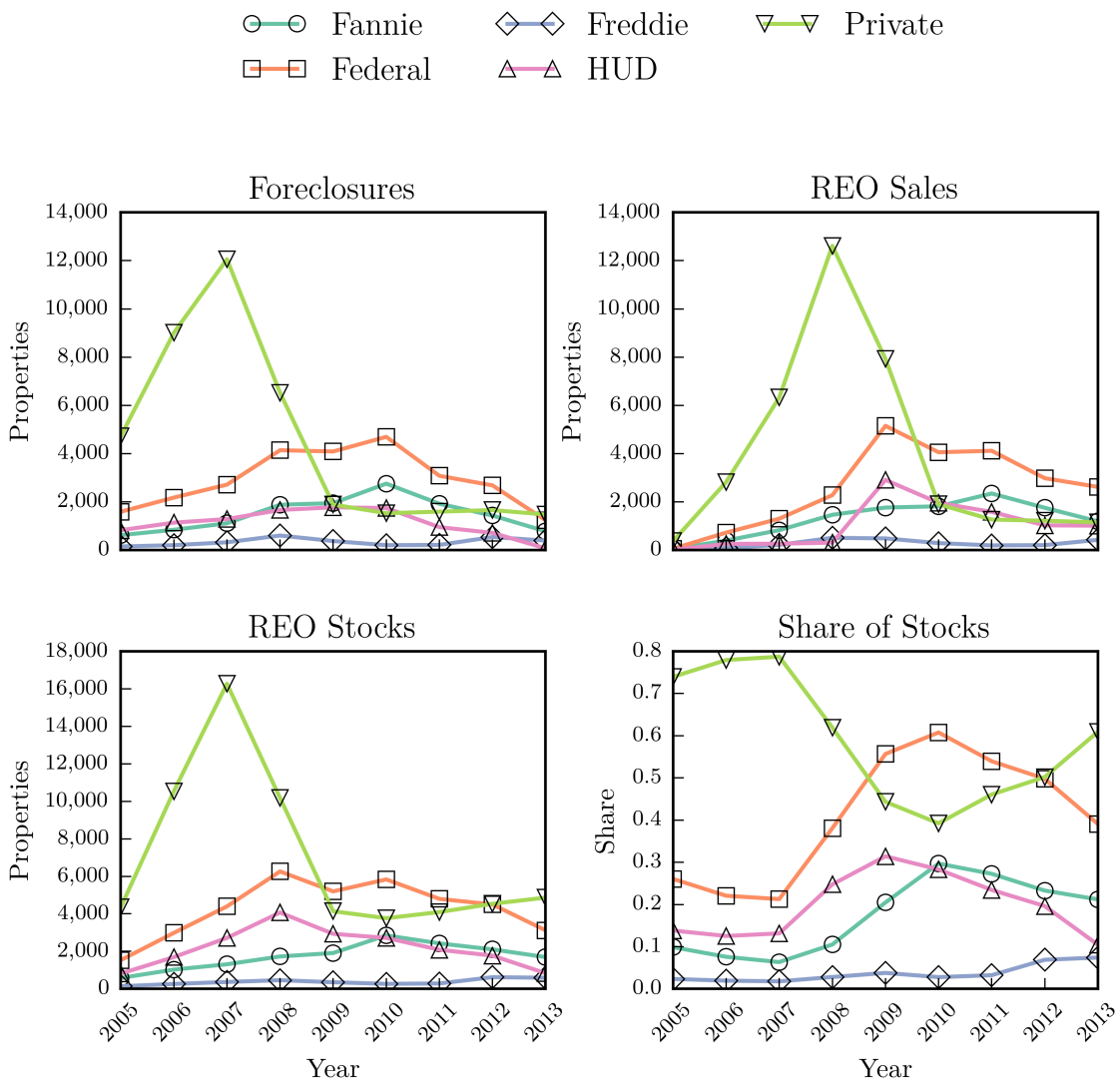

Figure 5.1: REO Starts, Sales, and Stocks in Detroit by Owner, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

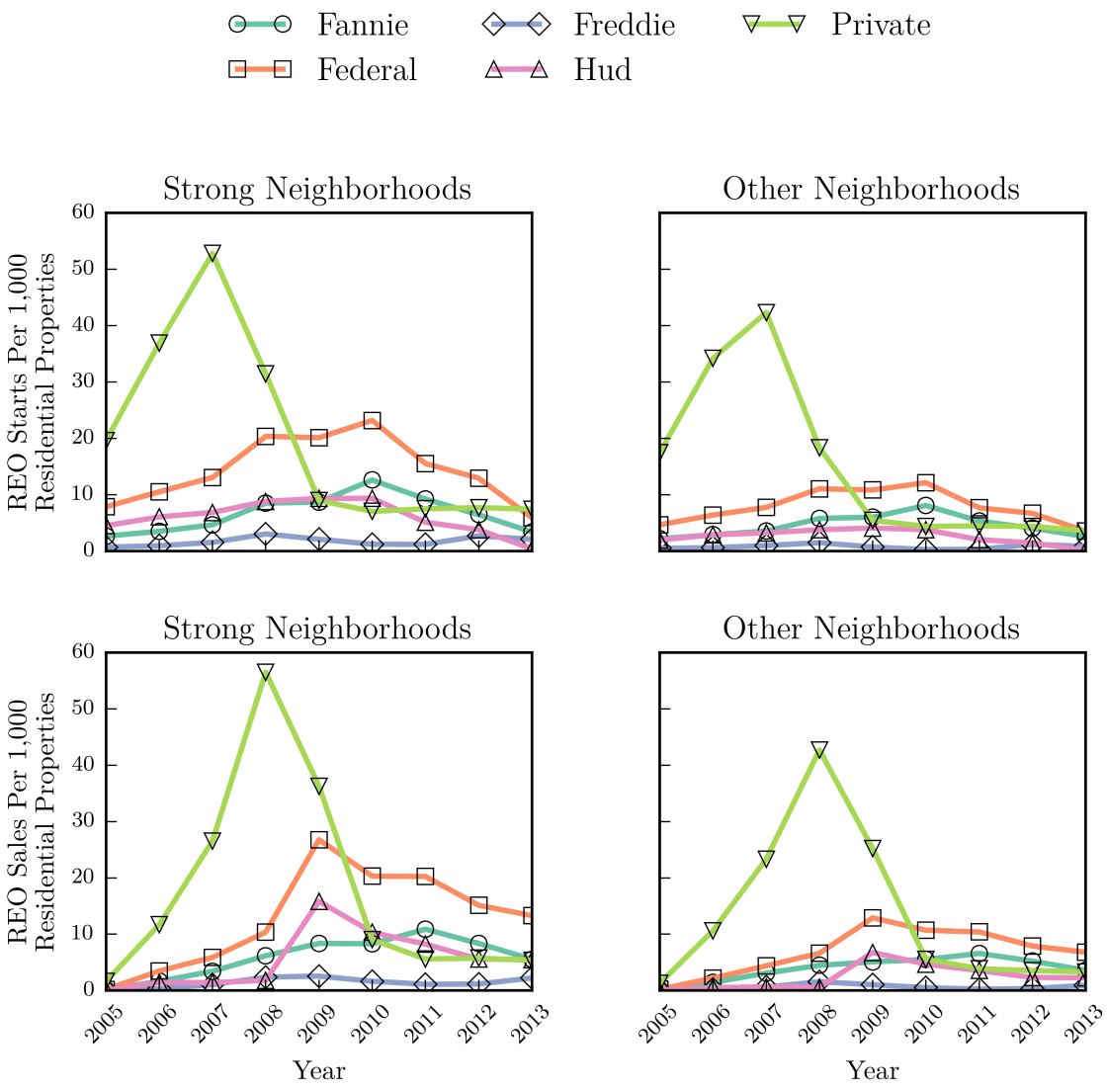

Figure 5.2: REO Starts and Sales in Strong and Other Neighborhoods, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

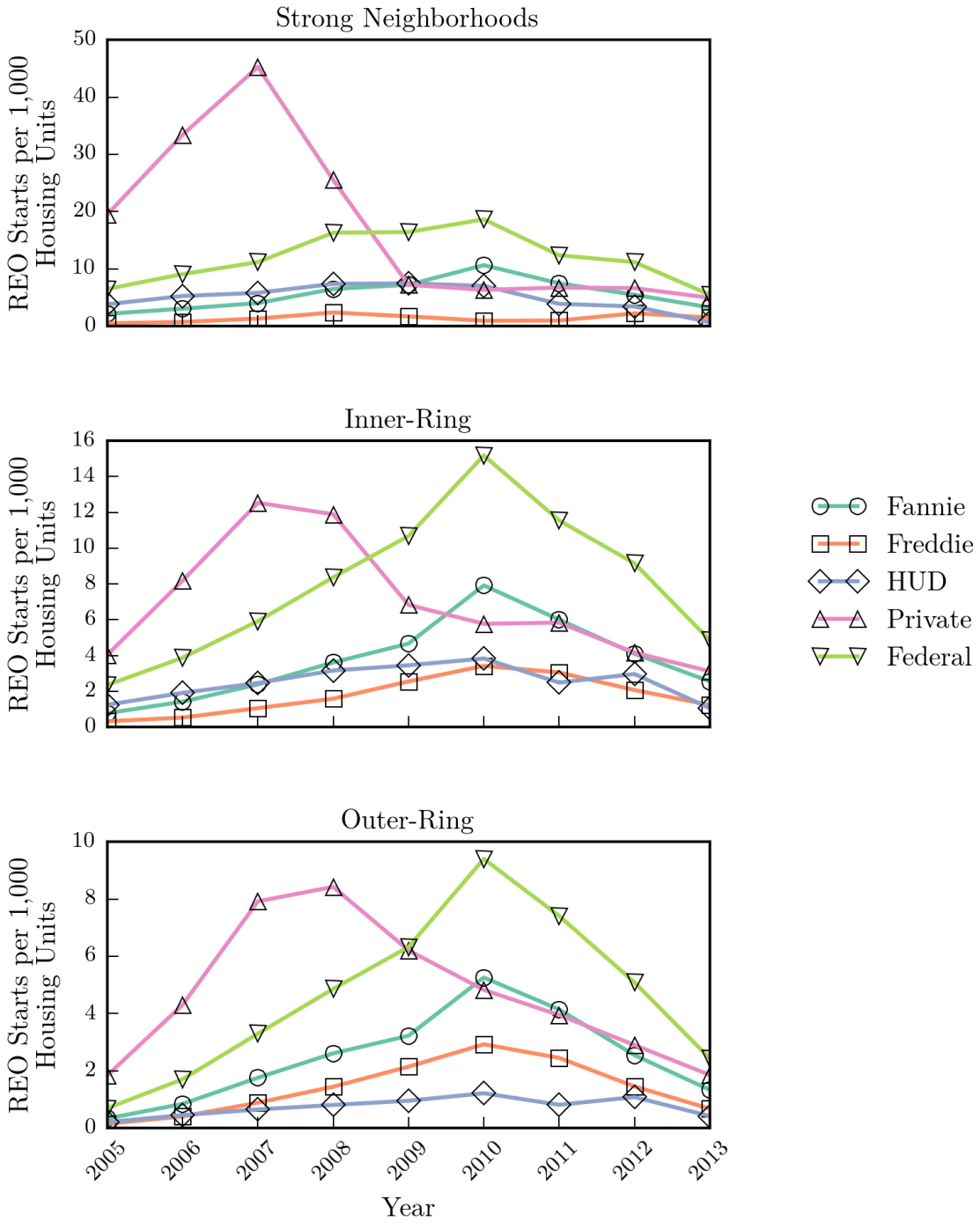

Figure 5.3: REO Starts in Detroit's Strong Neighborhoods and Suburbs, 2005–2013. Sources: RealtyTrac (2015b), U.S. Bureau of the Census (2000).

CHAPTER VI

Investor and Owner-Occupant REO Acquisitions and Post-Sale Outcomes

In this chapter I argue that both federal and private REO owners' practices for managing and disposing of REOs led to a preponderance of mortgage-reverted residential properties in Detroit being sold to investors, many of them large out-of-state operators. In turn, I argue, the harmful business models employed by many of these investors have substantially undermined conditions in Detroit's historically intact middle- and working-class neighborhoods, threatening their continued existence as Detroit's established middle-income homeowner enclaves. In Chapter III, I discussed the build-up of private and federal REO inventories, both nationally and in Detroit in the wake of the mortgage foreclosure crisis, and the pressure placed on the GSEs and HUD to reduce their inventories. Here, I argue these pressures may have led federal entities to dispose of properties located in these neighborhoods through bulk sales, rather than retail means, and to invest less in repairs than would have been helpful in maximizing homebuyer interest. In other words, the evidence in this chapter suggests federal agencies' mandate to balance their books may have come at the expense of their mandate to expand homeownership and stabilize neighborhoods in placed like Detroit's strong neighborhoods.

In this chapter I begin by reviewing the literature on the neighborhood impact of investor-buyers. I then discuss aspects of federal entities' practices and the environmental

constraints and pressures they face in terms of how they tilt REO sales toward investors, particularly in declining housing markets. To establish these assertions, I then present descriptive statistics of the different rates at which federal and private entities sold REOs to investors and other types of buyers, both across time and across metropolitan space. I also discuss trends in the sale price of REOs to shed light on differences in the prices paid by homebuyers and investors. As the types of properties in each entities' portfolios differ, particularly in terms of size and the specific characteristics of the neighborhood in which they are located, I next present the results of a statistical analysis of the likelihood of Fannie Mae, Freddie Mac, and HUD selling an REO to an investor after controlling for property- and neighborhood-specific conditions, as well as temporal changes.

After these descriptive and inferential analyses of REO owners' propensities for selling properties to investors and how they vary across time and space, I discuss the concrete impact of investor acquisitions, focusing on the City of Detroit, where investor activity was far greater than in the suburbs. While a number of recent studies have examined the location, extent, and implications of investor acquisitions of REO properties (Immergluck & Law, 2014; McMillan & Chakraborty, 2016; Molina, 2015), few have examined whether or not high rates of investor activity actually negatively impact neighborhood conditions (for exceptions, see Coulton et al., 2008; Ford et al., 2013; Hwang, 2015). In the final sections of this chapter, I argue investor activity, particularly the activity of large investors, is strongly linked to negative outcomes, specifically, flipping, municipal blight violations and tax foreclosure.

6.1 Investor Ownership and Its Challenges

While investors have long accounted for a significant portion of the market for distressed properties (Satter, 2010; Sternlieb, 1966), their role in the market for such properties increased significantly following the foreclosure crisis. Immergluck (2012) found that investors consistently accounted for 40% of REO acquisitions in Atlanta from 2005

to 2009. Ford et al. (2013) similarly found that investors dominated the market for foreclosures in Cleveland, and my research shows that investors accounted for 68% of REO sales from 2005 to 2013, with investor activity substantially higher (75%) between 2005 and 2008 than it was between 2009 and 2013 (62%). Investors have been found to be most active among buyers of low-value properties. Immergluck (2012) found that investors purchased the majority of the surge of low-value properties (< $30,000) sold in Atlanta in 2008 and 2009. Ellen et al. (2014) found similar patterns in their study of Atlanta, Miami, and New York, with investors being far more likely to buy low-value properties, particularly prior to 2010. In their study of post-foreclosure pathways in Los Angeles, Pfeiffer and Molina (2013) found that investors were most active in neighborhoods with lower incomes and high foreclosure rates. In short, there is overwhelming evidence of investors targeting vulnerable neighborhoods in the wake of the foreclosure crisis, including those in Detroit's middle- and working class neighborhoods.

As noted above, investors are not inherently bad for neighborhoods. Investors have long played a vital role in supplying rental housing, but some types of investors attracted to lower-income neighborhoods are linked to negative outcomes, as demonstrated in this study. This study has identified the substantial presence of "flippers," which purchase low-value properties and (attempt to) sell them quickly in as-is or similar condition (Mallach, 2010). I have also identified the presence of "milkers," who purchase distressed properties and rent them in as-is condition with minimal, if any, maintenance. Milkers are similar to contract sellers, who sell properties at inflated prices in as-is condition on contract, making buyers responsible for maintenance and property taxes. Contract sellers often structure their deals to precipitate the eventual default of buyers, who are vulnerable to summary eviction (Satter, 2010). Some investors, usually those with local ties, pursue strategies predicated on property appreciation. These include rehabbers, who purchase, improve, and resell properties at a profit, and holders, who rent their properties but maintain or improve their conditions based on an expectation of medium-to-long-term market

improvement. While there is very little research indicating the relative share of each type of investor among buyers of REO properties in different markets, studies of cities hit hard by the foreclosure crisis find strong connections between investor activity and negative outcomes. Ford et al. (2013) found that Cleveland REOs acquired by investors had a high likelihood of being abandoned, condemned, subject to demolition, or tax delinquent. Hwang (2015) found a similar association between investor buyers of REOs in Boston, with investor-owned properties being more likely to be associated with a service request. These studies also found that large and non-local investors were more likely to be associated with negative outcomes than smaller and local investors (Ford et al., 2013; Herbert et al., 2013).

While investor ownership is linked to negative outcomes in hard-hit neighborhoods, owner-occupancy, conversely, is linked to neighborhood stability (Rohe & Stewart, 1996). At the most basic level, homeownership insures occupancy. Investor-owned properties, particularly those purchased by flippers and other types of speculators, often remain vacant and susceptible to deterioration. Investor-owned rentals can also lead to blight, as many investor landlords seek only short-term revenues, deferring or abstaining from maintaining their properties. Homeowners, on the other hand, have a strong incentive to maintain and invest in their properties, as these serve as a primary source of equity for average households. The presence of homeowners can also attract other homeowners, leading to a virtuous cycle of investment and improvement (G. C. Galster, 1987).

6.2 Institutional Sales Practices

As discussed in Chapter III, federal entities have a number of programs intended to help homeowners, nonprofits, and local governments compete in the market for REOs. The focus of the present chapter is on homeowners, as the share of properties purchased by local government entities and nonprofits during the study period is extremely small (Ellen et al., 2014). Both HUD and the GSEs have exclusive listing periods during which

investors are excluded from bidding on properties ("First Look"). Further, both entities offer financing with flexible terms like low down-payments. The specifics of how federal REOs are managed and marketed in places like Detroit, however, creates difficulties for prospective owner-occupants seeking to take advantage of these programs. For instance, HUD does not make repairs to bring their properties up to standards for FHA-insurance eligibility. Buyers must pay for such properties in cash. The GSEs, on the other hand, repair a larger share of their inventory nationally, increasing their attractiveness to homebuyers, but the geographic distribution of repairs is unknown (U.S. Government Accountability Office, 2013). Despite this higher national rate of repair for the GSEs, they likely make minimal repairs in Detroit properties, directing their resources to markets they deem safer and more remunerative. Recent examinations of REOs in neighborhoods of color in central cities nationwide found that Fannie Mae, along with a number of large lender servicers, systematically allowed a much larger share of its urban properties to fall into disrepair relative to those in suburban and predominantly white neighborhoods (National Fair Housing Alliance, 2014b). Further, both HUD and the GSEs sell properties in as-is condition alone, meaning properties are sold without any guarantee as to their condition or the perfection of title. This greatly increases the risk posed by the sale to the buyer, dampening demand among prospective owner-occupants (H. Thomas, 2015). Online consumer affairs discussion boards also contain numerous complaints about Fannie Mae's systems for selling properties. For instance, complaints have been filed about the listing agents contracted to sell Fannie Mae's REOs, including listing agents' refusal to work with buyers seeking financing and listing agents not responding to bids in time to take advantage of exclusive listing periods ("Top 93 Complaints and Reviews about Fannie Mae," n.d.).

Protocols for pricing properties can also adversely affect demand among prospective owner-occupants. Anecdotal evidence indicates the GSEs initially list properties at prices well above comparable homes, even in hard-hit markets. Many homebuyers are either un-

able or unwilling to purchase at these prices, but by the time prices are dropped on unsold properties, they are open to bidding from investors, who are at a competitive advantage due to their ability to pay in cash (Perlberg, 2014). Changes in FHA rules for appraisals and standards for originating insurance policies generated additional barriers for prospective owner-occupants. For instance, FHA began to require random assignment of appraisers to any property transaction in the metropolitan area, but the appraisers were likely to know more about suburban properties and lack understanding of the diversity of neighborhood housing markets in the city. They often further undervalued urban properties even in the context of weak demand. FHA also began to retain middle-man companies to carry out the random assignments and to collect fees for this service; this reduced appraisers' fees and made them less likely to want to appraise city properties (Dewar, Thomas, Deng, & Seymour, 2016). While this policy change was intended to prevent the abuses that led to the foreclosure crisis, it has had the unintended effect of dampening the purchasing power of moderate-income buyers in cities like Detroit.

6.3 The Type and Concentration of REO Buyers

Table 6.1 shows the number of REO sales made to each category of buyer, as well as differences in the share of sales made to each type of buyer between strong neighborhoods and other residential areas in Detroit. Small investors account for 37% of REO sales citywide, making them the largest type of REO buyer during the study period. Individuals acquired a slightly smaller share at 31% of REOs citywide, while large investors acquired 17%, and medium investors acquired 15%. The concentration of buyers in strong neighborhoods is nearly identical to those in other neighborhoods, running somewhat counter to previous studies' findings of greater investor activity in tracts with weaker housing markets (e.g., Immergluck, 2012). Figure 6.1 shows annual changes in the concentration of each type of buyer against the annual number of REO sales. This figure show that investors dominated the market for REO properties during the first half of the study period

when REO inventories grew at a rapid pace. In 2008, when the annual number of REO sales was the largest, investors accounted for 75% of sales. Starting in 2010, however, individuals consistently accounted for roughly 40% of REO sales each year, making them the largest type of buyer, both within and outside of Detroit's strong neighborhoods. While no directly comparable figures exist, investor activity in Detroit appears to consistently dwarf the share of investor acquisitions found in other markets with large REO concentrations, including Fulton County (Atlanta) and Miami-Dade County. Investor activity in Detroit does, however, resemble trends observed in low income block groups in Fulton County (median income less than $30,000), where Immergluck (2012) observed investors as a whole acquired 64% of REOs between January 2008 and April 2009.

Table 6.2 provides information on the share of sales made to each category of buyer by each category of seller. It shows that each of the federal entities sold substantially more properties to individuals in strong neighborhoods than private entities (24%), with HUD selling the largest share among the three federal entities at 51%. Freddie Mac made 39% of its sales to individuals, with Fannie Mae close behind at 37%. HUD and Freddie Mac also made a substantially smaller share of sales to large investors than either Fannie Mae or private entities. Figure 6.2 presents the annual share of REO sales made to each type of buyer by the entity making the sale. This figure shows that each of the federal entities gradually sold a larger share of REOs to individuals and a decreasing share to small investors, with the lines for these two types of buyers crisscrossing at a point near the middle of the study period. Starting in 2009, HUD consistently sold between 48 and 56% of its REOs to individuals. The share of sales made by Fannie to individuals rose above 40% in 2010, the year Fannie Mae experienced its largest single-year number of acquisitions, but gradually fell as a larger share of sales were made to both small and large investors in 2011 and 2012, when Fannie Mae increased its sales volume. Trends in the concentration of buyers for Freddie Mac roughly mirror those for Fannie Mae, but Freddie Mac came to make more than 50% of its annual REO sales to individuals, and it never made much

more than 10% of sales to large investors. Freddie Mac's annual number of acquisitions, however, did not rise in 2010 as it did for Fannie Mae, so Freddie Mac likely experienced less pressure to escalate dispositions to investors. Finally, private entities made sales to each type of buyer at a fairly consistent level across the study period, with a notable bump in the share of sales to large investors in 2008 and 2009.

Table 6.3 presents the concentration of investors and owner-occupants among REO buyers in Detroit and suburban locations. A much larger share of REOs were sold to individuals in suburban locations compared to Detroit's strong neighborhoods. Roughly 52% of REOs were sold to individuals in inner-ring suburbs, while more than 70% were sold to individuals in outer-ring areas. The share of properties sold to investors in the suburbs changed little over the study period, while the share of REOs sold to individuals in Detroit increased after 2008, moving from roughly 25% to nearly 40%—still much lower than the comparable figures for suburban locations. Among REO sales to investors, small investors account for an increasingly large share with distance from the city. In the city of Detroit, where the percentage of investor sales are highest, small investors account for 56% of all such sales. The comparable figures for inner- and outer-ring suburbs are 71% and 86%, respectively.

6.4 REO Sale Prices

REO sale prices fell dramatically after the first few years of the study period, mirroring results from studies of REO sale price trends in Atlanta (Immergluck, 2012) and Cleveland (Coulton et al., 2008). Figure 6.3 shows that the share of REO properties in strong neighborhoods sold for less than $10,000 increased from under one percent in 2005 to 55% in 2008 and 70% in 2009.[1] The rapid increase in the share of properties selling at extremely

[1]As noted elsewhere, REO sales included in the analysis are only for properties for which a document of a completed mortgage foreclosure was recorded starting on January 1, 2005. Other REO sales occurred during the study period for properties with a completed mortgage foreclosure documented prior to 2005. Analysis of Social Compact records flagged as "REO Sales" from 2005 to 2010, regardless of their foreclosure date, shows these records have sales prices consistent with those derived from the post-foreclosure database.

discounted prices is consistent with previous studies showing that as the foreclosure crisis spread in 2008 and financial markets collapsed, owners of REO properties began to empty their inventories at fire-sale prices (Immergluck, 2012). As shown above, REO acquisitions—particularly among private entities—surged in 2007 and 2008. Banks and federal entities have strong incentives to reduce their inventories, so they likely dramatically lowered prices to reduce their exposure to financial risk vis-à-vis REO properties.

Figure 6.4 presents the share of REO sales by price range in strong neighborhoods for the GSEs, HUD, and private entities. The patterns exhibited by each of these sellers broadly reflect the overall trend of a rapid rise in the number of REOs sold at extremely low prices starting in 2008. HUD and private entities, however, sold somewhat larger shares of properties after 2007 for under $10,000 than either of the GSEs. From 2008 to 2012, between 64% and 70% of HUD's sales were priced under $10,000, with the year HUD made far and away its largest number of sales, 2009, exhibiting the largest share of sales below $10,000. This is also the first year HUD made more sales to individuals than investors. Private entities made ever larger shares of sales below $10,000 after 2008, even as inventory and sales plummeted, perhaps reflecting the deteriorated condition of properties lingering in inventory.[2] In terms of the overall share of sales made for less than $10,000 from 2008 to 2013, HUD stands at 66%, private entities at 63%, Fannie at 60%, and Freddie at 44%. Also worth noting from this figure is the share of properties sold by private entities for less than $500. Private entities made between 15% to 20% of sales in this price range starting in 2008, while the share of sales made in this price range by federal entities was marginal. To assist with comparing trends in sale prices among these four sellers, Figure 6.5 shows changes in the median sale price over time in both strong neighborhoods and other neighborhoods. These figures show relatively little separation

I present information only for sales with a document price of at least one dollar. Some properties were donated and fall in $0 category, but this category also includes records for which parties failed to record the sale price, meaning some belong in higher-value categories. Other records were indeed transacted for $0 to investors. Given this uncertainly, I focus on properties with at least a $1 sales amount.

[2]The duration of properties in federal entities is taken up in a later chapter.

among sellers, with the exception of the climbing median sale prices for Freddie Mac from 2009 ($8,050) to 2011 ($15,050). Median sale prices for Freddie Mac fell to the level of other sellers again by 2013. Median sales prices among other sellers were relatively flat after 2008.

Figure 6.6 shows the distribution of REO sale prices in strong neighborhoods for each category of buyer, excluding government and nonprofit entities due to their trivial presence among buyers, and Figure 6.7 compares the median sale prices for these buyers in strong and other neighborhoods. The findings are precisely as expected based on prior research: individuals paid the most for REOs and investors paid less as the overall number of properties they acquired grew. In other words, large investors paid the least, on average, for REOs, while small investors, many likely mom-and-pop operations, paid the most among investors. In 2008 and 2009, when the number of REO sales skyrocketed, nearly half of the purchases made by large investors were at prices below $500. These were also the two years when large investors accounted for their largest share of sales during the study period (see Figure 6.1).

Figure 6.10 shows the median REO sale prices across the three comparison areas, i.e., Detroit's strong neighborhoods and inner- and outer-ring suburbs. Median sale prices in Detroit plummeted between 2005 and 2008, after which they remained flat. Inner-and outer-ring suburban areas also experienced a substantial decline in sale prices through 2009, but both areas saw rebounding sale prices after 2011, particularly in the outer-ring suburbs. REO sale prices in outer-ring locations climbed to 75% of their 2005 peak values, while the comparable figures for inner-ring locations and Detroit's strong neighborhoods are 50% and just 9%, respectively.

6.5 Predicting Sales to Investors

In this section, I discuss the statistical techniques I used for estimating the likelihood of federal and private entities selling REOs to investors and the results of those procedures.

The reason for using regression analysis, in addition to the descriptive analysis of investor acquisitions presented above, is to remove the effects of a given property's character and location in influencing whether or not the property was sold to an investor. As discussed elsewhere in this dissertation, the literature shows that investors are more likely than prospective owner-occupants to purchase lower quality properties and those located in areas with greater disinvestment (Mallach, 2010). Homebuyers principally seek primary residences ready for occupation, while investors in declining areas often look to cheaply add properties to their portfolios of rental properties. Among federal entities is more likely to have smaller and potentially lower-quality properties in its inventory. This is due to the fact FHA-insurance is primarily used for first-time homebuyers, who typically have less wealth than experienced owners seeking loans without FHA insurance. The descriptive statistics show that HUD sold a larger share of REOs to owner-occupants, but this difference could possibly stem from the character and location of these properties rather than from HUD's sales practices. It is with the intention of removing the effects of these other explanatory variables that I use regression analysis. The specific technique I use is logistic regression, which is used for predicting a binary outcome, in this case being the dichotomous outcome of sale either to an investor or an owner-occupant.

6.5.1 Detroit-Only Models

Using the database of post-foreclosure pathways derived from the Social Compact and WCROD data, I fit a series of logistic regression models to test whether federal entities were less likely to sell REOs to investors than private entities and whether annual differences in the likelihood of sales to investors among federal and private entities changed during the study period. Additionally, I tested whether these differences changed based on the type of investor, i.e., whether investors were small, medium, or large, as defined in previous chapters. I restricted the dataset to REOs that entered REO between 2005 and 2012 and were sold out of inventory between 2006 and 2013. Since I only identified REO

sales for properties that entered REO on or after January 1, 2005, the number of REO sales identified in the database for 2005 is small relative to the number of sales identified in subsequent years. The database includes just six REO sales from HUD and eight sales from Freddie Mac in 2005, making data for that year too sparse to include in the model. The dataset was further reduced to just REOs sold to investors and individuals and properties located in a census tract having at least 100 residential parcels (i.e., the same tracts included in the cluster analysis used to define strong and other neighborhoods).

The independent variables of primary interest are dummy variables generated for each combination of federal entity and REO sale year. Each of these variables takes sales by private entities as the reference category. Taking 2006, for example, I included one variable where all properties sold by Fannie Mae are coded 1 and all other observations are coded 0. I repeated this coding scheme for Freddie Mac and HUD, while omitting the generation of a variable for private entities. This scheme for coding sales in 2006 is repeated through 2013. These variables' coefficients represent annual differences between federal and private entities in the log odds of selling to an investor. To account for annual differences, I included dummy variables for each year, taking 2006 as the reference year. To account for seasonal differences in market activity, I also included a series of dummies for each quarter of the year, taking the first quarter (January, February, March) as the reference category. I further fit the model with property characteristics, specifically, floor area, assessed value in the year of foreclosure, and the time between the Sheriff's sale and REO sale in days. I centered these property-level variables on their mean values to aid in interpreting the intercept. Finally, I included census tract fixed effects to control for neighborhood context. The formal specification of this model is as follows:

$$\begin{aligned} \ln\left[\frac{P_{investorpurchase}}{1-P_{investorpurchase}}\right] = {} & b_0 + b_1 \cdot SellerYear_i + b_2 \cdot Year_i + b_3 \cdot Quarter_i \\ & + b_4 \cdot Property_i + b_5 \cdot Days_i + b_6 \cdot Tract_i + e_i \end{aligned} \tag{6.1}$$

Where $P_{\text{investor purchase}}$ is the probability of property *i* being sold to an investor; *SellerYear* is a set of dummy variables indicating sale of property *i* by seller *j* in year *k*, where all sales made by investors in year *k* are coded 0; *Year* is a set of dummy variables for the year in which property *i* was sold; *Property* is a vector of property characteristics; *Quarter* is a set of dummy variables controlling for the quarter in which property *i* was sold; *Days* is a variable controlling for the time in days between Sheriff's sale and REO sale; *Tract* is a series of dummy variables for each census tract controlling for area-invariant neighborhood characteristics, and *e* is the error term.

I regressed the binary outcome of whether or not a property was sold to an investor on the independent variables described in the above paragraph, first using the entire restricted dataset for REO sales in Detroit, then on REO sales in strong neighborhoods alone, and finally on REO sales in other neighborhoods alone. I ran the model with these two subsets of the Detroit database to allow models for strong and other neighborhoods to have different intercepts, reflecting the log odds of a sale to an investor in 2006 by a private entity, and different coefficients for each dummy variable representing an interaction between sale by one of the three federal entities and year. *Property* variables and *Days* are standardized against the grand mean for Detroit properties to facilitate interpretation.

Table 6.4 presents the odds ratios and the standard errors of the raw log odds estimates. Overall, the results show that, all else being equal, federal entities were less likely to sell properties to investors than were private entities, with HUD exhibiting the greatest separation from private entities. The odds ratios for Fannie Mae are significant across all three models starting in 2009, with the exception of 2013 in strong neighborhoods, indicating Fannie Mae were successful in increasing their odds of selling constant-quality housing to owner-occupants in the second half of the study period. The odds ratios for HUD are significant across all models starting in 2008. Fannie Mae and HUD both exhibited the greatest difference from private entities in 2010, the year the national First Look programs were launched (the programs were officially started late 2009). The odds ratio for Fannie

Mae in 2010 is 0.498 and the odds ratio for HUD just 0.238. After 2010, the likelihoods of Fannie, HUD, and private entities selling a given property to an investor exhibit a modest convergence. Freddie Mac exhibited the greatest separation from private entires in strong neighborhoods in 2012; the odds ratio for Freddie Mac in that year is 0.480. Unlike Fannie Mae and HUD, the odds ratios for sales made by Freddie Mac in 2010 are not significant in any of the models. Annual changes in the likelihood of private entities selling a given property to an investor are reflected in the coefficients for the dummy variables indicating the year of sale. Relative to 2006, the results, overall, indicate private entities were more likely to sell properties to investors between 2007 and 2009, when the volume of private entities' REO sales escalated in response to growing inventory. The coefficients are significant and below 1 in 2012 and 2013, meaning private entities were less likely to sell properties to investors in those two years than they were in 2006. Coefficients for property characteristics indicate larger and higher-valued homes were less likely to sell to investors, while homes with longer periods between Sheriff's sale and REO sale were more likely to be sold to investors, conforming to previous findings.

To clarify the presentation of these results, Figure 6.11 shows the predicted probability of sale to an investor based on the coefficients from the citywide and strong neighborhoods only models. More precisely, they show the predicted probability of sale to an investor for a property possessing average values, either citywide or for strong neighborhoods alone, for assessed value, floor area, and days on the market in a census tract having the average owner-occupancy rate. Not surprisingly, these results resemble the rates of sales to investors presented in the chapter showing descriptive statistics derived from the citywide database of post-foreclosure pathways. While many of the coefficients in the model are statistically significant, indicating the consistent presence of a difference between each federal entity and private entities as a whole, the practical differences between federal and private entities are quite modest in some years, particularly among the GSEs. HUD, however, is easily seen to have a much lower predicted probability of sell-

ing a given home to an investor during and after 2008. Based on the citywide model, the percentage point difference between HUD and private entities ranges from nearly 20% in 2008 to more than 30% in 2010. Fannie Mae never differs from private entities by more than 12 percentage points, while Freddie Mac, after several years of minor differences, exhibits am 18 percentage point difference from private entities in 2012. Compared to the predicted probability for properties citywide, the comparable figures derived from the model using observations from strong neighborhoods alone exhibits a lower overall probability of sales to investors, with HUD predicted to sell fewer than 50% of properties to investors from 2008 through 2013. No other entity is predicted to have sold 50% or more of its REO sales in a given year to owner-occupants, with the exception of Freddie Mac, with a predicted probability of selling 48% of its REOs to investors in 2012.

To address the question of whether differences between federal and private entities in terms of likelihood of sale to an investor depend on the size of the investor, I conducted multinomial logistic regression. For the dependent variable, I grouped sales to medium and large investors together due to the sparseness of sales to either large or medium investor by Freddie Mac and HUD in some years. Sales to individuals were coded as 0, sales to small investors coded as 1, and sales to medium and large investors coded as 2. The multinomial regression calculates odds for each of these two levels of investor buyers against the reference category of sales to individuals. As several tracts lacked sales to large and medium investors by Freddie and HUD, I dropped census tract fixed effects from the model and included census tract indicators of housing market strength and spatial expansion terms used in similar studies to reduce spatial autocorrelation (Can, 1997; G. Galster, Temkin, Walker, & Sawyer, 2004; Immergluck & Smith, 2006a). The specific neighborhood indicators included in the model are median home value of owner-occupied housing in 2000, median household income in 1999, poverty rate in 1999, and owner-occupancy rate in 2000. The spatial expansion terms involve adding to the model latitude(y), longitude(x), x^2 , y^2, with x and y having first been normalized. Table 6.5

presents the results of the multinomial model along with the results of a binary logit regressing sale to an investor on the same predictors included in the multinomial model. The formal model is specified as follows:

$$\ln\left[\frac{P_{ij}}{P_{i1}}\right] = b_{0j} + b_{1j} \cdot SellerYear_i + b_{2j} \cdot Year_i + b_{3j} \cdot Quarter_i + b_{4j} \cdot Property_i + b_{5j} \cdot Days_i + b_{6j} \cdot Nbhd_i + e_i + b_{7j} \cdot Space_i + e_i \tag{6.2}$$

Where i is the ith individual, j is the jth category of buyer, $j = 1$ represents a sale to an owner-occupant, *Nbhd* is a vector of tract-level neighborhood attributes, and *Space* represents the spatial terms described above.

Overall, the results of the multinomial model indicate that for federal entities the odds of sale to a medium or large investor rather than an individual as compared to the odds for private entities are much smaller than federal entities' odds of selling a given property to a small investor rather than an individual when compared to private entities. This pattern is most apparent for HUD, for whom odds ratios for sales to medium or large investors fall below 0.20 each year including and after 2008. An exception to this pattern is found in the higher odds ratios for Fannie Mae in 2012 and 2013 in the column comparing sales to medium and large investors with sales to individuals. This finding suggests that the elevated rate of sales to large investors during these years is not explained by differences in the property quality or location of properties sold by Fannie, but rather by Fannie's increase in bulk sales in those years—bulk sales involving properties from both strong and other neighborhoods (see Figure 6.2).[3] Coefficients for property characteristics are similar to those obtained in the initial logit models.

[3]Multinomial regression was also conducted using just sales in strong tracts with results similar to those of the model using the citywide dataset.

6.5.2 Regional Model

To address the question of whether federal and private entities were less likely to sell properties to investors in Detroit's strong neighborhoods than they were in suburban locations, I constructed a logistic regression model for use with my regional post-foreclosure database. The dependent variable remained the binary outcome of a sale to an investor or a sale to an individual. The parameters of primary interest in this model reflect the interaction of seller, year, and, unlike in the Detroit-only model, location, as well as individual dummy variables for each location, reflecting the change in intercept for each of the two suburban locations with reference to Detroit's strong neighborhoods. The formal specification of the model is as follows:

$$\begin{aligned} \ln\left[\frac{P_{investorpurchase}}{1-P_{investorpurchase}}\right] = {} & b_0 + b_1 \cdot SellerYearLocation_i + b_2 \cdot Year_i + b_3 \cdot Quarter_i \\ & + b_4 \cdot Property_i + b_5 \cdot Days_i + b6 \cdot Nbhd_i \\ & + b_7 \cdot County_i + b_8 \cdot Location_i + b_9 \cdot SpatLag_i + e_i \end{aligned} \tag{6.3}$$

Where *SellerYearLocation* is a set of dummy variables indicating sale of property i by seller j in year k and location l, where l takes the levels of Detroit, inner-ring suburb, and outer-ring suburb; *County* is a set of dummy variables indicating the county in which property i is located; *Location* is a set of dummy variables for each of the two suburban locations; and *SpatLag* is the inverse distance-weighted average of arm's length home sale prices occurring within 5,000 feet of and 180 days prior to sale of property i.[4] Because there

[4]Before arriving at the model presented here, I had attempted to fit a model including county subdivision, but this resulted in rank deficiency. This is due to an insufficient number of observations for combination of seller, buyer, year, and county subdivision. As a result, I employed controls for counties. In order to control for spatial context above and beyond what was already accounted for by the census tract indicators of housing market strength, I included the spatial lag of home sales prices, which controls for time-variant neighborhood attributes centered on each REO property through the capitalization of these attributes in adjacent home sale prices. I conducted a likelihood ratio test to compare the fit of models with and without the spatial lag term. The likelihood ratio chi-square is 202.807 and a has a p-value < 0.0001, indicating a highly statistically significant improvement in model fit.

were too few reversions for some categories of sellers in 2005 and 2006, I restricted the dataset to REOs that entered REO between 2006 and 2012 and were sold out of inventory between 2007 and 2013.

Table 6.6 presents the results of the regression analysis. As with the Detroit-only models, the parameter estimates for the federal entity indicators are almost all statistically significant and lower than 1. Thus, regardless of location in the Detroit tri-county area, federal entities were more likely to sell a given property to an owner-occupant than a private entity, all else being equal. The dummy variables for inner- and outer-suburban location are highly significant, with the indicator for sales in inner-ring suburbs having an odds ratio of 0.634 and the indicator for sales in outer-ring suburbs having an odds ratio of 0.438. These results indicate investors are less likely to sell properties to investors at greater distances from Detroit, even after controlling for property characteristics and neighborhood housing market indicators. Because of these locational differences in the odds of a private entity selling a property to an investor, the odds ratios calculated for the federal entities in each of the three locations, i.e., Detroit, inner- and outer-ring suburbs, are not directly comparable. In other words, an odds ratio of 0.382 for Fannie Mae in Detroit in 2010 equates to a different probability of making a sale to an investor than a hypothetically equal odds ratio estimated for either suburban location. In outer-ring suburbs, for instance, an odds ratio larger than 0.383 actually translates to a lower probability of sale to an investor than the lower odds ratio in Detroit due to the inclusion of the term for location.

To illustrate these differences, Figure 6.12 shows the probability of sale to an investor for federal and private entities for an average property in an average neighborhood in each one of the three locations, i.e., Detroit's strong neighborhood and inner- and outer-ring suburbs. Probabilities for both inner- and outer-ring suburbs were calculated for properties located in Oakland County. The predicted probabilities for Detroit's strong neighborhoods are similar to those predicted in the Detroit-only model, with private entities

consistently having an 80% predicted probability of selling a given REO to an investor in each year between 2007 and 2013. The predicted probabilities for the GSEs and HUD are comparable to the results of the Detroit-model in terms of their annual differences from the baseline of sales by private entities. These probabilities, however, are somewhat higher than those produced form the Detroit-only model, as seen in Figure 6.11 Predicted probabilities for the two suburban locations are substantially lower than those for Detroit's strong neighborhoods. Some of this difference is due to the differences between the three locations in terms of average property characteristics and neighborhood conditions, but the parameter estimate for differences between inner- and outer-ring suburbs and Detroit's strong neighborhoods accounts for the majority of the differences in the levels for annual predicted probabilities. As seen in the figure, private entities are far less likely to have sold an area-average REO to an investor in suburban locations. Predicated probabilities in inner-ring suburbs range between 52% and 66%, while they range from just 31% to 44% in outer-ring suburbs. Given these lower baseline predicted probabilities in a given year in suburban locations, comparable odds ratios for federal entities in these locations translate into smaller differences in predicted probabilities relative to private entities. HUD retains a lower predicted probability of selling to an investor than private entities or the GSEs in inner-ring suburbs, with a 19 percentage-point difference from private entities in 2010. In outer-ring neighborhoods, where the gap between private and federal entities is the smallest, the difference between HUD and private entities is just 12 percentage points. In terms of change over time, the probabilities of federal entities selling to investors in the two suburban locations do not exhibit the same decrease in the likelihood of sale to investors exhibited in Detroit during and after 2010. The probability of federal entities selling to investors in Detroit's strong neighborhoods, however, remains high relative to the comparable figures in the suburbs, despite the consistent trend lines observed in these locations.

6.5.3 Discussion of Models Predicting Sale to an Investor

Considered together, the above results provide provisional support for the claim that federal First Look programs launched in late 2009 made a difference in increasing the likelihood of a given property in Detroit being sold to an owner-occupant, particularly for an average property in the city's strong neighborhoods. HUD, in particular, exhibited a sharp decrease in the probability of selling a given property to an investor after 2007, reaching its lowest annual probability of selling to an investor in 2010. What remains to be explained, however, is the reason for the decline in probability of sale to an investor in 2009. Particularly remarkable is the fact that HUD's probability of selling to an investor was lowest, and far lower than the GSEs and private entities, in the same year that it made its single largest annual number of sales, which reached nearly 3,000 in 2010 (see Figure 6.2). Some of this difference from the GSEs may be attributable to the availability of the more affordable and flexible financing offered through FHA than conventional sources. Fannie Mae exhibits a smaller gap between its predicted probability of selling a given property to an investor and the comparable figure for private entities, though the gap for Fannie, too, grew to its largest in 2010. As noted above, Fannie exhibits a modest increase in the probability of selling to an investor after 2010, the same period during which its inventory grew, likely as a result of failed trial modifications. In terms of financing, Fannie Mae only rolled out a financing program intended to be competitive with FHA-financing, the HomeReady mortgage, in 2016. Unlike Fannie Mae and HUD, Freddie Mac did not exhibit a lower probability of selling to an investor than a private entity in 2010, though the gap between Freddie Mac and private entities grew wider than the gap between Fannie Mae and private entities in 2011 and remained wider after.

Compared to Detroit's strong neighborhoods, inner- and outer-ring suburbs exhibit a far lower likelihood of federal and private entities selling area-average properties to investors, with little change in these predicted probabilities over time. These findings are consistent with a similar recent study of REO pathways in metropolitan Chicago (McMil-

lan & Chakraborty, 2016). Much of this difference is explained by the substantially lower activity of medium and large investors in suburban locations, particularly in outer-ring suburbs, where they acquired a combined share of just 4% of REO sales (see Table 6.3). The relative absence of medium and large investors from suburban locations, in turn, is likely explained by many investors' motivation to acquire properties to offer them on the rental market and the economy of scale derived from acquiring rental properties in concentrated areas. Combined with the bulk sales of Detroit homes by federal and private entities alike, large-scale investors had obvious incentives for targeting their activities in central-city Detroit and some its neighboring municipalities. It is precisely in these areas where federal programs intended to provide prospective owner-occupants with the means to compete with investors in the market for mortgage-reverted properties could have the greatest effect. While the results presented here provide modest evidence of such programs' success in making a larger share of REO sales to owner-occupants, the majority of properties were ultimately acquired by investors. The impact of these investors' acquisitions is addressed in the next section.

6.6 Blight Violations and Tax Foreclosure Following Sale

6.6.1 Determination of Tax Foreclosure among Former REOs

Table 6.7 shows the number and percentage of REOs sold by federal and private entities that were later subject to tax foreclosure. This table presents the number and share of properties that were tax-reverted after the REO sale but prior to any subsequent sale, as well as figures for properties that were repossessed for back taxes at any point after the REO sale. As the table shows, REOs sold by private entities were much more likely to experience tax foreclosure than those sold by federal entities. Fully 50% of REOs sold by private entities were eventually repossessed for delinquent property taxes, while the comparable figures for federal entities fell between 27 and 31%. The higher tax-reversion

rate of private entities' former REOs, particularly when looking at tax foreclosures occurring after one or more sales, is largely a function of the larger share of sales they made to investors, many of whom flipped large numbers of properties, often to other investors. The net effect of intra-investor trading of former REOs is the repeated deferral of responsible ownership behavior, as indicated here trough failure to pay property taxes. To illustrate this cycle, Table 6.8 shows the tax-reversion rate among former REOs purchased by each category of buyer. While the tax-reversion rate for large investors is already highest among buyers prior to resale, the share of properties that were purchased out of REO by large investors balloons to nearly 70% when looking at tax-reversion at any point after the initial REO sale. As expected, the incidence of tax foreclosure among REOs purchased by individuals barely changes given individual buyers' search for a primary residence, not a speculative investment vehicle.

While a smaller share of REOs formerly owned by federal entities experienced tax foreclosure, the figures are hardly trivial. More than 20% of REOs formerly owned by federal entities were tax reverted after only one sale, and more than 25% were tax-reverted at a later date regardless of the number of sales after exiting REO.

6.6.2 Determination of Blight among Former REOs

In November 2013, the Blight Removal Task Force (BRTF) began a parcel-by-parcel survey of property conditions in Detroit in order to identify blighted properties and create a list of properties prioritized for demolition. Properties were classified as blighted and placed on the prioritized demolition list if they met one of several criteria. The BRTF summarizes these conditions thusly: "properties that are exposed to the elements, are not structurally sound, are in need of major repairs, are fire damaged, or have essentially been turned into a neighborhood dumping ground, were classified as 'blight' by the Task Force" (Detroit Blight Removal Task Force, 2014). Among Detroit's roughly 380,000 properties, the BRTF identified 40,777 blighted structures and 38,429 further properties with the po-

tential to meet the Task Force's blight criteria in the near future. The BRTF counted all properties owned by the federal entities among the latter group of properties.

Table 6.9 shows the share of former REOs that the BRTF identified as blighted by the REO inventory of origin.[5] Nearly 25% of former REOs owned by private entities at any point during the study period were recommended for immediate removal, in both strong and other neighborhoods, and more than 40% of current and former privately owned REOs were flagged as either blighted or possessing indicators of becoming future blight. Federal entities exhibited lower shares of former REOs classified as blighted, with HUD showing the lowest percentages of properties requiring immediate treatment. As expected, properties entering REO prior to 2009 show a greater likelihood of requiring treatment than properties repossessed after 2009, though the percentages across these two time periods remains quite close for private entities. This suggests improvements in federal disposition practices after the peak of the foreclosure crisis, particularly in terms of sales to individuals, may have led to better outcomes for former REOs. Table 6.10 supports this idea, showing that a far smaller share of former REOs acquired by individuals were flagged as potentially in need of demolition or repair. Fully 60% of former REOs acquired by large investors were flagged as either blighted or possessing indicators of becoming future blight, with more than than 30% flagged for immediate removal, regardless of when these properties entered REO.

6.6.3 Regression Analysis of Tax Foreclosure by Buyer Type

To examine differences in the impacts of selling properties to investors relative to owner-occupants, I fit a logistic regression model regressing the dichotomous outcome of whether or not a given former REO property was subject to tax foreclosure on the type of buyer. As discussed in prior chapters, tax foreclosure is a strong indicator of property disinvestment. Though the descriptive statistics show that investors' acquisitions

[5]This table considers only former REOs as the BRTF classified all current federally owned properties as possessing indicators of future blight.

were subject to tax-reversion at a substantially higher rate than individuals' acquisitions (see Table 6.8), these differences are certainly influenced by property characteristics and neighborhood housing market conditions. I used logistic regression to control for these other factors likely to influence buyers' decisions to allow properties to lapse into tax foreclosure. Since many investors flip their properties, often to other investors, I examine whether properties are subject to tax foreclosure at any point after their initial purchase by an investor, regardless of whether they were sold to other investors. The formal specification of the model is as follows:

$$\ln\left[\frac{P_{taxforeclosure}}{1-P_{taxforeclosure}}\right] = b_0 + b_1 \cdot Buyer_i + b_2 \cdot Year_i + b_3 \cdot Quarter_i + b_4 \cdot Property_i + b_5 \cdot Tract_i + b_6 \cdot SpatLag_i + e_i \tag{6.4}$$

Where *Buyer* is a set of dummy variables indicating whether the property was purchased by a small investor or a medium to large investor, taking purchases by individuals as the reference category. The data supplied to this model are derived from the Detroit-specific database of post-foreclosure pathways for years 2006 through 2012. I include only records through 2012 as three years are required for tax forfeiture to occur.

Table 6.11 presents the results of the logit model. I ran the regression three separate times using (1) all Detroit observations, (2) observations in strong neighborhoods alone, and (3) observations from other residential areas in Detroit. Overall, the results confirm that investors are indeed more likely to allow their REO acquisitions to fall into tax foreclosure than owner-occupants, with medium and large investors being considerably more likely to have properties experience tax foreclosure than either individuals or small investors. In the citywide model, the odds ratio for small investors is 1.626 while the odds ratio for medium and large investors is 3.248. The model restricted to observations from strong neighborhoods alone exhibits smaller coefficients for the investor dummy variables, while the model for other neighborhoods exhibits larger coefficients. The pa-

rameter estimates for the constant term and annual effects, however, are different across the models, making it difficult to directly compare the parameters for the investor dummies. The dummy variables for the year of the REO sale, which take 2006 as the reference category, indicate an increase in the odds of tax foreclosure through 2009, again, relative to 2006, after which the relative odds fall quite steeply. As expected, increased values of the spatial lag term decrease the odds of subsequent tax foreclosure.

To aid in the interpretation of these results, I again present the predicted probabilities generated from the model results. Figure 6.13 presents these predicted probabilities, which were calculated using citywide averages for property characteristics and based on the hypothetical property's location in a tract possessing the average owner-occupancy rate for each area.[6] Overall, the predicted probability for an average property being subsequently subject to tax reversion is incredibly high, regardless of location or buyer type, with investors, as expected, possessing the highest probability of later allowing properties to fall into tax foreclosure. In 2008, the year of peak probability, medium and large investors had an 83% predicted probability of having an acquisition with average characteristics and situated in an average neighborhood later repossessed due to tax delinquency. The comparable figures for small investors and individuals are 71% and 60%, respectively. The 2008 values in strong neighborhoods, now for property with citywide-average housing characteristics, but located in a tract having the average owner-occupancy rate among strong neighborhoods alone, are 76% for medium and large investors, 64% for small investors, and 53% for individuals. The predicted probability for individuals in strong tracts falls below 50% in 2009, while small investors fall below this threshold in 2010, and medium and large investors only do so in 2011.

Having estimated a model including only the main effects of buyer type, i.e., individual versus small investors versus medium and large investors, I subsequently estimated

[6]The model predicts different levels for different tracts, with some having higher odds and some having lower odds of a property going through tax foreclosure, but I chose to present the predicted probabilities for an average tract for illustrative purposes.

a model including interaction terms for the type of buyer and the year of purchase. I hypothesize that the composition of actors within each overall category of buyer might change over time, leading to annual differences among these entities in terms of their relative likelihood of allowing properties to enter tax foreclosure. The formal specification of this model is as follows:

$$\ln\left[\frac{P_{taxforeclosure}}{1-P_{taxforeclosure}}\right] = b_0 + b_1 \cdot BuyerYear_i + b_2 \cdot Year_i + b_3 \cdot Quarter_i + b_4 \cdot Property_i + b_5 \cdot Tract_i + b_6 \cdot SpatLag_i + e_i \tag{6.5}$$

Where *BuyerYear* is a vector of terms indicating sale of property i by buyer type j in year k. This term is analogous to the *SellerYear* term included in the Detroit-only models predicting the odds of sale to an investor. Table 6.12 presents the results of this model. The odds ratios for the terms indicating the interaction of buyer and year exhibit modest variation, the most substantial of which is the difference between the odds ratios for medium and large investors from 2008 to 2009—the odds ratio jumps from 2.622 to 4.054—indicating a higher probability of tax foreclosure in 2009 for medium and large investors than estimated from fixed effects alone. In a plot of the probabilities generated from these interaction terms, this difference among medium and large investors in 2009 is the only clearly noticeable difference, besides the trend lines beginning much closer in 2006. See Figure 6.14.

The extremely high predicted probability of an REO purchased between 2006 and 2009 later being subject to tax foreclosure is explained in part by the bulk acquisition strategies of medium and large investors. Some, if not many of these classes of investors pursued a triage approach to acquiring REOs, whereby they would purchase in large numbers with the understanding only a fraction of them could be quickly flipped for a profit. The rest were intentionally allowed to fall into tax foreclosure. Changes in the lower predicted probability of tax foreclosure over time likely reflect changes in the composition of buyers,

even among large investors, after the earlier wave of predatory finance absorbed large numbers of Detroit properties. Despite these improvements, the predicted rate at which average properties entered tax foreclosure remained unacceptably high. The predicted probability of medium and large investors' 2012 acquisition of an average property still exceeds 25%. The predicted probability for individuals is also particularly high during this time, suggesting that replacing investors with owner-occupants is hardly a panacea for the tax foreclosure problem in Detroit. There are, however, local factors that increase the likelihood of tax foreclosure in Detroit among many types of buyers, particularly the artificially high property tax assessments, which can lead to property tax bills exceeding home values by the end of a three year period, i.e., the number of years between initial tax delinquency and property forfeiture.

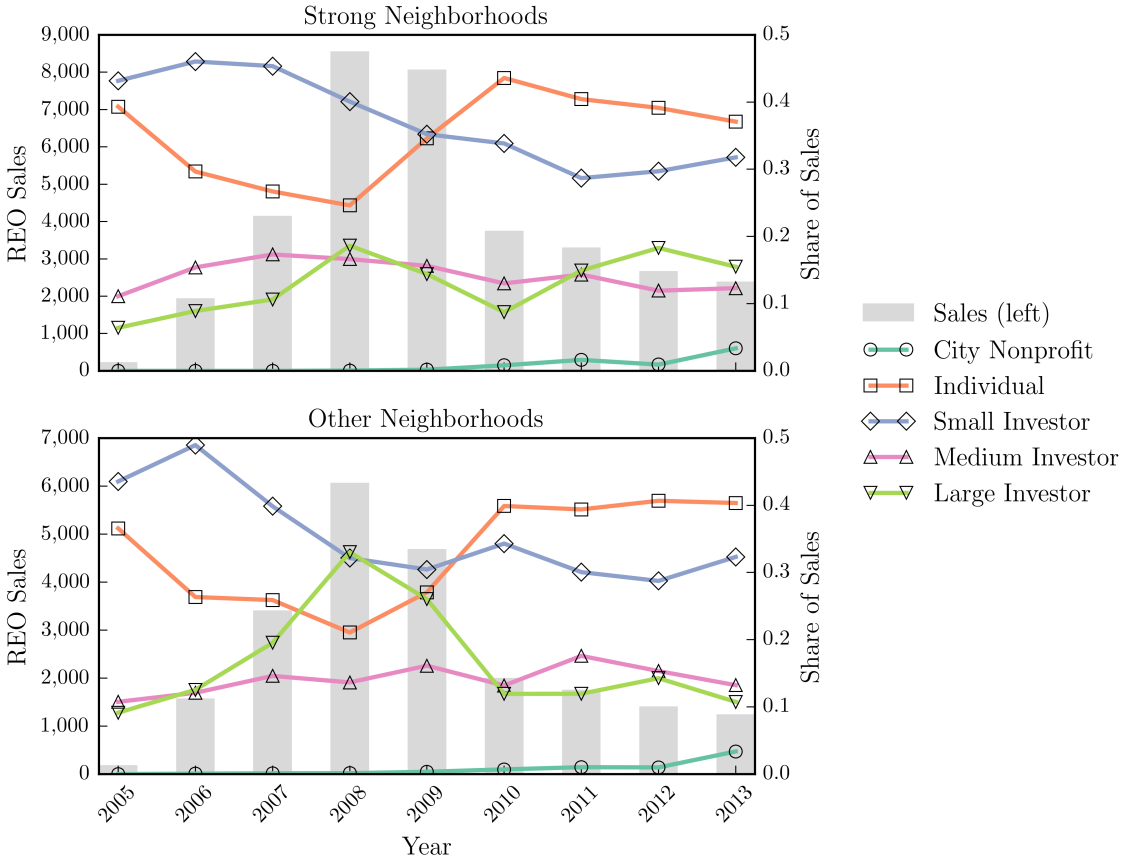

Figure 6.1: REO Sales by Buyer Type in Strong and Other Neighborhoods, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.1: Concentration of REO Buyers in Strong and Other Neighborhoods by Period, 2005–2013

	Strong Neighborhoods		Other Neighborhoods		All Neighborhoods	
	Properties	Share	Properties	Share	Properties	Share
2005–2013						
Individuals	11,020	31.2%	7,198	30.9%	18,218	31.1%
Large Investors	5,702	16.1%	3,983	17.1%	9,685	16.5%
Medium Investors	5,223	14.8%	3,395	14.6%	8,618	14.7%
Small Investors	13,029	36.9%	8,508	36.5%	21,537	36.7%
City and Nonprofits	357	1.0%	230	1.0%	587	1.0%
Total	35,331	100.0%	23,314	100.0%	58,645	100.0%
2005–2008						
Individuals	3,709	23.5%	2,438	23.1%	6,147	23.3%
Large Investors	2,916	18.4%	2,059	19.5%	4,975	18.9%
Medium Investors	2,473	15.6%	1,654	15.6%	4,127	15.6%
Small Investors	6,603	41.8%	4,356	41.2%	10,959	41.5%
City and Nonprofits	107	0.7%	66	0.6%	173	0.7%
Total	15,808	100.0%	10,573	100.0%	26,381	100.0%
2009–2013						
Individuals	6,419	37.2%	4,196	37.3%	10,615	37.2%
Large Investors	2,512	14.6%	1,721	15.3%	4,233	14.8%
Medium Investors	2,495	14.5%	1,551	13.8%	4,046	14.2%
Small Investors	5,654	32.8%	3,680	32.7%	9,334	32.7%
City and Nonprofits	173	1.0%	112	1.0%	285	1.0%
Total	17,253	100.0%	11,260	100.0%	28,513	100.0%

Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.2: Concentration of REO Buyer by Seller and Location, 2005–2013

	Fannie Mae		Freddie Mac		HUD		Private Entities	
	Properties	Share	Properties	Share	Properties	Share	Properties	Share
Strong Neighborhoods								
Individuals	2,464	37.0%	536	38.8%	2,852	51.1%	5,168	23.8%
Large Investors	997	15.0%	96	6.9%	324	5.8%	4,285	19.7%
Medium Investors	796	12.0%	178	12.9%	547	9.8%	3,702	17.0%
Small Investors	2,281	34.3%	559	40.4%	1,835	32.9%	8,354	38.5%
City and Nonprofits	117	1.8%	13	0.9%	21	0.4%	206	0.9%
Total	6,655	100.0%	1,382	100.0%	5,579	100.0%	21,715	100.0%
Other Neighborhoods								
Individuals	1,587	36.0%	346	41.0%	1,872	51.5%	3,393	23.5%
Large Investors	737	16.7%	59	7.0%	207	5.7%	2,980	20.7%
Medium Investors	529	12.0%	104	12.3%	345	9.5%	2,417	16.8%
Small Investors	1,484	33.7%	331	39.3%	1,192	32.8%	5,501	38.1%
City and Nonprofits	73	1.7%	3	0.4%	20	0.6%	134	0.9%
Total	4,410	100.0%	843	100.0%	3,636	100.0%	14,425	100.0%
All Neighborhoods								
Individuals	4,051	36.6%	882	39.6%	4,724	51.3%	8,561	23.7%
Large Investors	1,734	15.7%	155	7.0%	531	5.8%	7,265	20.1%
Medium Investors	1,325	12.0%	282	12.7%	892	9.7%	6,119	16.9%
Small Investors	3,765	34.0%	890	40.0%	3,027	32.8%	13,855	38.3%
City and Nonprofits	190	1.7%	16	0.7%	41	0.4%	340	0.9%
Total	11,065	100.0%	2,225	100.0%	9,215	100.0%	36,140	100.0%

Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

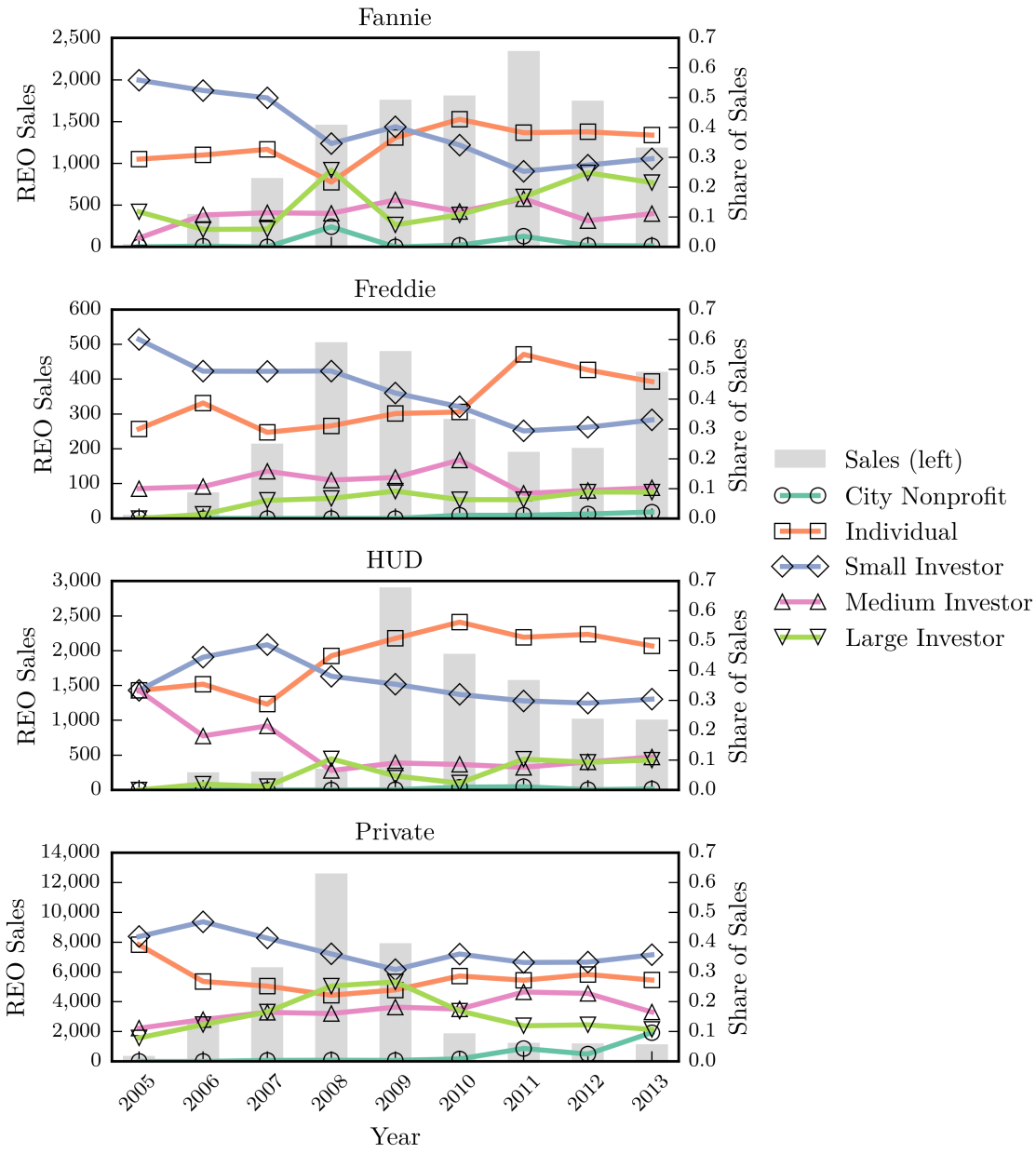

Figure 6.2: REO Sales by Seller and Buyer Type, Detroit 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.3: Concentration of REO Buyers in Strong Neighborhoods, Inner- and Outer-Ring Suburbs by Period, 2005–2013

	Strong Neighborhoods		Inner Ring		Outer Ring	
	Properties	Share	Properties	Share	Properties	Share
2005–2013						
Individuals	10,347	31.7%	32,235	51.6%	32,165	71.5%
Large Investors	4,728	14.5%	2,305	3.7%	451	1.0%
Medium Investors	5,115	15.6%	5,920	9.5%	1,373	3.1%
Small Investors	12,402	37.9%	21,920	35.1%	10,977	24.4%
City and Nonprofits	92	0.3%	44	0.1%	31	0.1%
Total	32,684	100.0%	62,424	100.0%	44,997	100.0%
2005–2008						
Individuals	3,997	24.7%	9,944	51.1%	9,392	73.7%
Large Investors	2,572	15.9%	730	3.8%	207	1.6%
Medium Investors	2,779	17.2%	1,712	8.8%	234	1.8%
Small Investors	6,818	42.1%	7,072	36.3%	2,913	22.9%
City and Nonprofits	10	0.1%	6	0.0%	2	0.0%
Total	16,176	100.0%	19,464	100.0%	12,748	100.0%
2009–2013						
Individuals	6,350	38.5%	22,291	51.9%	22,773	70.6%
Large Investors	2,156	13.1%	1,575	3.7%	244	0.8%
Medium Investors	2,336	14.2%	4,208	9.8%	1,139	3.5%
Small Investors	5,584	33.8%	14,848	34.6%	8,064	25.0%
City and Nonprofits	82	0.5%	38	0.1%	29	0.1%
Total	16,508	100.0%	42,960	100.0%	32,249	100.0%

Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Figure 6.3: Share of REO Sales by Price Range in Strong and Other Neighborhoods, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Figure 6.4: Share of REO Sales by Seller and Price Range in Strong Neighborhoods, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

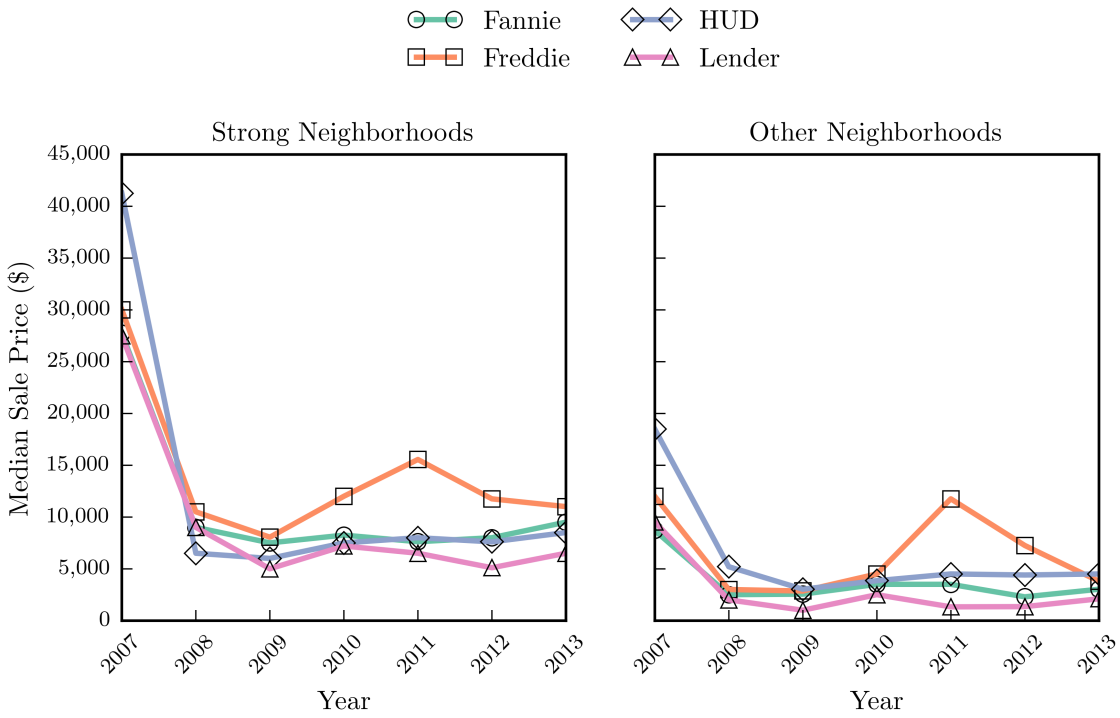

Figure 6.5: Median REO Sale Price by Seller in Strong and Other Neighborhoods, Detroit 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.4: Odds Ratios for Logistic Regression for Investor Purchase on REO Inventory of Origin

	Dependent variable:		
	Investor purchase		
	All	Strong	Other
	(1)	(2)	(3)
TR_FANNIE2006	0.786* (0.129)	0.786 (0.176)	0.778 (0.189)
TR_FANNIE2007	0.805** (0.092)	0.916 (0.128)	0.706*** (0.133)
TR_FANNIE2008	0.964 (0.074)	1.004 (0.098)	0.919 (0.114)
TR_FANNIE2009	0.532*** (0.062)	0.568*** (0.077)	0.480*** (0.102)
TR_FANNIE2010	0.517*** (0.075)	0.498*** (0.095)	0.549*** (0.123)
TR_FANNIE2011	0.599*** (0.082)	0.591*** (0.104)	0.617*** (0.133)
TR_FANNIE2012	0.671*** (0.086)	0.686*** (0.110)	0.647*** (0.138)
TR_FANNIE2013	0.752*** (0.104)	0.800 (0.137)	0.681** (0.163)
TR_FREDDIE2006	0.511** (0.279)	0.372*** (0.375)	0.767 (0.437)
TR_FREDDIE2007	0.772 (0.178)	0.802 (0.223)	0.715 (0.296)
TR_FREDDIE2008	0.705*** (0.109)	0.747** (0.141)	0.651** (0.171)
TR_FREDDIE2009	0.594*** (0.110)	0.636*** (0.131)	0.526*** (0.206)
TR_FREDDIE2010	0.917 (0.156)	0.828 (0.178)	1.367 (0.341)

TR_FREDDIE2011	0.533*** (0.194)	0.562*** (0.217)	0.489 (0.456)
TR_FREDDIE2012	0.428*** (0.180)	0.480*** (0.206)	0.247*** (0.404)
TR_FREDDIE2013	0.541*** (0.140)	0.507*** (0.173)	0.562** (0.244)
TR_HUD2006	0.624*** (0.144)	0.710** (0.174)	0.440*** (0.268)
TR_HUD2007	0.899 (0.159)	1.081 (0.198)	0.644 (0.268)
TR_HUD2008	0.328*** (0.124)	0.290*** (0.141)	0.551** (0.269)
TR_HUD2009	0.281*** (0.050)	0.314*** (0.062)	0.237*** (0.089)
TR_HUD2010	0.232*** (0.074)	0.230*** (0.091)	0.244*** (0.127)
TR_HUD2011	0.305*** (0.087)	0.340*** (0.108)	0.241*** (0.150)
TR_HUD2012	0.329*** (0.096)	0.336*** (0.118)	0.304*** (0.165)
TR_HUD2013	0.385*** (0.105)	0.372*** (0.132)	0.382*** (0.178)
reo_sale_year2007	1.235*** (0.055)	1.222*** (0.075)	1.245*** (0.080)
reo_sale_year2008	1.373*** (0.050)	1.366*** (0.069)	1.369*** (0.074)
reo_sale_year2009	1.159*** (0.053)	1.072 (0.072)	1.306*** (0.081)
reo_sale_year2010	0.915 (0.070)	0.896 (0.092)	0.938 (0.112)
reo_sale_year2011	0.903 (0.081)	0.896 (0.106)	0.908 (0.128)
reo_sale_year2012	0.800*** (0.081)	0.850 (0.107)	0.723** (0.127)
reo_sale_year2013	0.777*** (0.091)	0.895 (0.121)	0.632*** (0.139)
quarter1	0.878*** (0.027)	0.912*** (0.035)	0.833*** (0.044)
quarter2	0.917*** (0.029)	0.968 (0.037)	0.843*** (0.047)
quarter3	0.937** (0.030)	0.970 (0.038)	0.894** (0.049)
floor_area_ln_cgm	0.806*** (0.035)	0.679*** (0.051)	0.945 (0.050)
assessed_val_ln_cgm	0.880*** (0.022)	0.922*** (0.027)	0.812*** (0.038)
timedelta_cgm	1.000*** (0.00004)	1.000*** (0.0001)	1.001*** (0.0001)
Constant	3.310*** (0.106)	3.004*** (0.116)	6.851*** (0.223)
Observations	53,521	32,116	21,405
Log Likelihood	−30,343.340	−18,601.880	−11,687.970
Chi-square versus null model	4,882.935***	2,761.696***	2,173.942***
Akaike Inf. Crit.	61,334.680	37,483.760	23,817.940

*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.5: Odds Ratios for Multinomial Logistic Regression for Investor Type on REO Inventory of Origin

	Logistic	*Multinomial log-linear*	
	All investors	Small investors	Medium and Large Investors
	(1)	(2)	(3)

TR_FANNIE2006	0.776** (0.127)	0.894 (0.133)	0.565*** (0.172)
TR_FANNIE2007	0.788*** (0.091)	0.991 (0.095)	0.507*** (0.116)
TR_FANNIE2008	0.938 (0.073)	0.980 (0.081)	0.892 (0.081)
TR_FANNIE2009	0.529*** (0.061)	0.835*** (0.067)	0.307*** (0.077)
TR_FANNIE2010	0.511*** (0.074)	0.578*** (0.083)	0.433*** (0.091)
TR_FANNIE2011	0.603*** (0.081)	0.516*** (0.094)	0.697*** (0.093)
TR_FANNIE2012	0.670*** (0.085)	0.575*** (0.099)	0.772*** (0.097)
TR_FANNIE2013	0.753*** (0.103)	0.634*** (0.116)	0.927 (0.122)
TR_FREDDIE2006	0.510** (0.277)	0.542** (0.300)	0.450** (0.385)
TR_FREDDIE2007	0.772 (0.176)	0.861 (0.188)	0.643** (0.215)
TR_FREDDIE2008	0.674*** (0.107)	0.990 (0.113)	0.363*** (0.140)
TR_FREDDIE2009	0.582*** (0.109)	0.874 (0.119)	0.364*** (0.138)
TR_FREDDIE2010	0.878 (0.154)	0.909 (0.170)	0.839 (0.186)
TR_FREDDIE2011	0.501*** (0.191)	0.616** (0.210)	0.354*** (0.271)
TR_FREDDIE2012	0.419*** (0.177)	0.482*** (0.204)	0.349*** (0.237)
TR_FREDDIE2013	0.560*** (0.138)	0.605*** (0.154)	0.490*** (0.181)
TR_HUD2006	0.627*** (0.142)	0.639*** (0.154)	0.608*** (0.185)
TR_HUD2007	0.870 (0.157)	0.995 (0.165)	0.685** (0.190)
TR_HUD2008	0.309*** (0.122)	0.471*** (0.133)	0.168*** (0.170)
TR_HUD2009	0.281*** (0.050)	0.502*** (0.055)	0.127*** (0.067)
TR_HUD2010	0.230*** (0.073)	0.316*** (0.080)	0.134*** (0.100)
TR_HUD2011	0.307*** (0.086)	0.372*** (0.098)	0.241*** (0.106)
TR_HUD2012	0.329*** (0.095)	0.410*** (0.108)	0.246*** (0.119)
TR_HUD2013	0.390*** (0.104)	0.407*** (0.116)	0.371*** (0.129)
reo_sale_year2007	1.239*** (0.054)	1.079 (0.058)	1.558*** (0.065)
reo_sale_year2008	1.373*** (0.050)	0.998 (0.053)	2.126*** (0.060)
reo_sale_year2009	1.156*** (0.053)	0.712*** (0.057)	2.076*** (0.063)
reo_sale_year2010	0.915 (0.070)	0.730*** (0.076)	1.282*** (0.082)
reo_sale_year2011	0.890 (0.080)	0.672*** (0.089)	1.329*** (0.094)
reo_sale_year2012	0.802*** (0.080)	0.606*** (0.090)	1.194* (0.094)
reo_sale_year2013	0.764*** (0.090)	0.664*** (0.098)	0.958 (0.108)
quarter1	0.880*** (0.027)	0.909*** (0.030)	0.842*** (0.032)
quarter2	0.920*** (0.029)	0.863*** (0.032)	0.995 (0.033)
quarter3	0.938** (0.030)	0.852*** (0.033)	1.059* (0.034)
floor_area_ln_zgm	0.929*** (0.012)	0.950*** (0.014)	0.901*** (0.014)
assessed_val_ln_zgm	0.927*** (0.012)	0.956*** (0.013)	0.895*** (0.014)
timedelta_zgm	1.103*** (0.011)	1.080*** (0.012)	1.130*** (0.013)
X_norm	0.925 (0.049)	0.870** (0.055)	1.001 (0.058)
Y_norm	2.085*** (0.082)	2.055*** (0.090)	2.106*** (0.095)
lat.2	0.252*** (0.247)	0.441*** (0.273)	0.115*** (0.307)
long.2	1.796*** (0.186)	1.628** (0.205)	2.071*** (0.219)
latXlong	4.604*** (0.309)	2.304** (0.343)	12.106*** (0.363)
med_hm_val_zgm	0.915*** (0.021)	0.940*** (0.023)	0.878*** (0.025)
med_hh_inc_zgm	1.027 (0.028)	1.009 (0.030)	1.038 (0.033)
pov_rate_zgm	0.954** (0.020)	0.914*** (0.022)	0.995 (0.023)

own_occ_zgm	0.886*** (0.021)	0.916*** (0.023)	0.851*** (0.024)
Constant	3.106*** (0.052)	2.126*** (0.056)	0.986 (0.063)
Observations	53,521	53,521	
Log Likelihood	−30,770.650	−33,423.5	
Chi-square versus null model	4,028.306***	6,019.885***	
Akaike Inf. Crit.	61,635.310	111,347.600	111,347.600
			*p<0.1; **p<0.05; ***p<0.01

Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.6: Odds Ratios for Logistic Regression for Investor Type on Inventory of Origin, Regional Model

	Dependent variable:
	buyer_cat
TR_FANNIE_det2007	1.023 (0.128)
TR_FANNIE_det2008	1.154 (0.093)
TR_FANNIE_det2009	0.557*** (0.073)
TR_FANNIE_det2010	0.390*** (0.069)
TR_FANNIE_det2011	0.443*** (0.067)
TR_FANNIE_det2012	0.418*** (0.072)
TR_FANNIE_det2013	0.427*** (0.101)
TR_FANNIE_inner2007	0.684*** (0.083)
TR_FANNIE_inner2009	0.749*** (0.048)
TR_FANNIE_inner2010	0.628*** (0.046)
TR_FANNIE_inner2011	0.662*** (0.046)
TR_FANNIE_inner2012	0.607*** (0.047)
TR_FANNIE_inner2013	0.542*** (0.065)
TR_FANNIE_outer2007	0.515*** (0.115)
TR_FANNIE_outer2008	0.552*** (0.079)
TR_FANNIE_outer2009	0.670*** (0.060)
TR_FANNIE_outer2010	0.580*** (0.057)
TR_FANNIE_outer2011	0.586*** (0.054)
TR_FANNIE_outer2012	0.537*** (0.056)
TR_FANNIE_outer2013	0.414*** (0.078)
TR_FREDDIE_det2007	1.122 (0.223)
TR_FREDDIE_det2008	0.757** (0.134)
TR_FREDDIE_det2009	0.567*** (0.127)
TR_FREDDIE_det2010	0.549*** (0.157)
TR_FREDDIE_det2011	0.391*** (0.196)
TR_FREDDIE_det2012	0.250*** (0.168)

TR_FREDDIE_det2013	0.368*** (0.147)
TR_FREDDIE_inner2007	0.806* (0.119)
TR_FREDDIE_inner2008	0.829** (0.081)
TR_FREDDIE_inner2009	0.722*** (0.070)
TR_FREDDIE_inner2010	0.715*** (0.060)
TR_FREDDIE_inner2011	0.492*** (0.061)
TR_FREDDIE_inner2012	0.536*** (0.061)
TR_FREDDIE_inner2013	0.524*** (0.082)
TR_FREDDIE_outer2007	0.568*** (0.152)
TR_FREDDIE_outer2008	0.612*** (0.097)
TR_FREDDIE_outer2009	0.668*** (0.081)
TR_FREDDIE_outer2010	0.671*** (0.068)
TR_FREDDIE_outer2011	0.509*** (0.071)
TR_FREDDIE_outer2012	0.464*** (0.072)
TR_FREDDIE_outer2013	0.398*** (0.096)
TR_HUD_det2007	0.672 (0.392)
TR_HUD_det2008	0.422*** (0.141)
TR_HUD_det2009	0.285*** (0.055)
TR_HUD_det2010	0.182*** (0.069)
TR_HUD_det2011	0.240*** (0.074)
TR_HUD_det2012	0.233*** (0.081)
TR_HUD_det2013	0.203*** (0.091)
TR_HUD_inner2007	0.657*** (0.134)
TR_HUD_inner2008	0.728*** (0.079)
TR_HUD_inner2009	0.629*** (0.045)
TR_HUD_inner2010	0.450*** (0.057)
TR_HUD_inner2011	0.460*** (0.059)
TR_HUD_inner2012	0.409*** (0.057)
TR_HUD_inner2013	0.401*** (0.067)
TR_HUD_outer2007	0.808 (0.208)
TR_HUD_outer2008	0.495*** (0.145)
TR_HUD_outer2009	0.620*** (0.087)
TR_HUD_outer2010	0.532*** (0.099)
TR_HUD_outer2011	0.619*** (0.100)
TR_HUD_outer2012	0.595*** (0.086)
TR_HUD_outer2013	0.433*** (0.097)
new_clust1	0.634*** (0.027)
new_clust2	0.438*** (0.033)
reo_sale_year2008	0.951* (0.029)
reo_sale_year2009	0.918*** (0.032)
reo_sale_year2010	1.049 (0.036)
reo_sale_year2011	1.054 (0.039)
reo_sale_year2012	1.237*** (0.038)
reo_sale_year2013	1.541*** (0.047)
quarter1	0.933*** (0.016)

quarter2	0.917*** (0.017)
quarter3	0.959** (0.017)
floor_area_ln_zgm	0.849*** (0.009)
assessed_val_ln_zgm	0.755*** (0.012)
timedelta_zgm	1.032*** (0.007)
spat_lag5k_ln_zgm	0.848*** (0.012)
med_hm_val_zgm	0.971* (0.017)
med_hh_inc_zgm	1.055*** (0.020)
own_occ_zgm	0.995 (0.008)
pov_rate_zgm	1.079*** (0.010)
county_cat1	0.896*** (0.017)
county_cat2	0.979 (0.017)
Constant	1.927*** (0.033)
Observations	133,309
Log Likelihood	−82,697.460
Chi-square versus null model	18,611.340***
Akaike Inf. Crit.	165,564.900
	*p<0.1; **p<0.05; ***p<0.01

Sources: RealtyTrac (2015b), U.S. Bureau of the Census (2000).

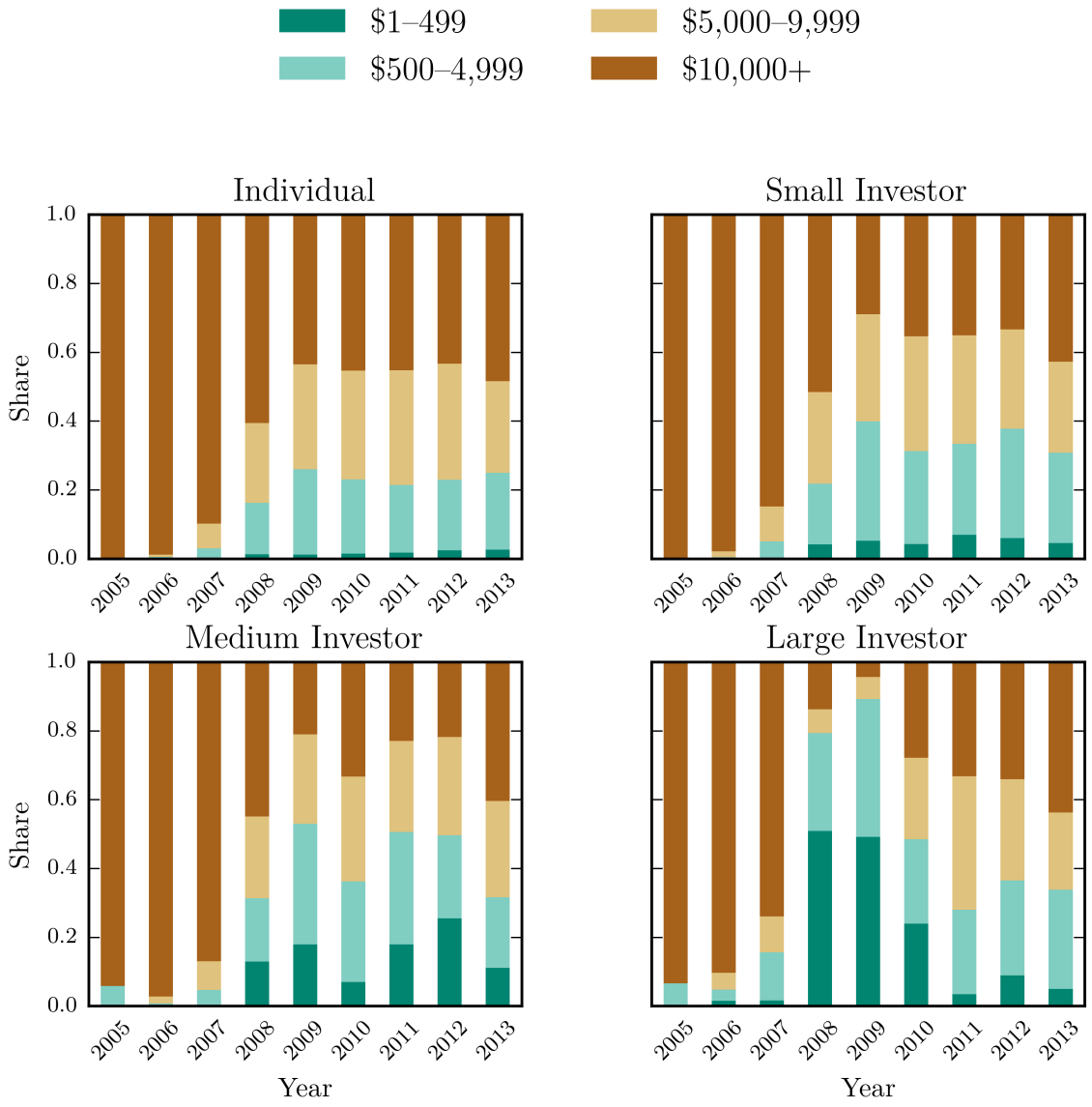

Figure 6.6: Share of REO Sales by Buyer and Price Range in Strong Neighborhoods, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.7: Tax Foreclosures by REO Inventory of Origin, 2008–2015

	Strong Neighborhoods		Other Neighborhoods		Total	
	Properties	Share	Properties	Share	Properties	Share
After One Sale						
Fannie Mae	1,454	21.8%	1,041	23.6%	2,495	22.5%
Freddie Mac	300	21.7%	166	19.7%	466	20.9%
HUD	1,269	22.7%	889	24.4%	2,158	23.4%
Private Entities	7,315	33.7%	5,034	34.9%	12,349	34.2%
After One or More Sales						
Fannie Mae	2,000	30.1%	1,420	32.2%	3,420	30.9%
Freddie Mac	375	27.1%	208	24.7%	583	26.2%
HUD	1,504	27.0%	1,039	28.6%	2,543	27.6%
Private Entities	10,802	49.7%	7,466	51.8%	18,268	50.5%

Sources: CoreLogic (2010), Loveland Technologies (2015), Wayne County Register of Deeds (2014).

Table 6.8: Tax Foreclosures by REO Buyer Type, 2008–2015

	Strong Neighborhoods		Other Neighborhoods		Total	
	Properties	Share	Properties	Share	Properties	Share
Prior to Second Sale						
Individuals	2,483	22.5%	1,696	23.6%	4,179	22.9%
Large Investors	1,982	34.8%	1,421	35.7%	3,403	35.1%
Medium Investors	1,706	32.7%	1,134	33.4%	2,840	33.0%
Small Investors	4,110	31.5%	2,834	33.3%	6,944	32.2%
City and Nonprofits	56	15.7%	44	19.1%	100	17.0%
Anytime after Purchase						
Individuals	2,829	25.7%	1,916	26.6%	4,745	26.1%
Large Investors	3,845	67.4%	2,713	68.1%	6,558	67.7%
Medium Investors	2,659	50.9%	1,831	53.9%	4,490	52.1%
Small Investors	5,282	40.5%	3,619	42.5%	8,901	41.3%
City and Nonprofits	65	18.2%	52	22.6%	117	19.9%

Sources: CoreLogic (2010), Loveland Technologies (2015), Wayne County Register of Deeds (2014).

Table 6.9: Determination of Blight among Former REOs by Inventory of Origin

	Strong Neighborhoods			Other Neighborhoods		
	Demolition Recommended	Blight Indicators	Either	Demolition Recommended	Blight Indicators	Either
Reverted 2005–2013						
Fannie Mae	17.2%	19.6%	36.8%	18.1%	20.7%	38.8%
Freddie Mac	13.7%	30.2%	43.9%	12.3%	29.9%	42.2%
HUD	12.1%	14.6%	26.8%	12.7%	14.9%	27.5%
Private Entities	23.4%	21.4%	44.8%	24.8%	21.3%	46.1%
Reverted 2005–2008						
Fannie Mae	25.5%	19.9%	45.4%	25.0%	19.2%	44.1%
Freddie Mac	18.1%	23.6%	41.7%	20.3%	20.6%	40.9%
HUD	16.9%	20.7%	37.6%	18.0%	21.5%	39.4%
Private Entities	24.6%	21.4%	46.1%	26.6%	21.4%	48.0%
Reverted 2009–2013						
Fannie Mae	14.7%	19.5%	34.3%	16.1%	21.2%	37.3%
Freddie Mac	11.5%	33.5%	45.0%	8.4%	34.5%	42.9%
HUD	11.6%	14.0%	25.7%	12.2%	14.3%	26.5%
Private Entities	21.6%	21.2%	42.8%	21.9%	21.1%	43.0%

Sources: City of Detroit (2016), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.10: Determination of Blight among Former REOs by Buyer Type

	Strong Neighborhoods			Other Neighborhoods		
	Demolition Recommended	Blight Indicators	Either	Demolition Recommended	Blight Indicators	Either
Reverted 2005–2013						
Individuals	11.1%	16.4%	27.4%	11.6%	16.8%	28.4%
Large Investors	36.2%	23.9%	60.0%	36.8%	23.7%	60.5%
Medium Investors	26.1%	21.6%	47.6%	26.6%	23.1%	49.7%
Small Investors	18.2%	21.5%	39.7%	19.8%	21.3%	41.1%
Reverted 2005–2008						
Individuals	15.7%	18.7%	34.4%	16.3%	18.7%	35.0%
Large Investors	40.5%	21.3%	61.8%	43.1%	20.5%	63.6%
Medium Investors	26.1%	22.3%	48.4%	27.1%	22.9%	50.0%
Small Investors	20.9%	22.6%	43.4%	22.9%	22.4%	45.3%
Reverted 2009–2013						
Individuals	8.7%	15.1%	23.8%	9.2%	15.9%	25.0%
Large Investors	31.7%	26.5%	58.2%	30.1%	27.1%	57.2%
Medium Investors	26.0%	21.0%	47.0%	26.1%	23.3%	49.4%
Small Investors	15.5%	20.4%	35.8%	16.6%	20.1%	36.7%

Sources: City of Detroit (2016), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 6.11: Odds Ratios for Logistic Regression for Subsequent Tax Foreclosure on Buyer Type

	Dependent variable:		
	Tax foreclosure		
	All	Strong	Other
	(1)	(2)	(3)
buyer_mlevel1	1.626*** (0.027)	1.547*** (0.033)	1.759*** (0.045)
buyer_mlevel2	3.248*** (0.028)	2.851*** (0.035)	4.138*** (0.048)
reo_sale_year2007	1.609*** (0.050)	1.610*** (0.065)	1.588*** (0.077)
reo_sale_year2008	1.655*** (0.054)	1.489*** (0.072)	1.829*** (0.084)
reo_sale_year2009	1.185** (0.076)	0.961 (0.102)	1.433*** (0.116)
reo_sale_year2010	0.659*** (0.086)	0.513*** (0.116)	0.830 (0.131)
reo_sale_year2011	0.379*** (0.090)	0.286*** (0.123)	0.501*** (0.135)
reo_sale_year2012	0.217*** (0.094)	0.154*** (0.131)	0.309*** (0.137)
quarter1	0.904*** (0.030)	0.880*** (0.037)	0.940 (0.051)
quarter2	0.797*** (0.032)	0.772*** (0.039)	0.831*** (0.054)
quarter3	0.766*** (0.034)	0.713*** (0.042)	0.848*** (0.057)
floor_area_ln_zgm	0.882*** (0.015)	0.829*** (0.021)	0.944** (0.022)
assessed_val_ln_zgm	0.857*** (0.013)	0.856*** (0.016)	0.866*** (0.024)
timedelta_zgm	1.175*** (0.011)	1.158*** (0.013)	1.203*** (0.019)
spat_lag5k_ln_zgm	0.822*** (0.028)	0.733*** (0.040)	0.921** (0.040)
Constant	0.393*** (0.118)	0.473*** (0.132)	1.925*** (0.232)
Observations	46,182	30,210	15,972
Log Likelihood	−26,198.510	−17,206.990	−8,946.714
Chi-square versus null model	11,468.52***	5,827.268***	3,066.45***
Akaike Inf. Crit.	52,895.020	34,649.980	18,185.430

*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: CoreLogic (2010), Loveland Technologies (2015), Wayne County Register of Deeds (2014).

Table 6.12: Odds Ratios for Logistic Regression for Subsequent Tax Foreclosure on Buyer Type including Interaction Terms

	Dependent variable:		
	Tax foreclosure		
	All	Strong	Other
	(1)	(2)	(3)
TR_small2006	1.274** (0.098)	1.297** (0.131)	1.297** (0.131)
TR_small2007	1.359*** (0.070)	1.265*** (0.089)	1.265*** (0.089)
TR_small2008	1.416*** (0.052)	1.442*** (0.065)	1.442*** (0.065)
TR_small2009	1.788*** (0.052)	1.623*** (0.062)	1.623*** (0.062)
TR_small2010	1.824*** (0.075)	1.645*** (0.092)	1.645*** (0.092)
TR_small2011	1.888*** (0.094)	1.592*** (0.119)	1.592*** (0.119)
TR_small2012	2.128*** (0.121)	2.110*** (0.164)	2.110*** (0.164)
TR_large2006	1.232* (0.112)	1.152 (0.151)	1.152 (0.151)
TR_large2007	2.070*** (0.076)	1.757*** (0.096)	1.757*** (0.096)
TR_large2008	3.202*** (0.054)	2.622*** (0.067)	2.622*** (0.067)
TR_large2009	4.651*** (0.055)	4.054*** (0.066)	4.054*** (0.066)
TR_large2010	3.463*** (0.084)	3.144*** (0.102)	3.144*** (0.102)
TR_large2011	3.522*** (0.091)	3.087*** (0.112)	3.087*** (0.112)
TR_large2012	3.663*** (0.116)	3.777*** (0.155)	3.777*** (0.155)
reo_sale_year2007	1.387*** (0.099)	1.479*** (0.130)	1.479*** (0.130)
reo_sale_year2008	1.216** (0.095)	1.135 (0.126)	1.135 (0.126)
reo_sale_year2009	0.706*** (0.107)	0.609*** (0.143)	0.609*** (0.143)
reo_sale_year2010	0.429*** (0.117)	0.351*** (0.156)	0.351*** (0.156)
reo_sale_year2011	0.242*** (0.126)	0.197*** (0.169)	0.197*** (0.169)
reo_sale_year2012	0.131*** (0.140)	0.089*** (0.194)	0.089*** (0.194)
quarter1	0.910*** (0.030)	0.884*** (0.037)	0.884*** (0.037)
quarter2	0.804*** (0.032)	0.779*** (0.039)	0.779*** (0.039)
quarter3	0.778*** (0.034)	0.725*** (0.042)	0.725*** (0.042)
floor_area_ln_zgm	0.880*** (0.015)	0.828*** (0.021)	0.828*** (0.021)
assessed_val_ln_zgm	0.856*** (0.013)	0.854*** (0.016)	0.854*** (0.016)
timedelta_zgm	1.172*** (0.011)	1.156*** (0.014)	1.156*** (0.014)
spat_lag5k_ln_zgm	0.822*** (0.028)	0.732*** (0.040)	0.732*** (0.040)
Constant	0.569*** (0.135)	0.660*** (0.159)	0.660*** (0.159)
Observations	46,182	30,210	30,210
Log Likelihood	−26,104.530	−17,150.710	−17,150.710
Chi-square versus null model	11,656.48***	5,828.268***	3,066.45***
Akaike Inf. Crit.	52,731.050	34,561.410	34,561.410

*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: CoreLogic (2010), Loveland Technologies (2015), Wayne County Register of Deeds (2014).

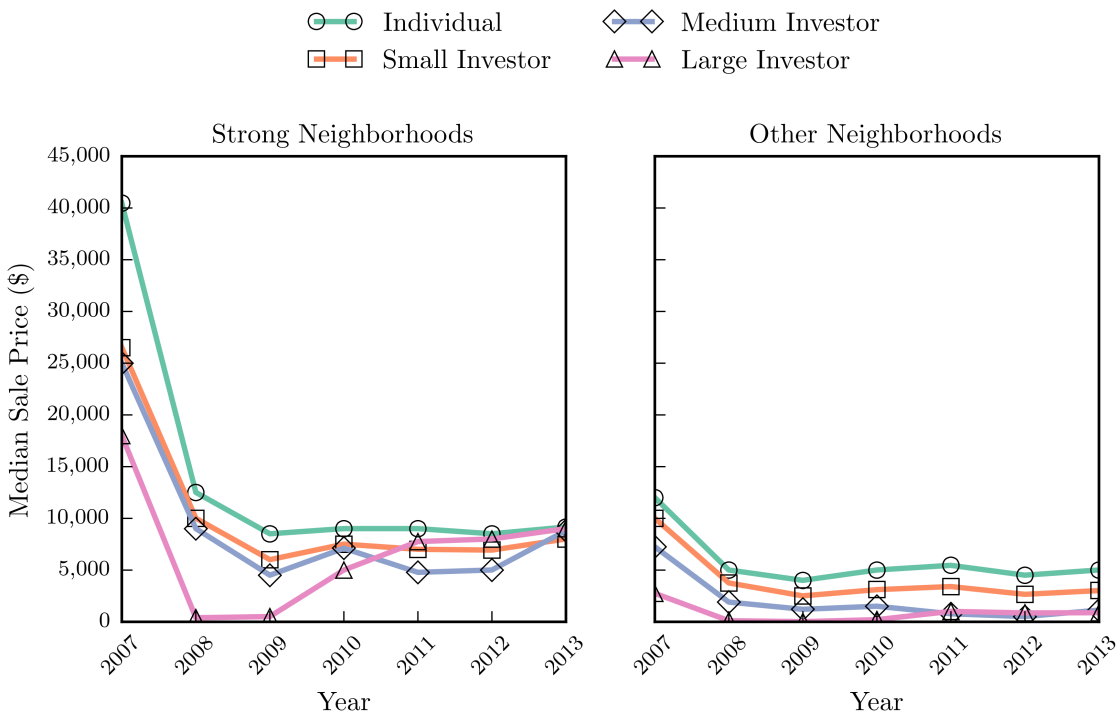

Figure 6.7: Median REO Sale Price by Buyer in Strong and Other Neighborhoods, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

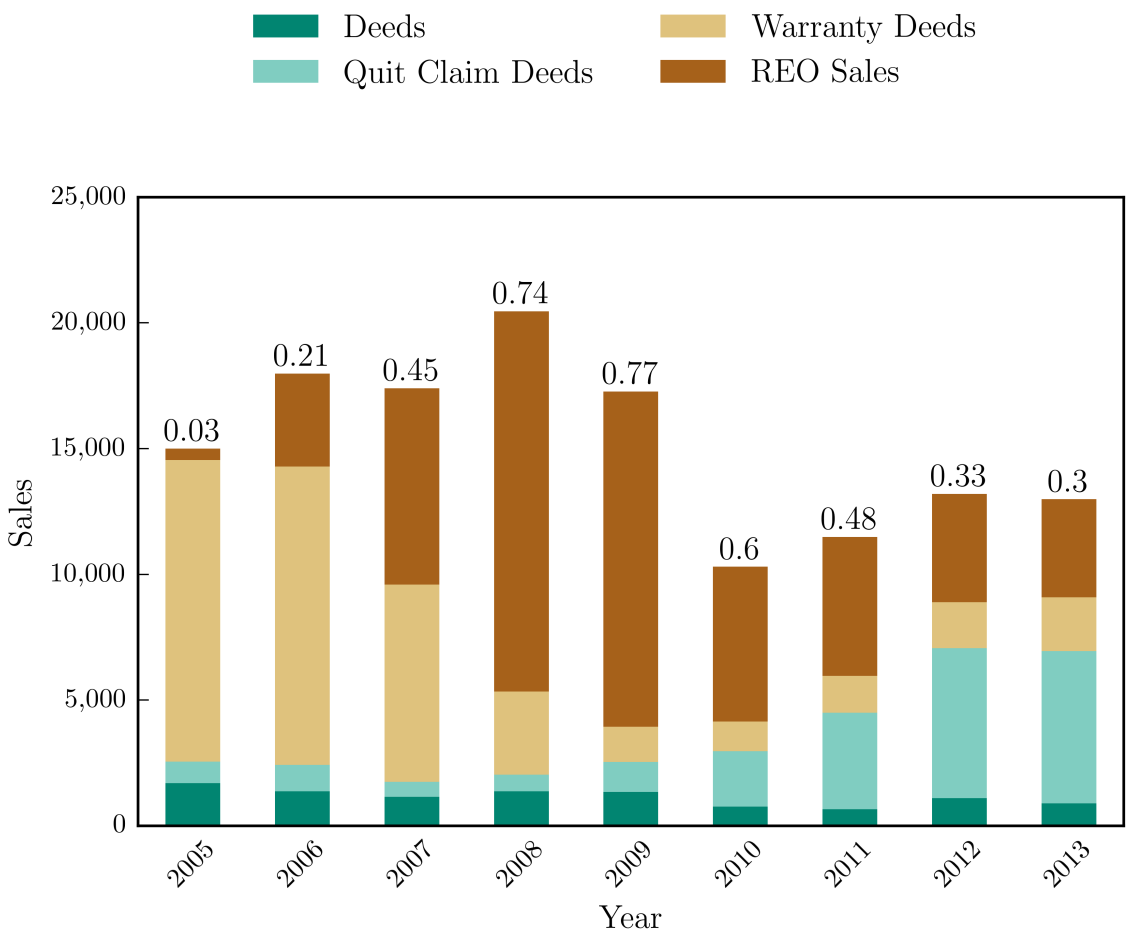

Figure 6.8: REO Sales as Share of All Detroit Real Estate Transactions, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

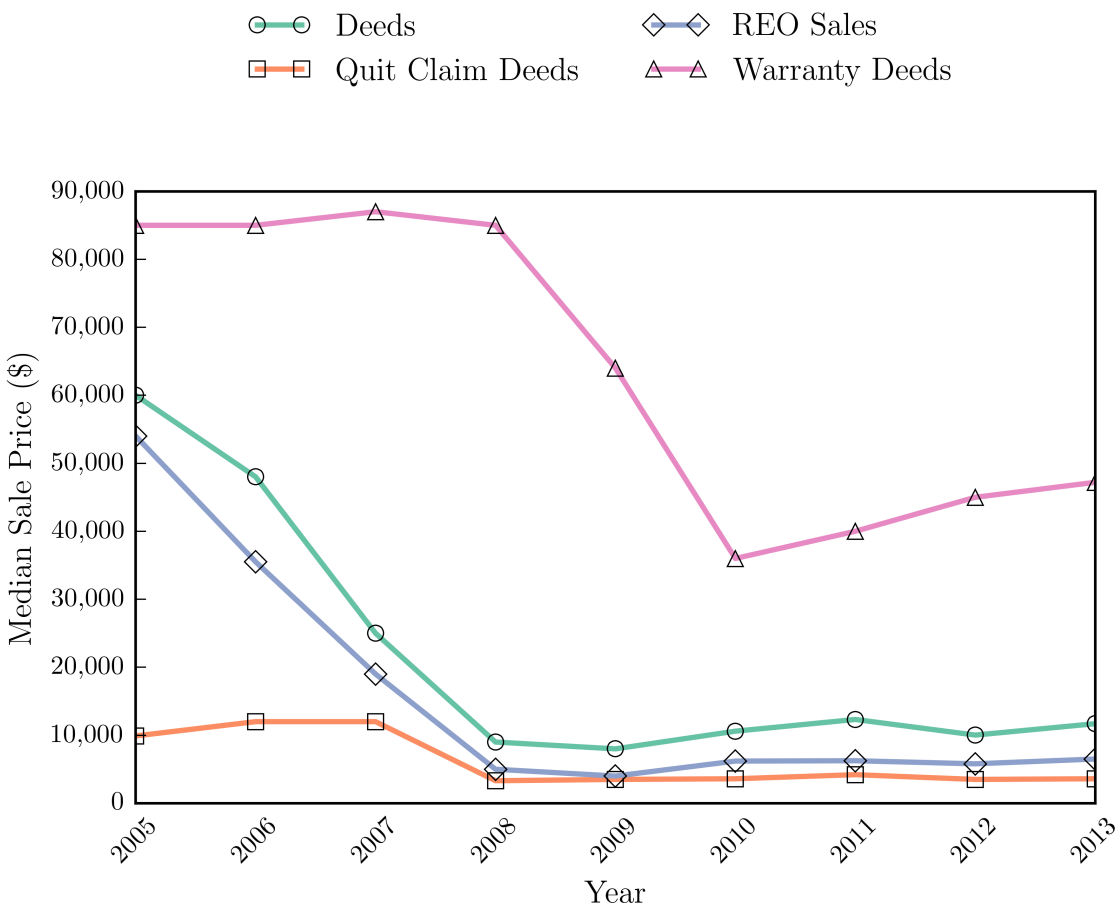

Figure 6.9: Median Sale Price REO Sales and Other Sales, Detroit, 2005–2013. Sources: CoreLogic (2010), Wayne County Register of Deeds (2014).

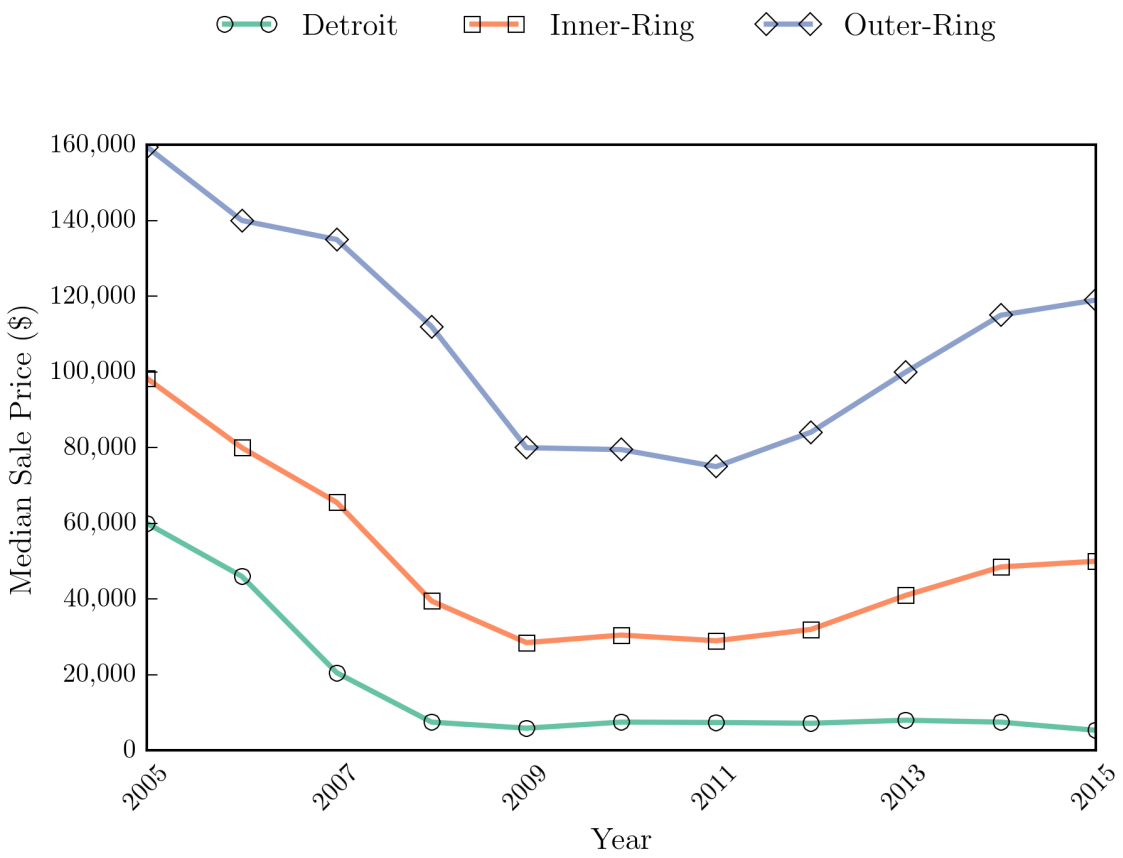

Figure 6.10: Median REO Sale Price, Detroit Tri-County Area, 2005–2015. RealtyTrac (2015b).

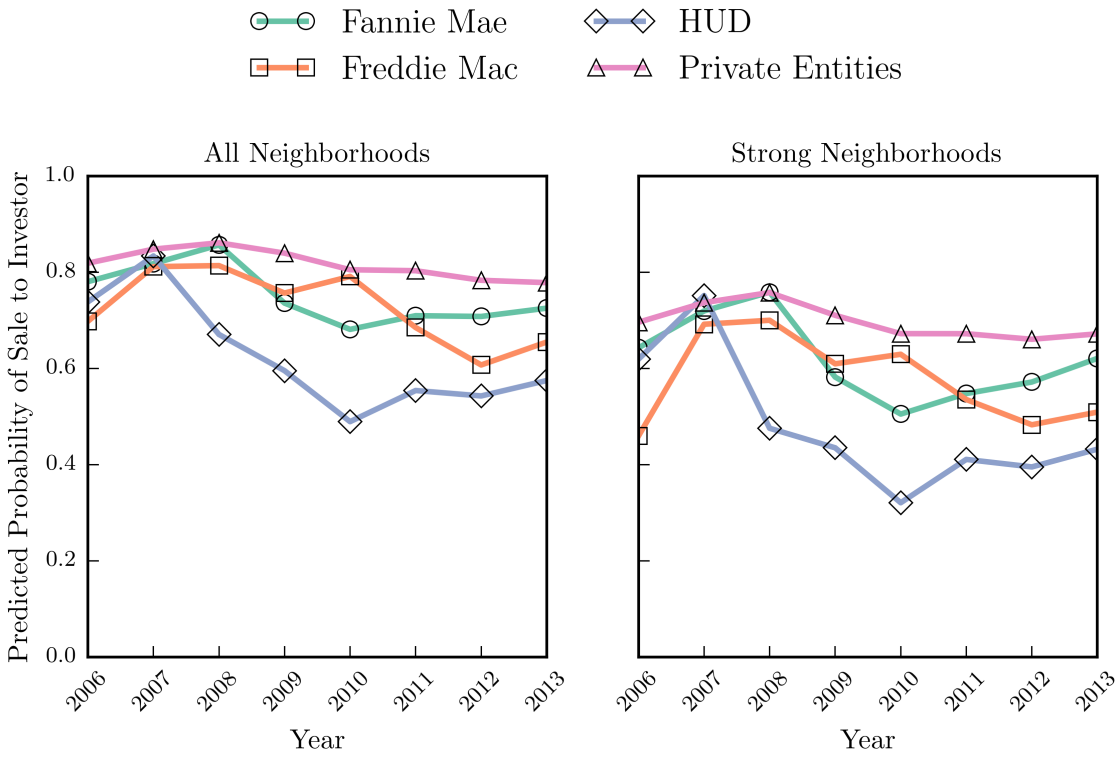

Figure 6.11: Predicted Probability of Sale to Investor by REO Inventory of Origin. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

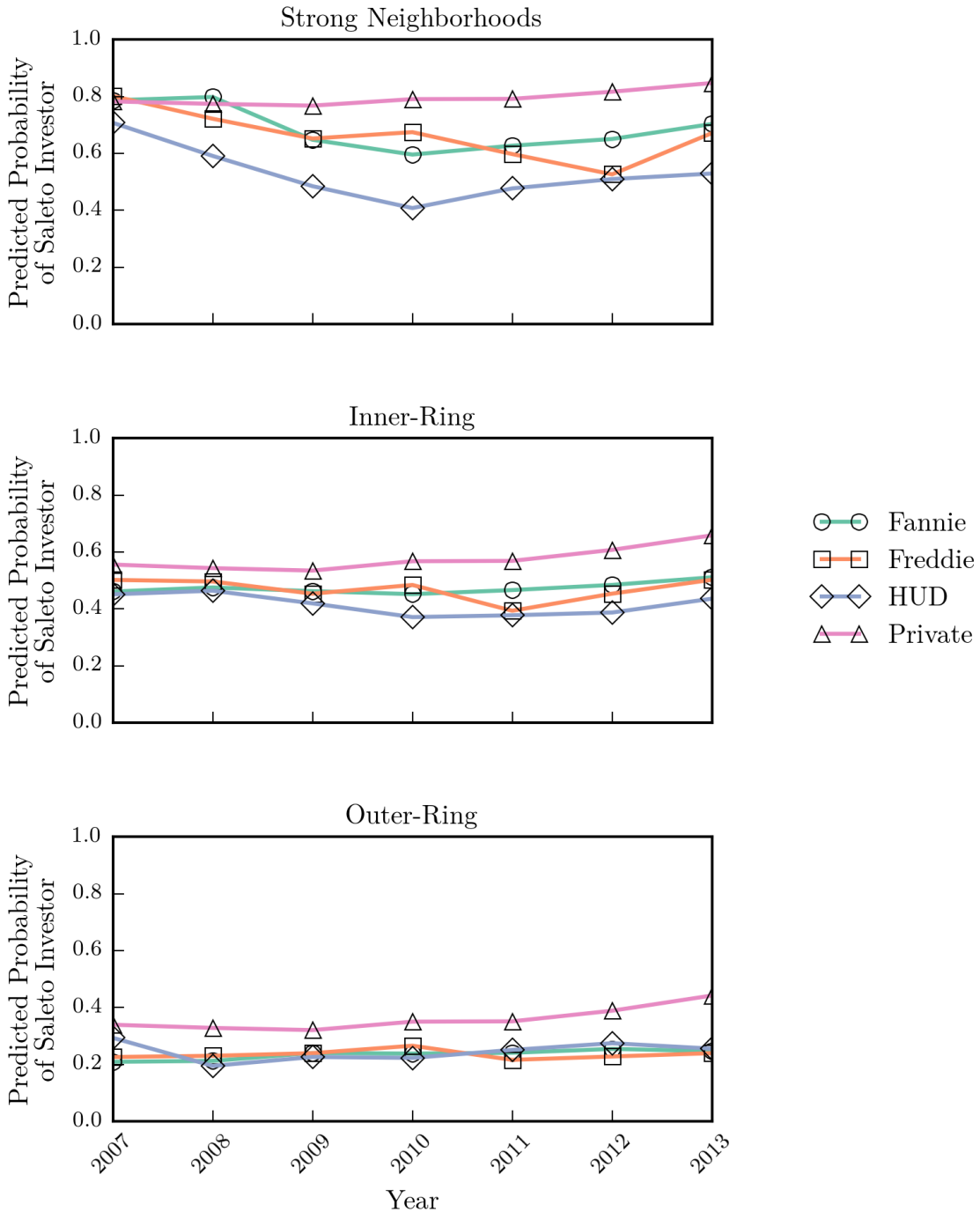

Figure 6.12: Predicted Probability of Sale to an Investor in Detroit's Strong Neighborhoods and Inner and Outer Ring Suburbs by REO Inventory of Origin. Sources: RealtyTrac (2015b), U.S. Bureau of the Census (2000).

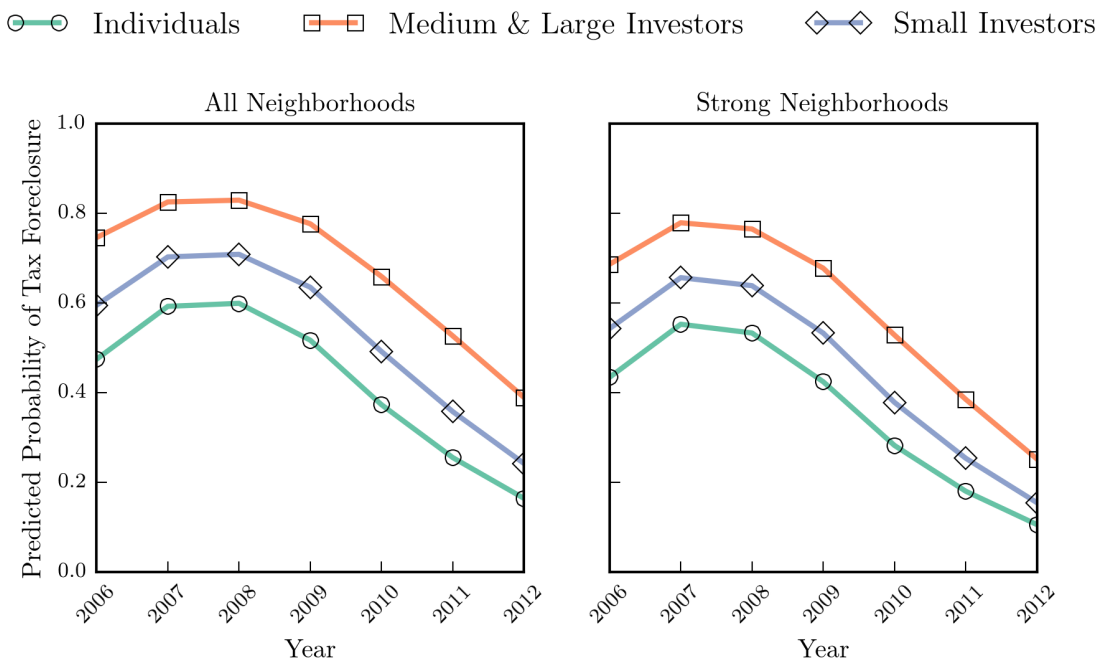

Figure 6.13: Predicted Probability of Tax Foreclosure by Buyer Type, Detroit. Sources: CoreLogic (2010), Loveland Technologies (2015), Wayne County Register of Deeds (2014).

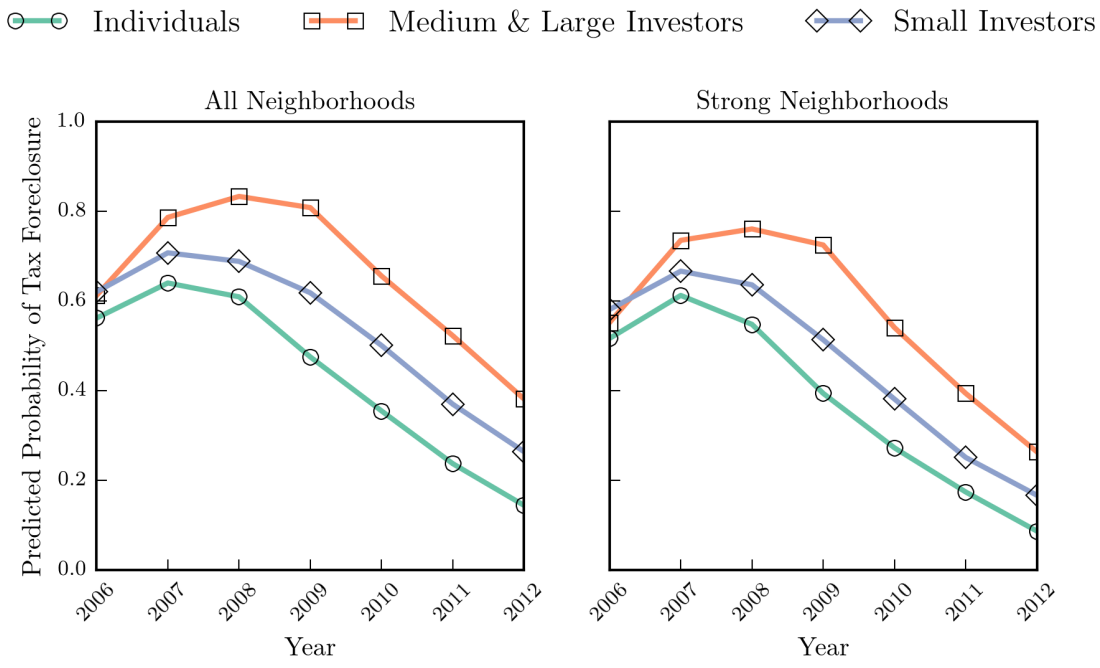

Figure 6.14: Predicted Probability of Tax Foreclosure by Buyer Type including Interaction Terms, Detroit. Sources: CoreLogic (2010), Loveland Technologies (2015), Wayne County Register of Deeds (2014).

CHAPTER VII

Identifying Leading REO Investors

7.1 Largest Buyers in Detroit

The 20 largest buyers of REOs sold by private entities, HUD, Fannie Mae, and Freddie Mac are presented in tables 7.1, 7.3, 7.4, and 7.2.[1] Overall, these tables show that while some investors purchased large numbers of properties, the top investors in terms of purchasing volume account for only a modest share of sales, both relative to the total number of REO sales and sales to investors alone.[2] These findings indicate substantial deconcentration in the market for REOs in Detroit, which is consistent with findings from other cities (Immergluck & Law, 2014). There are notable differences, however, among federal and private entities in terms of the share of sales made to the most active investors. The top 20 investors in Fannie Mae's REOs account for 26% of sales to likely investors, the

[1]Names in the buyer columns in these tables including more than one name (separated by commas) are related entities identified through examination of actual real-estate transaction documents recorded with the Wayne County Register of Deeds and supplemental internet research. My primary means for linking entities was to compare the names of the managing members signing these documents. The total number of REOs acquired by large investors may be slightly under the true value given the difficulties of normalizing names outlined in the methods section. To construct these tables, I examined the 30 largest buyers and combined the totals for parties I knew to be related. In some instances, I queried the database using more complex string matching patterns to generate a count, but only for those parties that at least appeared in the list of the top 30 buyers.

[2]These tables present information on the 20 largest buyers regardless of whether they are investors or government and nonprofit entities. The majority of these buyers are investors, but a few are government and nonprofit entities, e.g., the Michigan Land Bank. Calculations in the table for share of sales to investors exclude government and nonprofit entities. Thus, the data presented for the share of investor acquisitions by the 20 largest investors is slightly lower for Fannie Mae and Freddie Mac, which have government or nonprofit entities among their 20 largest buyers.

greatest concentration among HUD, the GSEs, and private entities, while Freddie Mac had the lowest concentration with the top 20 buyers accounting for just 13% of all sales to investors. The concentration of large investors among HUD's sales to investors (17%) is slightly greater than Freddie Mac, while private entities exhibit a concentration (23%) similar to Fannie Mae. Despite the overall deconcentration of investors in REO properties, a number of individual entities rapidly acquired large numbers of mortgage-reverted properties from the GSEs, HUD, and private entities, which is indicative of bulk purchasing arrangements.

Paramount Land Holdings (aka Interstate Investment Group) of Gilbert, SC was the single largest purchaser of REOs during the study period, acquiring more than 1,000 REOs in 2008 and 2009 from private sources and several hundred more from other REO investors. The majority of Paramount's REO acquisitions had been foreclosed due to defaults on mortgages issued by Long Beach Mortgage Company, one of the largest originators of subprime loans in the 2000s and a subsidiary of Washington Mutual since 1999. These properties were sold to Paramount, at an average price of roughly $700, by Deutsche on behalf of investors in bonds backed by Long Beach and by Washington Mutual. Paramount received a $10 million loan from the Detroit Police and Retirement Fund in 2008 to purchase distressed residential properties and resell them in habitable condition via land contract. Though Paramount used a small share of the loan to purchase REOs in Detroit (its managers spent $5 million of the loan on vacations and luxury items), it failed to pay property taxes and left many, if not most, of its properties unsecured. While Paramount disposed of nearly 25% of the REOs in my database, more than 80% of these sales were to other large investors, some of whom appear elsewhere on my lists of the largest buyers. Where Paramount did make sales to individuals, it sold them in distressed condition at highly inflated prices and failed to disclose arrears on property taxes (Gross, 2015; Guyette, 2012; Snell, 2012).[3] As a consequence, many of the REOs acquired by Paramount, regardless

[3]The number of contract sales to individuals and families is higher than that recorded in my database due to the failure of Paramount and related entities to record transfers with the County. This assertion

of whether they were sold to occupants, were later repossessed for delinquent property taxes. Roughly 740 former REOs owned by Paramount experienced tax foreclosure, while roughly 200 of the properties it sold had the same outcome.[4]

Between 2008 and 2010, the peak years of REO liquidation for private entities, a small group of investors leveraged private capital to acquire vast numbers of REOs at extremely discounted prices, primarily in distressed urban areas (Botos, 2010; Logan, 2009; Ford et al., 2013).[5] This group of investors includes Destiny Ventures (aka SB Ventures), Blue Spruce Entities, and Stonecrest—three of the five largest buyers of private REOs in Detroit. According to media accounts, these investors purchased REOs primarily in order to flip them, reselling properties to other out-of-state investors at several times the price they paid within days of acquiring them. These entities had numerous code violations levied against them in other cities, and they have been accused of passively disposing of distressed properties through tax foreclosure and city-initiated demolition. My findings are entirely consistent with these accounts. Destiny Ventures, the second largest buyer, acquired the majority of its nearly 1,000 REOs from Ameriquest, Argent, New Century, and Deutsche (which purchased, securitized, and sold these subprime lenders' loans) between 2007 and 2009.[6] Among properties for which records indicate a sale amount of at least one dollar (n=701), Destiny Ventures paid a total of $317,446, or $452 per property. Destiny sold roughly 90% of its acquisitions during the study period, 99% of which were sold to other investors, including 57% to large investors. Destiny Ventures sold its properties for $1,500, on average, with a median time to sale of just 53 days. Clearly, Destiny Ventures

about sales prices is derived from the cited sources.

[4]As noted in the methods section, tax foreclosures are the only record for which the study period extends beyond 2013. My post-foreclosure database includes records of properties offered at tax foreclosure auctions in 2014 and 2015, the rationale being tax-reversion is a three-year process, thus it is quite defensible to link the owner of a given property at the end of 2013 to a tax foreclosure occurring in the next year or two. The only limitation of this approach is that some investors likely sold properties without disclosing delinquent taxes.

[5]Since roughly 2012, large institutional investors, including hedge funds, private-quity firms, and real estate investment trusts, have purchased large numbers of REOs as part of REO-to-rental schemes. This type of investor was not active in the early years of the foreclosure crisis.

[6]This includes only years in which Destiny Ventures acquired more than 10 REOs. I follow the same convention in reporting the years in which a given investor was active below.

was engaged in a large-scale flipping operation. Stonecrest was Destiny Ventures largest buyer at 150 properties, illustrating the interconnections among this class of investors.

Destiny Ventures' second largest buyer (101 properties) was TSE Properties, of Sherman Oaks, CA, one of the many shell companries operated by Eric and Sheila Tomasi. The Tomasis acquired nearly 6,000 distressed properties in the Midwest between 2009 and 2011, including many in Cleveland and Detroit (MacDonald, 2011). Their properties came from REO sales—they acquired 61 directly from Fannie Mae and 98 directly from private lenders—acquisitions from other investors purchasing directly from banks, and government auctions of tax-reverted properties. The Tomasis, like many other out-of-state investors purchasing former REOs from Destiny Ventures and its peers, sell properties on contract. Land contracts are a form of seller-financing in which the buyer pays for the property in installments, receiving title only after the buyer has paid the full amount of the property. Buyers are responsible for bringing properties up to code and paying property taxes, but they can be evicted after missing a single payment. Land contracts have long been a means for low-income households or those with damaged credit to finance home purchases, but, because the terms feature high interest rates and the properties often require extensive repairs, they have a high failure rate. For decades, property owners in inner-city neighborhoods have preyed on minority households by convincing them to enter into land contracts the owners know to be unsustainable (Satter, 2010). Contract sellers often design their contracts to fail in order to appropriate the value of the improvements made by the buyer. While it is impossible to ascertain the intent of the The Tomasis, they, like others engaged in contract sales in Detroit, offer properties at onerous terms to households otherwise unable to secure financing. Properties are sold at prices thousands of dollars above what the Tomasis pay for their properties, without the installation or repair of necessary mechanicals. Further, the Tomasis charge interest rates of up to 11%, far above the rate for subprime loans (Kotlowitz, 2009). Reminiscent of the conditions creating the subprime foreclosure crisis in the first instance, the Tomasis sell their

contracts to other out-of-state investors in order to finance additional rounds of property investment. The Tomasis have been sued for selling properties to investors in conditions that would not pass inspection and without clear title (MacDonald, 2011). The Tomasis have also been criticized by activists and public officials in Cleveland and Detroit for the blighted condition of their properties. The Tomasis' handling of former REOs contributed to the staggering 92% tax-reversion rate for properties acquired by Destiny Ventures.

Blue Spruce Entities, another bulk buyer of REOs private sources in 2008 and 2009, sold only 52% of its massive inventory. This entity has absolutely no public presence, so I am left to speculate as to whether Blue Spruce intended to hold these properties, either for contract sales or rentals, or whether it overextended itself in the Detroit market. Blue Spruce paid an average of $831 per property for its inventory of nearly 1,000 properties. Of the properties Blue Spruce managed to sell, 76% went to investors. Based on a review of court documents and news articles, Blue Spruce appears to have had an arrangement with Go Invest Wisely (GIW) of Orem, UT, in which GIW purchased properties from Blue Spruce the same day Blue Spruce acquired them from a bank. In turn, GIW sold the homes on contract and sold the papers for the contract to investors in the US and Canada. Reporting on GIW's practices in Canton, OH, a 2010 news article stated,

> Go Invest Wisely has not fixed up its homes. Instead, it tried to put occupants into them—quickly. Occupants were typically asked to sign 30-year land contracts to buy a home for about $40,000, plus 10% interest. With that completed, Go Invest tried to sell some of the occupied homes, as income-producing property, to an investor in the US or Canada for $17,500, plus $1,000 down. The model enabled Go Invest to pocket as much as $17,500 on a house it had bought for $1,000 (Botos, 2010).

GIW developed a reputation in several cities in the Midwest for the deplorable state of its properties (Botos, 2010; Martin, 2009). For whatever reason, there are only a handful of transfers from Blue Spruce to GIW in Detroit. GIW did, however, acquire more

than 100 properties from Stonecrest, suggesting either shifting business arrangements or regional specializations in the interactions among these investors. The eventual tax-reversion of nearly all the properties that remained in Blue Spruce's possession through the study period (92%) provides further evidence that this company was in the business of flipping properties, like Destiny Ventures, but that it failed to move its inventory. Of course, flipping properties to other out-of-state investors hardly led to a better outcome. Of the properties sold by Destiny Ventures (n=484), 66% were subsequently repossessed for back taxes.

Bryce Peters Financial Corporation, the fourth largest buyer of privately owned REOs, was a front for Blaine Murphy, who has since been convicted for filing fraudulent property records in Cleveland. Murphy operated in Ohio, Michigan, Missouri, and Texas using various LLCs. The Cuyahoga County Office of the Prosecutor (2013) described Murphy's scheme in a press release:

> The scam existed in two phases. First, acquisitions were made with little or no regard for the condition of each property. In his quest to make a fast profit, Murphy ignored property code violations and payments of taxes at the expense of these communities in Cuyahoga County. Secondly, Murphy sold these properties in bulk or individually for a quick profit to various buyers, essentially in the same manner as these properties were acquired.

Murphy was an acquaintance of O'Dell Barnes, who gained national media attention for his massive REO acquisitions (Hagerty, 2007). Barnes, based in South Carolina, was a mentor to Murphy and other REO speculators. George Kastanes–who, along with his wife, served as the principles for Paramount Land Holdings—was Barnes' attorney.

Murphy acquired 767 REOs in Detroit between 2007 and 2009, buying many of them from CitiMortgage, Chase, Wells Fargo, HSBC, and US Bank. Murphy paid roughly $200,000 for properties for which a sales amount of at least one dollar was recorded (n=639), equivalent to $311 per property. Five hundred twenty-one of Murphy's acquisitions were subject

to tax foreclosure while Bryce Peters was either still the owner of record, and 203 additional properties reverted to the County due to back taxes after being sold by Murphy. Altogether, 94% of Murphy's acquisitions were eventually subject to tax foreclosure.

Investors based in the Detroit region also speculated in REO properties in the city, though no one Michigan-based entity purchased as spectacular a number as the investors described above. Innovative Property Solutions (aka WTOTW Homes), based in Southfield, MI, was the sixth-largest buyer of privately owned REOs, and it was a top-ten buyer from Fannie Mae and Freddie Mac. Altogether, Innovative Property Solutions acquired more than 500 REOs. Reuters (2007) spoke with the principle of Innovative Property Solutions, David Ehrlichman, about his approach:

> While the market is down, property auctions in the Detroit area are the stomping ground of people like … Dave Ehrlichman, 27, who buy small family homes valued at around $80,000 to $90,000 for up to $15,000 then "flip" them—sell them quickly on the market for around $40,000.[7]

My database shows that Innovative Property Solutions purchased REOs in Detroit from 2007 to 2011, with the majority of its acquisitions occurring in 2008 and 2009. Innovative Property Solutions paid an average of $9,275 per home. By the end of the study period, it had sold roughly half of its inventory for approximately $30,000 per property. Innovative Property Solutions made most of its sales to individuals (55%) and small investors (67%), suggesting that its position as a local actor may have made it more accessible to prospective owner-occupants and mom-and-pop investors. Like larger, out-of-state operations, however, Innovative Property Solutions acquired a large number of properties, sight unseen, and took a triage approach to dealing with its inventory. Those properties that could be flipped were flipped; the rest they allowed to be repossessed for back taxes. While Innovative Property Solutions was still the owner of record 102 homes were subject

[7]While this particular story focuses on foreclosure auctions, investors like Ehrlichman follow an identical approach in acquiring REOs.

to tax foreclosure.[8]

Some investors in REO properties are based overseas, or serve as proxies or intermediaries for overseas investors, but none were nearly as active in Detroit as Ron Mackie, the principle of Right Buy Properties and Exit Strategy LLC (Guttersohn, 2013).[9] Investment brochures produced by these companies suggest Mackie's operations were based in either London or Singapore, though court documents state he was a Michigan resident. Mackie purchased large numbers of bank-owned properties in Detroit and Florida and sold them to investors in Australia, Singapore, and the UK with promises of annual net yields of 15% and 100% returns on initial investments. These yields were certain, sales brochures state, given strong demand for rental property, rebounding property values, employment growth, and massive government investment in Detroit. According to one brochure,

> The model … was honed in Detroit where there were more disadvantaged families per capita than any other U.S. city. With a seemingly never ending supply of good quality houses, the U.S. government were committed to pumping billions of dollars into local economies and communities: all that we required was front-end investment and a lot of hard work on the ground (InvestUS, n.d.).

Cicada Investments, one of Mackie's downstream shell corporations, offered investors a £27,500 package that ostensibly gave investors clear title to a refurbished property for which a pre-screened tenant had already been secured. Another Mackie operation, InvestUS, focused on flipping properties, seeking investment capital to flip properties to

[8]Sixty-five more were subject to tax foreclosure after Innovative Property Solutions had sold them, perhaps reflecting difficulties on the part of overly-optimistic homebuyers and small investors upon realizing scale of required repairs, a problem compounded by having already paid an inflated amount for a flipped property. To reiterate a limitation of this research noted in the methods section, some parties coded as individuals are in reality investors who had purchased no more than one property in a calendar year in Detroit. In some instances, individuals located out-of-state purchased properties from investors like Innovative Property solutions as investment properties. This is the case for at least a handful of properties sold to likely individuals that were subsequently subject to tax foreclosure.

[9]Mackie is a principle of several other companies involved in real-estate investment, including InvestUS (based in Singapore) and Cicada Investments (based in London). REOs purchased by Right Buy and Exit Strategy are frequently signed over to Investus and Cicada prior to being sold to overseas investors.

qualified low-income Detroit residents (or other investors) and reinvest the returns in yet more REOs to be flipped.

While details concerning the performance of Mackie's operations are wanting, overseas news reports, court cases, and internet forums relate stories of investors failing to receive payment. In June 2014, a Singapore-based reporter wrote,

> Angry investors here are demanding answers from the operators of a United States investment scheme. More than 200 people here could be affected, with $64.8 million yet to be paid back by the scheme, called The Exit Strategy … Returns have been fully paid from June to October 2012, but those who put in money from November 2012 have faced problems. Some have yet to get payments due six months ago (Zhuo, 2014).

Overseas investors have attempted to charge Mackie with fraud related to failure to make payment and misrepresentations concerning municipal liens, but claimants' places of residence prohibited them from bringing legal action against Mackie in the US, where Mackie appears to have established legal residence ("Coast Equities, LLC v. Right Buy Properties, LLC et Al," 2015).

In a November 2015 investor update on its website, Exit Strategy offers investors an explanation for its delays in payment:

> Various legal cases have impacted on the project's ability to perform. Most recently, legal issues have postponed clear title exchanges, and reduced the project's ability to turn over properties, through flipping, following rehab and tenancy. Initially, the Exit Strategy entities contracted with a project company, Right Buy Properties LLC (RBP). RBP received loans from the Exit Strategy entities, and ran the project's acquisitions, construction and property sales. However, the project unfortunately failed under RBP's management. As a result, the directors of the Exit Strategy entities sued RBP for a consider-

> able sum of money…the basic nature of the fraud was that RBP charged the project for refurbishments that never occurred. The project team is working hard to rectify all the previous failings by RBP, and the project is now more settled ("Coast Equities, LLC v. Right Buy Properties, LLC et Al," 2015).

Though seemingly logical, this explanation is complicated by the fact that Mackie is identified with both operations. One investment brochure refers to Mackie as the founder of Exit Strategy and the CEO of Righty Buy Properties. In any event, Mackie was either ill-equipped to act on his intentions or he intentionally defrauded international investors of large sums of money. Regardless of whether Mackie's poor performance in satisfying investors is due to incompetence or fraud, the implications are clearly negative for the properties purchased by Mackie's companies.

In total, Mackie acquired nearly 500 REOs in Detroit between 2010 and 2013—and roughly 150 more from other REO investors—with the largest annual number of acquisitions occurring in 2012. Mackie acquired roughly 200 REOs from HUD, 150 from Fannie Mae, 100 from private sources, and 23 from Freddie Mac. Mackie was HUD's largest buyer and the fifth largest buyer from Fannie Mae. Mackie purchased REOs at an average of $8,700 from HUD, $8,900 from private sources, $10,300 from Fannie Mae, and $11,500 from Freddie Mac. These prices, though still very low, are substantially higher than the prices paid by out-of-state investors in 2008 and 2009, reflecting the slowing of mortgage foreclosures, particularly among private entities, and reductions in the overall supply of REOs. Mackie made few sales, only about 60, the vast majority of which were Quit Claim Deeds to foreign investors, almost certainly participants in the Exit Strategy or another of Mackie's operations. More properties likely have been committed to Mackie's investors, but the deeds have not (yet) been recorded. It is uncertain whether and how many of Mackie's properties are tenanted rather than vacant, though according to the MCM survey, between 40 and 45% of Mackie's properties were vacant during the winter of 2013-2014, more than one year after Mackie made the bulk of his acquisitions. The

prevalence of tax delinquency among Mackie's properties further belies his companies' claims of quickly returning Detroit properties to productive use. Roughly 25% of the REOs Mackie acquired were eventually subject to tax foreclosure either while Mackie remained the owner or after a sale that occurred without clearing delinquent property taxes.

Harbour Portfolio, owned and operated by Charles Vose III, of Dallas TX, purchased REOs exclusively from Fannie Mae and was Fannie Mae's largest buyer. Nationwide, Harbour acquired nearly 7,000 REOs in cities throughout the Midwest and Southwest, nearly all from Fannie Mae. According to a *New York Times* investigation of Harbour,

> Harbour, which raised more than $60 million from wealthy investors, was the single largest buyer of foreclosed homes from Fannie Mae's bulk sale program from 2010 to 2014, which the mortgage giant used to unload more than 20,000 homes that were hard to sell. The homes were bought by Harbour for an average of $8,000 each in cities like Akron, Detroit and Flint (Goldstein & Stevenson, 2016b).

The *New York Times* reports Harbour's business model is predicated on selling properties via land contract, making no repairs prior to sale. Lawsuits brought against Harbour by parties who had entered into land contracts with Harbour suggest it is preying on inner-city households with limited means by charging exorbitant interest rates and stripping buyers of as many legal protections as possible. Further, while Harbour retains the power to evict buyers for failing the bring their properties into habitable condition within four months, Harbour itself is unresponsive to the numerous code violations levied against it in cities nationwide. Harbour's practices are thus likely to exacerbate vacancy, turnover, and deterioration in the neighborhoods in which they are active.

Harbour purchased 376 Detroit REOs between 2011 and 2013, acquiring the bulk, more than 200 properties, in 2011. According to my database, Harbour paid Fannie Mae $778,000 for these properties, or roughly $2,000 per property. My database contains 170 records of sales made by Harbour, most of them made to investors of various sizes (77%). The largest

single buyer from Harbour is Peter Bluebird LLC (aka Direct Properties LLC) of Las Vegas, a company which was the fourth largest buyer at the 2013 auction of tax-reverted properties in Detroit. My database shows Harbour making few contract sales, counter to what I would have expected given media accounts of the widespread nature of Harbour's contract sales, but the absence of contract sales in my database reflects the absence of legal requirements for these contracts to be recorded in the local land records. More than half of Harbour's acquisitions (54%) have since been repossessed due to property tax delinquency. Half of these repossessions occurred while Harbour was still the owner of record. According to the MCM survey, 54% of Harbour's properties were vacant in the winter of 2013-2014. Of the 376 REOs purchased by Harbour in Detroit, 216 are on the BRTF list of blighted properties, 61% of which have either been demolished or are slated for demolition at public expense. The other 39% are potentially rehabable, but require additional investment to mitigate the deterioration caused by Harbours' destructive practices.

The second largest buyer from Fannie Mae is HomeSolutions Properties (HSP), based in Northport, NY. Like many other out-of-state investors, such as Blue Spruce Entities and Stonecrest, there is little publicly available information concerning HSP. An internet search shows HSP was active in Indiana, Ohio, and Pennsylvania, in addition to Michigan, but the true scale of their operations is unclear. The size of their acquisitions in Detroit suggests HSP had a bulk purchasing arrangement with Fannie Mae (n=278), and bulk buyers generally operate in multiple locations. According to a presentation prepared for HSP's realtors, HSP employs four strategies for property disposition:

- Contract sales (i.e., land contracts) using their own staff
- Package sales to investors
- Sales using local real estate agents to list and sell properties
- Online sales via Craig's List and Bid4Assets (HomeSolutions Properties, n.d.)

Regardless of sales method, HSP seeks sales within 60 days of acquiring title, indicating HSP's sole purpose was flipping homes. HSP acquired nearly 300 REOs in 2008 and roughly 40 in 2009, paying, on average, $1,300 per property. A large number of properties were sold to HSP by Fannie for $600 each. HSP sold the bulk of its inventory during the study period (68%), but it took a surprisingly long time for HSP to makes these sales given HSP's intent to flip properties. The median time to sale was 724 days, nearly two years. Also surprising is the fact HSP sold many properties at very low prices. The median sale price was just $1,826; HSP sold 55 properties for more than $5,000 and just 19 for more than $10,000. Through the end of the study period, the difference between what HSP had paid for its properties ($265,000) and what it made from sales ($860,000) was $595,972, a disappointing return if one deducts carrying costs. HSP made 59% of its sales to individuals, though many of these buyers were actually out-of-state investors, likely purchasing properties on Craig's List. Fully 75% of HSP's properties were eventually repossessed due to delinquent property taxes, 22% of these properties were repossessed while HSP was still the owner of record. 65% of HSP's properties were on the BRTF's blight list, with 39% of HSP's properties either demolished or flagged for demolition. Given these outcomes, it is likely that HSP purchased REOs sight unseen and severely overestimated the market for distressed properties in Detroit, leading it to offload properties at fire-sale prices and withhold property taxes on its remaining inventory.

In third place among Fannie Mae's buyers is a collection of entities operated by Vision Property Management (VPM) of Columbia, SC and its CEO, Alex Szkaradek. VPM's website states that it is "the country's largest provider of lease-to-own properties," but it also sells properties for cash (Vision Property Management, n.d.). VPM and the multiple LLCs operating on its behalf acquired roughly 200 REOs from Fannie Mae between 2011 and 2013, paying, on average, $1,500 per property. Through the end of the study period, VPM sold 40 properties at an average price of $6,700, though it had likely entered land contracts with a larger number of buyers. The listings on VPM's website offer additional

insight into its practices. VPM purchased 12739 Hamburg St from Fannie Mae in January 2013 for $351 and recently listed it for a cash purchase price of $3,000 in as-is condition ("Vision Property Management," n.d.). Though this is an extremely low purchase price, the property requires substantial repair. The website includes several photos of the property, one of which shows a missing rear bay window, meaning the property is open to the elements. The website for MCM includes a January 2014 image of the photo in which a sign posted to a boarded window advertising the property for $150 down and $90 a month is clearly visible, though the final sale price for a contract deal is unclear. This property is located on a block where the City of Detroit and the Michigan Land Bank have demolished numerous structures, begging the question why, if Fannie Mae was willing to write down the mortgage debt of $85,000 to $350, it wouldn't simply donate the property to the land bank along with a contribution toward its demolition. Given the location and condition of the property, it is improbable that a buyer would want either the property or the lot. According to the MCM survey, 56% of VPM's properties were vacant in winter of 2013-2014. Further, the BRTF reports 57% of VPM's properties have either been demolished or are slated for demolition at public expense, and 34% of the properties still owned by VPM through the end of the study period reverted to the county for back taxes.

Closely following VPM in acquiring REOs from Fannie Mae is Coseo Properties Inc. (CPI) of San Diego, CA, which purchased nearly 200 properties from Fannie Mae using several different LLCs in 2010 and 2011 (CPI purchased a total of 215 REOs from various sources). A 2013 media statement details the scale and scope of their operations:

> In the last three years, Coseo Properties acquired, rehabilitated, leased, and successfully sold nearly 3,000 single-family homes around the country. In Michigan, alone, CPI acquired some 700 homes and has since converted 150 homes to rental properties. CPI is definitely an opportunist investor. Today, in its constant effort to operate ahead of the mainstream, CPI is focusing exclusively on investments in Detroit Metro (Business Wire, 2013).

Like other bulk buyers, CPI paid a small average amount per property, just $1,500. By the end of the study period, CPI had sold 75% of its inventory at an average price of $4,800. It sold a larger share of properties to individuals, 24%, than most bulk buyers, and many of the "individuals" identified in the dataset actually appear to be local households, not out-of-state investors buying properties on Craig's List. Among bulk buyers, it sold the largest share of properties with clear title (30%), evidenced by the use of Warranty Deeds. Many of CPIs properties, however, were repossessed for delinquent property taxes, particularly among the properties it sold to investors (67% tax-reversion rate among properties sold to investors as opposed to 31% reversion rate for properties sold to individuals). In total, 44% of the properties CPI eventually became tax-reverted, and 52% of the former REOs CPI failed to sell by the end of the study period were also subject to tax foreclosure. According to the MCM survey, 43% of VPM's properties were vacant in winter of 2013-2014, and among all properties handled by CPI, 33% are marked by the BRTF as demolished or slated for demolition.

While Fannie Mae indeed disposed of a large number of properties through bulk purchase arrangements with large out-of-state investors, it also sold a number of properties to the Michigan Land Bank Fast Track Authority and the DLBA, placing both entities among Fannie Mae's largest buyers. Like land banks operating elsewhere, the primary function of these two entities is to acquire, assemble, and dispose of public property in a manner likely to result in the productive use or reuse of those properties. According to media releases, Fannie Mae sold 44 REOs to the DLBA in 2014 for a nominal fee while also contributing funding for the demolition of 18 of those properties (Gallagher, 2014).

HUD's second largest buyer after Ron Mackie was EZ Access Funding, based in Newport Beach, CA. EZ Access purchased 128 REOs from HUD in 2008 and 2009 (EZ Access purchased 172 REOs total in Detroit from various sources). Among properties for which sales record a transaction amount of at least one dollar, EZ Access paid HUD on average $1,800 per property. One of the principals of EZ Access, Marc Tow, was sentenced to five

years in prison in Cuyahoga County for defrauding investors under the pretense investors' money would be used to repair and tenant the large number of properties acquired by EZ Access from HUD. Instead, EZ Access absconded with investors' money and left the properties they acquired from HUD to deteriorate. As of November 2013, the City of Cleveland and the Cuyahoga Land Bank had demolished more than 60 of the 190 properties purchased by EZ Access in Cuyahoga County (Editorial Board. cleveland.com, 2013). Of the 128 properties sold by HUD to EZ Access in Detroit, 89% have since been repossessed due to delinquent property taxes. Of the 172 total REOs EZ Access purchased in Detroit, 74% are on the BRTF list of blighted properties. Of the properties on the blight list, 60% of them have either been demolished or are slated for demolition at public expense. Given these negative trends in CPI's inventory, it begs the question whether CPI entered the market for distressed properties fully intending to support neighborhood development—an objective clearly marked out in their mission statement—but became overwhelmed, or whether CPI deliberately pursued a triage approach to handling their properties, like many of the bulk buyers discussed above.

HUD's fourth and fifth largest purchasers, KHTJ Properties and Metro Property Group (MPG), are Detroit-based entities that collaborated in a global Ponzi scheme. These two entities are are also among Fannie Mae and Freddie Mac's 20 largest buyers. KHTJ Properties, operated by Keith H. Travis, Jr., of Detroit, MI, quit claimed the majority of its REO acquisitions to Metro Property Group, based in Dearborn, MI. MPG, in turn, sold its substantial inventory of mortgage- and tax-reverted properties to overseas investors, making fraudulent promises to tenant and manage the properties for the absentee owners. In short course,

> investors were told virtually the same thing: The tenant was evicted and caused significant damage to the homes. The investors were billed for evictions that never happened, fined for housing violations and were given estimates of the required repairs, upwards of $13,500, according to the suit

(Neavling, 2013).

In total MPG and KHTJ purchased 239 REOs from various sources between 2010 and 2013, though this is likely an underestimate given the numerous LLCs and family member names used to acquire properties. MPG and KHTJ paid, on average, roughly $11,000 per property, and they sold 85% of their inventory at an average price of $42,000 per property to overseas investors.[10] Many of of these properties have likely experienced deterioration due to extended vacancy periods and lack of maintenance. Nearly half (47%) of the REOs acquired by MPG and KHJT are on the BRTF's list of blighted properties, and 33% were recorded as vacant on the MCM survey of property conditions.

Given the small size of Freddie Mac's inventory in Detroit, it is impossible for any one buyer to have acquired hundreds of properties from them, but two of the bulk buyers already discussed, Ron Mackie and Dave Ehrlichman are among Freddie's five largest buyers, along with locally based MPG at number five. Freddie Mac's largest buyer at 44 properties, Charles Lee of Las Vegas, NV, also purchased 84 properties from private sources. Fully 100% of Lee's properties entered tax foreclosure, 77% of them while he was still the owner of record.

7.2 Discussion

This look at the practices of the largest buyers of REO properties in Detroit and the outcomes associated with their properties supports claims that large out-of-state investors harmed properties and neighborhoods through their opportunistic, short-sighted, negligent, and often criminal handling of REOs. The GSEs, HUD, and private sources all had bulk purchasing arrangements with investors intent on flipping properties and making predatory contract sales rather than engaging in sustainable business practices likely to

[10]MGP acquired approximately 1,600 properties in Wayne County since 2009, the vast majority coming from the Wayne County tax foreclosure auctions, where MPG acquired numerous properties for just $500. These properties were also flipped to overseas investors at prices up to $50,000.

support and strengthen neighborhood conditions. These large investors have deeply exacerbated problems initiated by the mortgage foreclosure crisis by creating widespread churn in the housing market, selling properties to absentee owners making fraudulent representations about property management and maintenance, and clouding title by filing fraudulent deeds. In turn, these practices are likely to have discouraged owners and residents of neighboring properties from investing in their homes, further increasing vacancy rates. Investor practices downloaded responsibility for these former REOs to the city and county government, through tax-reversion and demolition, after investors extracted profits from the destruction of Detroit properties. In the case of properties that had been sold to investors by the GSEs and HUD, this destruction was effectively publicly subsidized given the government takeover and recapitalization of the GSEs and the enormous discounts federal entities gave to large-scale speculative investors.

Table 7.1: Top 20 Buyers of REOs from Private Entities, 2005–2013

Buyer	Location	REOs	Share of all sales	Share of sales to investors
Paramount Land Holdings	Gilbert, SC	1,010	2.84%	3.81%
Destiny Ventures, SB Holdings	Tulsa, OK	991	2.79%	3.74%
Blue Spruce Entities	Rapid City, SD	923	2.59%	3.48%
Bryce Peters Financial Corp.	Reno NV	767	2.16%	2.89%
Stonecrest Investments	San Jose, CA	344	0.97%	1.30%
Innovative Property Solutions	Southfield, MI	340	0.96%	1.28%
LWBR LLC, MDJ LLC	Silver Spring, MD	327	0.92%	1.23%
Homsales, Inc.	San Diego, CA	301	0.85%	1.14%
National Asset Management Group	Las Vegas, NV	232	0.65%	0.88%
Phoenix Real Estate	Detroit, MI	113	0.32%	0.43%
Dade LLC	Macomb, MI	102	0.29%	0.38%
CRN Management	Chicago, IL	99	0.28%	0.37%
Eric and Sheila Tomasi	Sherman Oaks, CA	98	0.28%	0.37%
Ron Mackie	United Kingdom	87	0.24%	0.33%
Urban Development Solutions Group	Troy, MI	87	0.24%	0.33%
Innovative Holdings Group	Orange County, CA	85	0.24%	0.32%
Laker Group	Livonia, MI	85	0.24%	0.32%
Charles Lee	Las Vegas, NV	84	0.24%	0.32%
G8 Capital Fund	Ladera Ranch, CA	83	0.23%	0.31%
Oliver Property Holdings	Eastpointe, MI	74	0.21%	0.28%
Total Investor Sales		6,232	17.52%	23.51%

Sources: Author's calculations from CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 7.2: Top 20 Buyers of REOs from HUD, 2005–2013

Buyer	Location	REOs	Share of all sales	Share of sales to investors
Ron Mackie	United Kingdom	204	2.19%	4.48%
EZ Access Funding	Newport Beach, CA	128	1.38%	2.81%
Isaac Taylor	Detroit, MI	44	0.47%	0.97%
KHTJ Properties	Detroit, MI	40	0.43%	0.88%
Metro Property Group	Dearborn, MI	36	0.39%	0.79%
S & J Real Estate Investments	Detroit, MI	34	0.37%	0.75%
Capital One Funding Corp.	Southfield, MI	32	0.34%	0.70%
Steven Mackey	St Petersburg, FL	32	0.34%	0.70%
Elite Investment Homes	Shelby Twp, MI	28	0.30%	0.61%
James Toma	Farmington Hills, MI	27	0.29%	0.59%
Daniel H Gabriel Property Management	Lapeer, MI	23	0.25%	0.50%
MI Housing & Renovation	Farmington Hills, MI	23	0.25%	0.50%
BAB Holdings, Bazzi Ventures	Dearborn, MI	21	0.23%	0.46%
AMA Property Management, Amadeg & Associates	St Clair Shores, MI	19	0.20%	0.42%
Brian Schieferstein	Sterling Heights, MI	19	0.20%	0.42%
Innovative Property Solutions	Southfield, MI	17	0.18%	0.37%
Detroit Residential Opportunity Fund	Livonia, MI	16	0.17%	0.35%
Dream Star Properties	Oak Park, MI	16	0.17%	0.35%
AMG Holdings	Dearborn, MI	16	0.17%	0.35%
Platinum Investment Group	Ephraim, UT	16	0.17%	0.35%
Total Investor Sales		791	8.50%	17.37%

Sources: Author's calculations from CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 7.3: Top 20 Buyers of REOs from Fannie Mae, 2005–2013

Buyer	Location	REOs	Share of all sales	Share of sales to investors
Harbour Portfolio	Dallas, TX	376	3.25%	5.21%
Homesolutions Properties	Northport, NY	278	2.40%	3.86%
Vision Property Management	Columbia, SC	204	1.76%	2.83%
Coseo Properties, Inc.	San Diego, CA	195	1.69%	2.70%
Ron Mackie	United Kingdom	151	1.31%	2.09%
Innovative Property Solutions	Southfield, MI	106	0.92%	1.47%
Michigan Land Bank	Lansing, MI	100	0.86%	-
S & J Real Estate Investments	Detroit, MI	87	0.75%	1.21%
Metro Property Group	Dearborn, MI	67	0.58%	0.93%
Eric and Sheila Tomasi	Sherman Oaks, CA	61	0.53%	0.85%
Detroit Residential Opportunity Fund	Livonia, MI	60	0.52%	0.83%
Salem One	Dearborn, MI	60	0.52%	0.83%
Detroit Land Bank Authority	Detroit, MI	53	0.46%	-
SWE Homes MI	Bellaire, TX	48	0.41%	0.67%
Smart Homes Investments	Vancouver, BC	41	0.35%	0.57%
KHTJ Properties	Southfield, MI	30	0.26%	0.42%
Mount Moriah Community Development Corporation	Detroit, MI	30	0.26%	-
Stonecrest Investments	San Jose, CA	28	0.24%	0.39%
BC REO Fund	Clearwater, FL	27	0.23%	0.37%
Hartwell Mortgage Group	Delaware	27	0.23%	0.37%
Total Investor Sales		2,029	17.54%	25.50%

Sources: Author's calculations from CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 7.4: Top 20 Buyers of REOs from Freddie Mac, 2005–2013

Buyer	Location	REOs	Share of all sales	Share of sales to investors
Charles Lee	Las Vegas, NV	44	1.84%	3.03%
Ron Mackie	United Kingdom	25	1.05%	1.72%
Innovative Property Solutions	Southfield, MI	16	0.67%	1.10%
Detroit Residential Opportunity Fund	Livonia, MI	11	0.46%	0.76%
Metro Property Group	Dearborn, MI	10	0.42%	0.69%
Domas Holdings	Baton Rouge, LA	8	0.34%	0.55%
Eastlawn LLC	Detroit, MI	8	0.34%	0.55%
Marcus Johnson	Royal Oak, MI	8	0.34%	0.55%
Rayford Frye	Southfield, MI	7	0.29%	0.48%
Grandmont-Rosedale Development Corp.	Detroit, MI	7	0.29%	-
Manna Development Corp.	Detroit, MI	7	0.29%	0.48%
Platinum Investment Group	Ephraim, UT	7	0.29%	0.48%
Trademark Assets	Redford Twp, MI	7	0.29%	0.48%
BAB Holdings, Bazzi Ventures	Dearborn, MI	7	0.29%	0.48%
Downer Development	Detroit, MI	6	0.25%	0.41%
Eddie Dubose	Sherman Oaks, CA	6	0.25%	0.41%
Fat Mammas Real Estate	Perris, CA	6	0.25%	0.41%
Homesales Inc.	San Diego, CA	6	0.25%	0.41%
Tyler Durden	Mt Clements, MI	6	0.25%	0.41%
Innovative Holdings Group	Orange County, CA	5	0.21%	0.34%
Total Investor Sales		207	8.67%	13.79%

Sources: Author's calculations from CoreLogic (2010), Wayne County Register of Deeds (2014).

CHAPTER VIII

The Pace of REO Sales

This chapter examines the duration of properties in REO inventories, focusing on differences among federal and private entities in terms of the time between completed mortgage foreclosure and sale. Previous research of this issue found that the rate at which REO properties exited inventory rose precipitously between 2007 and 2008, when federal and private entities were contending with newly swollen inventories of mortgage-reverted properties (Immergluck, 2012; Y. S. Lee & Immergluck, 2012). According to these studies, many of the properties being sold at such a fast rate during this time were going to investors, particularly in lower-income neighborhoods. As a result, municipalities were unable to make adequate use of NSP funding for acquiring foreclosed properties (Coulton et al., 2008; Immergluck, 2012). This swift sale of properties to investors is linked to negative outcomes for the neighborhoods in which these former REO properties are located, as evidenced in prior research and in other chapters of this dissertation (Ford et al., 2013; Coulton et al., 2008; Hwang, 2015).

Previous studies of REO dispositions are predicated on the assumption that the pace of REO sales is primarily a function of price. Parties selling distressed properties are viewed as being motivated to sell their inventory as quickly as possible, with the proviso that they are simultaneously motivated to maximize short-term returns (Shilling, Benjamin, & Sirmans, 1990). Lenders and other parties responsible for selling REOs are thus expected to

set prices based on an analysis of net present value (NPV), which involves the integration of numerous property- and location-specific factors in determining whether it is more remunerative to hold or sell a property (Immergluck, 2012; Theologides, 2010). Properties located in areas where home values are declining or expected to decline are expected to be priced to sell more quickly than properties in areas where home price are stable, rising, or expected to rise.

While this assumption concerning the relationship between expectation, price, and time-in-inventory is reasonable, several supply-side characteristics of federal and private entities are likely also influential in determining the duration of REO properties. Y. S. Lee and Immergluck (2012), in explaining their finding that the GSEs sold properties at a quicker pace than either private entities or HUD, speculated this difference was largely due to efficiencies born of standardization and centralization, as well as pressure from the FHA to accelerate sales to promote liquidity. Many privately held REO properties, on the other hand, are sold by a decentralized network of servicers lacking the discretion to set and move prices in the field. Lowering prices on properties purchased with loans later incorporated into securitized trusts can be complicated by the numerous investor groups having interest in these properties and the differing levels of risk to which each is exposed. Investors purchasing bottom-level tranches have little to no incentive to have properties priced at a loss, as this can effectively wipe out their investment (Y. S. Lee & Immergluck, 2012). Many large servicers, however, have discretion over REO sales prices, as set out in their Pooling and Servicing Agreements (PSAs). The process through which HUD acquires REO properties can significantly add to its disposition times, particularly the delayed transfer of properties from mortgage servicers to HUD. The U.S. Government Accountability Office (2013) found that the national average time between foreclosure sale and the initial valuation, which occurs once a property is ready to be listed, was 184 days for HUD, while the comparable figures for the two GSEs was just 66 and 69. [1]

[1]The duration between foreclosure sales and valuation is expected to be longer in Michigan, however, as valuation cannot occur until after the expiration of a six-month redemption period. These periods are

While previous research has focused on the potential risks posed by rapid sales of geographically concentrated REOs to investors, there is also reason to be concerned about excessive holding times for REO properties, particularly those owned by HUD. What these two issues, fast and excessively slow sales have in common is the increased likelihood of vacancy, vandalism, and deterioration—the primary mechanisms though which foreclosures generate negative spillovers (U.S. Government Accountability Office, 2011). In this chapter I argue that congressional pressure to reduce inventory and the FHFA's emphasis on the portfolio perspective in overseeing the GSEs led Fannie Mae and Freddie Mac to rapidly dispose of inventory in Detroit as their inventory grew, making few, if any repairs (Dixon, 2011). These sales practices, in turn, greatly increased the likelihood of those properties being sold to investors, many of whom would allow them to remain vacant and deteriorate. Second, I argue that HUD's divided approach to taking control of properties after foreclosure greatly increased their time in inventory, during which time they sat vacant and unattended (see Figure 8.1 for median days between foreclosure and sale). Third, I will argue these problems are most severe in the City of Detroit in comparison to its suburbs. The GSEs' concerns over financial safety and soundness, I argue, influenced their downward valuation of REOs in Detroit, even in the city's strong neighborhoods.

8.1 Data and Methods

In order to compare the role the type of institution owning a given REO property has on time-to-sale, I employed a series of Cox proportional hazards models, using both the Detroit-specific database and the Regional database of post-foreclosure pathways. Proportional hazards models are a type of survival analysis, the defining aspect of which is that they take time to an event as the dependent variable. Unlike logistic regression, which also involves the prediction of a dichotomous outcome, survival analysis allows for and

frequently extinguished before the end of six months, however, by servicers' delivery of affidavits of abandonment.

takes advantage of information from censored observations, i.e., observations which may or may not have experienced the event of interest after the end of the study period. The reasons for the use of regression analysis in the first place is the fact that time to sale is a function of many variables, including the year of the foreclosure and the character and location of the property. Descriptive statistics may reflect systematic differences in the type and location of properties in federal and private entities portfolios. I use regression analysis in this chapter to control for those confounding factors.

One of the key assumptions of proportional hazards models is precisely that the hazards are proportional, which means that the hazard ratio, or the ratio of the instantaneous rate of occurrence of an event, for any two subjects who are characterized by different sets of covariates depends only on the value of those covariates and not on time. Proportionality can be assessed via plots of the survival curves to assess whether the curves for any two strata remain proportional over time. By fitting a proportional hazards model taking Fannie Mae, Freddie Mac, and HUD as dummy variables—with private entities being the reference category—I found that the curves were proportional through at least the first half of the study period, but they lost proportionality later. Some of the curves crossed paths in the final years of the study period, indicating a clear violation of the assumption of proportional hazards. A common approach for addressing non-proportionality in data is to include time as an interaction term. This approach for overcoming non-proportionality fits well with my interest in examining time-variant differences in the pace of disposition among federal and private entities.

The dependent variables included in these models closely resemble those included in the logistic regression of investor purchase on a set of dummy variables coded to separately capture the interaction of seller and time, or, in the case of the regional model, to separately capture the interactions of seller, time, and location. In the present case, I interact seller with the year of foreclosure, not the year of sale, though they may be the same. The data used to perform these analyses includes every REO property in my two

databases from years 2005 to 2013. This is also a departure from the logistic regression analysis of investor purchase, which included only properties that entered REO through the end of 2012 to reduce any potential biases due to censored observations.

8.2 Detroit-Only Models

Table 8.1 presents the results of the model fitted with sales from (1) all residential areas in Detroit, (2) strong neighborhoods, and (3) other neighborhoods for years 2005 to 2013. The values in the columns are the hazard ratios. A hazard is the rate at which events occur, in the present case, an REO sale. For dummy variables, a hazard ratio is the ratio of the hazard for one level of a variable to the hazard of the reference category. Values larger than 1 such indicate a greater likelihood of being sold in the next unit of time, while values smaller than 1 indicate a lesser likelihood of being sold in the next unit of time. Consistent with the findings of Y. S. Lee and Immergluck (2012), I find a steady increase in the hazard ratio for the year of foreclosure relative to 2005 from 2006 through 2008. The hazard ratios for the year 2008 indicator ("shdyear2008") is 1.5 in model 1 and 1.6 in model 2, meaning that properties that entered REO inventory in 2008 are predicted to sell at half again (1.5 times faster) the rate of properties that entered REO in 2005. The coefficient for 2009 is not significant, while the coefficients from 2010 through 2012 indicate a slowing of the rate of disposition prior to a substantial year-over-year increase in the hazard rate in 2013. The slower pace of sales after 2009, I would argue, reflects reduced pressure to offload properties as inventories shrank during the previous years of rapid sales, as well as, perhaps, improvements in risk-based pricing and expectations regarding home price appreciation (Reindl & Tanner, 2016).

In terms of the coefficients for federal entities, the hazard ratios for the GSEs are statistically significant and well above 1 for most years, even exceeding 2 in both 2009, 2010 and 2012, meaning GSE properties were selling twice as fast as privately held REOs during those years. While the parameter estimates above 1 for the GSEs be explained in part

by the greater standardization of the enterprises' sales practices point out by Y. S. Lee and Immergluck (2012), I argue the accelerated time indicated by the hazard ratios for the GSEs from 2009 through 2012 reflects the sharp increase in the pace of REO starts for the enterprises. This is the period during which congressional pressure to accelerate sales would have had a measurable impact in the annual rate of sales for the two GSEs.

The hazard ratios for HUD, on the other hand, are statistically significant and less than 1 through 2009, as expected, though the ratios climbed from roughly 0.39 in 2007 to 0.92 in 2009. It should be noted, however, that the pace of private entities' sales of REOs slowed from 2008 to 2009 and that the coefficient for HUD in 2009 reflects a narrower gap between HUD and private entities as the pace of the private entities' sales slowed. For years 2010 to 2012 the hazard ratios for HUD are statistically significant and just above 1 for the citywide model, while they were only significant in the strong neighborhoods model in 2010 and 2012, and significant only in 2011 in the other neighborhoods model. Just as with the rise in the hazard ratio for HUD from 2008 to 2009, however, these above 1 values for 2010 through 2012 must be interpreted along with the coefficients for private entities (same as the foreclosure year), which continued to fall after 2008. In sum, these coefficients are consistent with my claim that HUD-owned properties, overall, sold at a substantially slower pace than other other REOs. These differences were greatest between HUD and private entities between 2005 and 2008, after which the slowing pace of sales of privately owned REOs closed the distance between private entities and HUD. The difference between HUD and the GSEs remained quite large, even after the overall slowing of the pace of sales after 2009.

In addition to these indicators of year of entry and type of seller, several other covariates are significant, though the magnitudes of these hazard ratios' difference from 1 are quite small. Among the variables controlling for property characteristics, floor area has a small negative impact on time-to-sale in models 1 and 2. Among variables estimating the effect of neighborhood-level housing market indicators, both poverty rate and me-

dian household income have a negative impact on time-to-sale in model 1, while median household income alone is significant in model 2. Census tract owner-occupancy rate, on the other hand, exerts a positive impact on the sales rate in models 1 and 2. The spatial log of home sale prices is significant in models 1 and 2 and positive, though the practical difference is very small. Longitude (x) is also significant across models, exerting small negative impact on the sale rate with increasing distance to the west.

8.2.1 Low-Value Properties

Prior research in Atlanta found that low-value properties, defined as those with an estimated value of less than $30,000, were at a a greater risk of being sold more rapidly by the two GSEs, as well as HUD. Y. S. Lee and Immergluck (2012) speculated that HUD dealt more aggressively with low-value properties than higher-value properties. Given what I had discovered about difficulties in transferring properties from servicers to HUD after foreclosure in Detroit and Cleveland, I was curious whether HUD would actually have sold any category of properties at a quicker pace than private entities. Table 8.2 presents the results of the proportional hazards models using only low-valued properties, defined as those having an assessed value in the lowest quartile of the dataset (< $23,340). The hazard ratio for Fannie Mae in 2010 in strong neighborhoods is noticeably larger here than in Table 8.1, moving from 2.54 to 2.80. Similarly, the hazard ratio for the entry year with the largest hazard ratio for Freddie Mac, 2009, moves from 2.64 to 3.20 when examining just lower-value properties in strong neighborhoods. Looking at the indicators for HUD, there are no indications of the drastic change in direction of effect as seen found by Y. S. Lee and Immergluck (2012). What I found, rather, is modest increase in the hazard ratio from 2010 to 2012, suggesting that there may indeed be a small interaction between assessed value and ownership by HUD in explaining time-to-sale. Outside of the changes in the peak years for the GSEs in model 2 and the increase in hazard ratios for HUD in models 1 and from 2010 and 2012, however, few indicators exhibit meaningful changes

between these two tables, which is consistent with the finding that assessed value does not have a statistically significant relationship with time-to-sale.

8.3 Regional Model

In order to examine differences across space in the Detroit metropolitan area, I fit the data in my regional database of post-foreclosure pathways to a proportional hazards model where year of entry is interacted with seller, as in the Detroit-only model, as well as location, specifically, location in one of three areas: (1) strong neighborhoods in the city of Detroit, (2) inner-ring suburbs, and (3) outer-ring suburbs. The definition of these areas is discussed in Chapter IV. Thus, the independent variables included in the regional proportional hazards model of time-to-sale are similar to those included in the regional logistic regression model of investor acquisition, but, as with the Detroit-only model, seller is interacted with year of entry, not year of sale. In addition to the indicator variables reflecting each combination of entry year, seller, and location, the model also estimates the main effect of location and year. I also fit a second model including the interaction of entry year and location to capture annual differences in the pace of REO sales across space.

Table 8.3 presents the results for these two models. The hazard ratios for annual effects in model 1 are significant and positive in 2007 and 2008, as in the Detroit-only model, but the hazards ratios are also significant and positive for years 2011 through 2013, which is not consistent with the Detroit-only model. This discrepancy is likely explained by differences in the geography and time of REO accumulation in the Detroit metropolitan area. While the number of completed mortgage foreclosures peaked in Detroit in 2007, after which the annual number of foreclosures fell precipitously, the annual number of foreclosures in inner- and outer-ring suburbs rose greatly in 2007, but did not peak until 2010. This difference, in turn, is likely explained by there having been a larger share of private-label subprime loans originated in Detroit than in suburban locations, where loans

acquired by the GSEs, which were more likely to have been underwritten in conventional terms, constituted a larger share of originations. The later surge in foreclosures in the suburbs, then, reflects the spreading of the foreclosure crisis to the overall economy, thereby impacting holders of conventional loans. Model 2, which includes interaction terms for year and location, has negative hazard ratios for years 2010 through 2012, which in this model are to be interpreted as the annual effects for properties located in Detroit's strong neighborhoods. Interaction terms for entry year and location are positive and significant for each year in inner-ring suburbs, with the hazard ratios climbing from a negligible 1.09 in 2007 to 1.77 in 2012. A similar pattern is observed in outer-ring suburbs, with coefficients climbing from 1.10 in 2009 to 1.61 in 2012.

With regard to the hazard ratios for the dummy variables capturing each combination of entry year, seller, and location, the annual values for Fannie Mae and Freddie Mac are quite consistent across location. The two GSEs possess statistically significant and positive values, with the exception of the term for Freddie Mac's 2013 foreclosures in inner-ring suburbs. The hazard ratios for Fannie Mae and Freddie Mac are at their highest, all above 2.0, across locations in 2010, corresponding to the national peak in REO starts for the enterprises in that year (with the single exception that the largest value for Freddie Mac is for 2009). The hazard ratios for HUD are generally significant and less than 1, with the exception of some values above 1 in 2005 and 2006, when HUD sales were relatively scarce. The results for the covariates for property- and neighborhood-level characteristics are quite similar to those of the Detroit-only model, the primary difference being the positive effect of assessed value on time-to-sale.

8.4 Discussion

During the mortgage foreclosure crisis, federal and private entities alike repossessed vast numbers of residential properties. Previous research indicates the sudden growth of these entities' inventories created pressure to rapidly shed properties from inventory, par-

ticularly lower-valued properties in central-city, majority-minority neighborhoods (Coulton et al., 2008; Immergluck, 2012; Y. S. Lee & Immergluck, 2012). This research contributes to the small literature on the pace of REO sales by examining the determinants of time-to-sale across several years, including both the peak years of the foreclosure crisis and the start of the housing market recovery. The findings here are largely congruent with past research, particularly in the finding of an acceleration of the pace of REO sales though 2009 and substantial supply-side effects on time-to-sale. I find the two GSEs to be strongly associated with a rapid increase in time-to-sale during the years in which they absorbed the largest amount of inventory, 2009 though 2012, which lags roughly two-to-three years behind the period during which private entities absorbed and disposed of their largest numbers. Thus, at least in the Detroit metropolitan area, it appears there were two overlapping, but staggered waves of rapid property disposition, first by private entities, second by the GSEs. This claim finds support elsewhere in this dissertation, where I discuss the timing and nature of bulk sales in Detroit.

It is important to note, however, that rapid sales do not necessarily equate to investor purchases, particularly after 2009 when First Look programs were launched, providing local governments, eligible nonprofits, and prospective homebuyers a limited window to bid on foreclosures owned by federal entities and participating private entities, free from competition from investors. Rapid sales times then might reflect parties taking advantage of this program, though this is impossible to ascertain from available data. Figure 8.2 offers a simple visualization of the relationship between buyer type and entry year. It shows the median number of days between foreclosure and sale for each category of buyer by the year in which properties were foreclosed. It shows that the median days between foreclosure and sale for individuals did indeed cross over the line for large investors between 2008 and 2009, with individuals purchasing properties that entered REO in 2009 after a shorter period of time than large investors. Investors of other sizes, however, had lower median days between foreclosure and sale for every year except for 2011.

Ownership by HUD, unlike the GSEs, is associated with substantially slower sales times, particularly prior to 2010. Starting in 2010, however, HUD is linked to a slight increase in the rate of sales relative to private entities, although the differences are so small as to be practically insignificant. Looking at low-valued properties alone, however, the magnitude of the differences between HUD and private entities increases considerably, with properties entering HUD's inventory in 2012 being predicted to sell 45% more quickly than those entering private inventory that year, although still at a slower rate than either of the GSEs. Based on interviews and government audits of HUD's sales performance (U.S. Government Accountability Office, 2013), I suspect this shift between very slow sales times and more rapid sales times is a function of early difficulties HUD encountered in receiving properties from servicers after foreclosure. This likely created a significant backlog of inventory waiting to be received by HUD. Once HUD took possession of these properties, HUD likely experienced pressure to rapidly dispose of its inventory, particularly its holdings of low-value properties. This idea is reinforced by the number of bulk transactions HUD made in Detroit, including the sale of roughly 200 homes to Ron Mackie between 2010 and 2013 (see Table 7.2).

Another contribution of this research is a nuanced examination of the pace of foreclosure sales across metropolitan space over an expansive time period. I find substantial differences in the pace of REO sales across space and time, reflecting different patterns of foreclosures between central city and suburban locations. While the pace of sales slowed overall in Detroit after 2009, it began to climb rather sharply in suburban locations during this period, as the subprime mortgage crisis penetrated the overall economy and higher-income households and holders of conventional mortgages began to experience foreclosure. Above and beyond these somewhat diverging annual trends for central-city and suburban locations, properties owned by the GSEs are associated with a more rapid sales time between 2010 and 2012, across all locations. Sales times for HUD are also largely negative relative to times for private entities in a given location. The faster pace of sales

in suburban locations, particularly in the outer suburbs, I would argue, stems less from the the GSE's desire to shed properties in these locations at fire-sale prices—indeed, REO sale prices in these locations are far higher than those in the City of Detroit—but rather from stronger demand from prospective owner-occupants and individual investors for properties in those locations.

Previous research on the pace of REO sales was motivated by a concern over the rapid channeling of foreclosures to investors, thereby precluding local governments and non-profits from purchasing these homes using NSP funding and putting them to productive use. Further. the rapid sale of concentrated foreclosure is linked to vacancy and blight. Faster sale times are generally interpreted as indicative of property dumping, and, therefore, negative. Slower sales times, on the other hand, are viewed as reflecting owners' decisions to incur higher carrying costs and set higher prices. In other words, longer sales times are viewed as emblematic of greater interest in a given property. As discussed above, however, slower sales times are also a function of federal entities', specifically HUD's, procedural difficulties in receiving properties from servicers after foreclosure. Properties sitting longer on the market, particularly in places like Detroit, are highly susceptible to deterioration. In these instances, longer sale times might lead to equally low sales prices, and generally only speculators are willing to purchase such properties, as they likely require significant improvements. This scenario is highly likely for HUD, which has a policy of *not* repairing properties prior to sale (U.S. Government Accountability Office, 2013). The next chapter takes up this issue through its examination of the impact on home sale prices of nearby foreclosures based on their duration in inventory.o

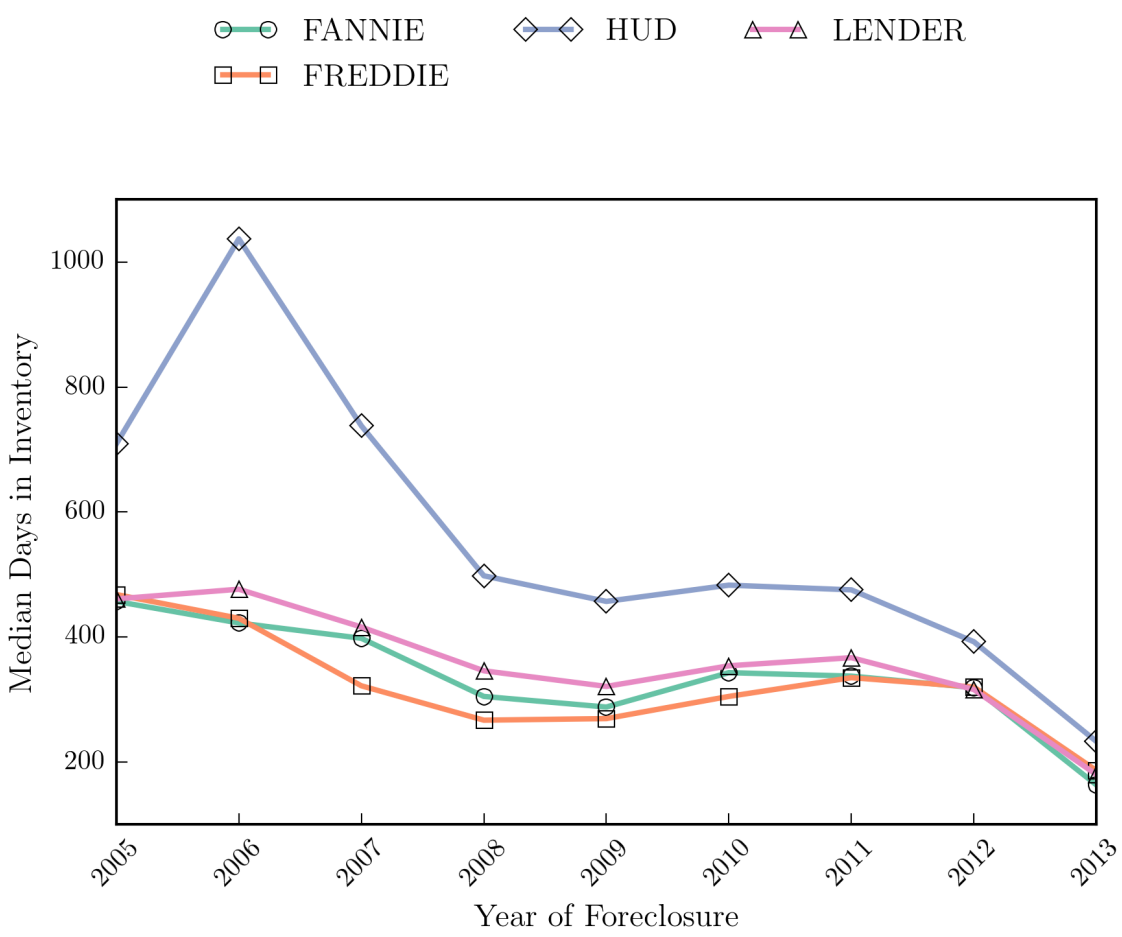

Figure 8.1: Median Days between Foreclosure and Sale, Detroit, 2006–2013. Sources: CoreLogic (2010, 2014).

Table 8.1: Hazard Ratios for Proportional Hazards Model of Time-to-Sale in Detroit 2005–2013

	Dependent variable:		
	survival_time		
	Detroit	Strong	Outer
	(1)	(2)	(3)
FANNIE2005	1.052 (0.051)	1.027 (0.065)	1.107 (0.083)
FANNIE2006	1.362*** (0.041)	1.321*** (0.053)	1.462*** (0.066)
FANNIE2007	1.201*** (0.036)	1.137*** (0.045)	1.324*** (0.058)
FANNIE2008	1.622*** (0.030)	1.552*** (0.037)	1.763*** (0.052)
FANNIE2009	2.067*** (0.037)	2.141*** (0.045)	2.014*** (0.065)
FANNIE2010	2.429*** (0.038)	2.539*** (0.046)	2.195*** (0.068)
FANNIE2011	1.763*** (0.043)	1.806*** (0.051)	1.655*** (0.079)

FANNIE2012	2.158*** (0.054)	2.350*** (0.065)	1.792*** (0.097)
FANNIE2013	1.011 (0.133)	0.825 (0.169)	1.431 (0.222)
FREDDIE2005	1.052 (0.100)	1.115 (0.132)	0.977 (0.153)
FREDDIE2006	1.353*** (0.084)	1.397*** (0.102)	1.287* (0.147)
FREDDIE2007	2.104*** (0.065)	2.053*** (0.079)	2.229*** (0.117)
FREDDIE2008	1.936*** (0.050)	1.699*** (0.059)	3.110*** (0.095)
FREDDIE2009	2.456*** (0.066)	2.638*** (0.075)	1.847*** (0.143)
FREDDIE2010	2.089*** (0.095)	2.129*** (0.103)	1.961** (0.273)
FREDDIE2011	1.784*** (0.098)	1.828*** (0.106)	1.439 (0.274)
FREDDIE2012	2.610*** (0.069)	2.884*** (0.080)	2.026*** (0.138)
FREDDIE2013	1.075 (0.170)	1.085 (0.196)	1.037 (0.340)
HUD2005	0.434*** (0.040)	0.447*** (0.048)	0.403*** (0.076)
HUD2006	0.362*** (0.034)	0.369*** (0.040)	0.357*** (0.062)
HUD2007	0.392*** (0.031)	0.391*** (0.037)	0.397*** (0.060)
HUD2008	0.549*** (0.030)	0.541*** (0.035)	0.567*** (0.059)
HUD2009	0.921** (0.038)	0.862*** (0.044)	1.058 (0.072)
HUD2010	1.080* (0.041)	1.092* (0.049)	1.055 (0.080)
HUD2011	1.106** (0.051)	1.074 (0.059)	1.214** (0.098)
HUD2012	1.142* (0.068)	1.198** (0.080)	1.017 (0.136)
HUD2013	0.579 (0.363)	0.237** (0.586)	3.588*** (0.474)
shd_year2006	0.962* (0.020)	0.944** (0.026)	0.989 (0.031)
shd_year2007	1.267*** (0.019)	1.287*** (0.025)	1.246*** (0.030)
shd_year2008	1.504*** (0.023)	1.597*** (0.031)	1.382*** (0.038)
shd_year2009	0.969 (0.038)	1.139*** (0.050)	0.757*** (0.063)
shd_year2010	0.638*** (0.042)	0.697*** (0.057)	0.586*** (0.070)
shd_year2011	0.702*** (0.044)	0.787*** (0.059)	0.617*** (0.074)
shd_year2012	0.682*** (0.050)	0.716*** (0.066)	0.699*** (0.084)
shd_year2013	1.348*** (0.090)	1.555*** (0.110)	1.124 (0.166)
SHDspat_lag5k_ln_zgm	1.020* (0.011)	1.065*** (0.018)	0.978 (0.016)
X_norm	0.911*** (0.023)	0.930** (0.031)	0.901*** (0.037)
Y_norm	0.925* (0.042)	0.910* (0.057)	0.862* (0.078)
lat.2	0.928 (0.124)	0.921 (0.142)	0.925 (0.417)
long.2	1.028 (0.084)	1.068 (0.113)	0.908 (0.160)
latXlong	1.205 (0.155)	0.934 (0.195)	1.385 (0.337)
med_hm_val_zgm	1.006 (0.010)	0.993 (0.013)	1.021 (0.018)
pov_rate_zgm	0.978** (0.009)	0.989 (0.013)	1.010 (0.018)
own_occ_zgm	1.056*** (0.010)	1.060*** (0.013)	1.025 (0.016)
med_hh_inc_zgm	0.950*** (0.013)	0.951*** (0.016)	0.986 (0.033)
assessed_val_ln_zgm	1.001 (0.005)	1.001 (0.006)	0.998 (0.009)
floor_area_ln_zgm	0.971*** (0.006)	0.965*** (0.008)	0.978** (0.009)
Observations	54,627	36,002	18,625
R^2	0.130	0.142	0.114
Max. Possible R^2	1.000	1.000	1.000
Log Likelihood	−493,865.800	−310,056.200	−151,605.200

Wald Test (df = 47)	7,259.380***	5,267.220***	2,157.200***
LR Test (df = 47)	7,632.176***	5,518.174***	2,245.249***
Score (Logrank) Test (df = 47)	7,798.619***	5,676.615***	2,335.767***

*p<0.1; **p<0.05; ***p<0.01

Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 8.2: Hazard Ratios for Proportional Hazards Model of Time-to-Sale in Detroit Low-Value Properties 2005–2013

	Dependent variable:		
	survival_time		
	Detroit	Strong	Outer
	(1)	(2)	(3)
FANNIE2005	1.158 (0.103)	1.016 (0.198)	1.234* (0.121)
FANNIE2006	1.566*** (0.090)	1.602** (0.190)	1.589*** (0.103)
FANNIE2007	1.417*** (0.080)	1.391* (0.176)	1.446*** (0.090)
FANNIE2008	1.544*** (0.061)	1.284** (0.106)	1.733*** (0.075)
FANNIE2009	1.816*** (0.077)	1.676*** (0.129)	1.901*** (0.097)
FANNIE2010	2.469*** (0.071)	2.794*** (0.111)	2.236*** (0.092)
FANNIE2011	1.820*** (0.067)	1.929*** (0.094)	1.680*** (0.096)
FANNIE2012	1.907*** (0.087)	2.167*** (0.126)	1.706*** (0.120)
FANNIE2013	1.043 (0.214)	0.702 (0.345)	1.402 (0.286)
FREDDIE2005	1.105 (0.211)	1.313 (0.506)	1.041 (0.233)
FREDDIE2006	1.229 (0.215)	1.752 (0.504)	1.179 (0.237)
FREDDIE2007	2.008*** (0.156)	2.851*** (0.321)	1.857*** (0.179)
FREDDIE2008	2.388*** (0.102)	1.590*** (0.172)	3.299*** (0.127)
FREDDIE2009	2.116*** (0.172)	3.912*** (0.244)	1.417 (0.246)
FREDDIE2010	1.440 (0.310)	1.395 (0.371)	1.823 (0.583)
FREDDIE2011	1.797*** (0.200)	2.314*** (0.236)	1.079 (0.386)
FREDDIE2012	2.659*** (0.116)	3.167*** (0.158)	2.225*** (0.173)
FREDDIE2013	0.988 (0.302)	0.641 (0.450)	1.568 (0.411)
HUD2005	0.379*** (0.111)	0.407*** (0.188)	0.368*** (0.138)
HUD2006	0.355*** (0.095)	0.347*** (0.172)	0.355*** (0.114)
HUD2007	0.398*** (0.090)	0.420*** (0.155)	0.383*** (0.111)
HUD2008	0.539*** (0.071)	0.525*** (0.103)	0.533*** (0.099)
HUD2009	0.937 (0.086)	0.770** (0.133)	1.011 (0.115)
HUD2010	1.139* (0.079)	1.270** (0.116)	1.028 (0.114)
HUD2011	1.226** (0.080)	1.217* (0.106)	1.290** (0.123)
HUD2012	1.295** (0.110)	1.450** (0.149)	1.170 (0.168)
HUD2013	1.169 (0.432)	0.223 (1.018)	5.504*** (0.494)
shd_year2006	0.992 (0.041)	0.997 (0.087)	0.989 (0.046)

shd_year2007	1.188*** (0.040)	1.179** (0.083)	1.191*** (0.045)
shd_year2008	1.432*** (0.047)	1.642*** (0.094)	1.336*** (0.056)
shd_year2009	0.902 (0.075)	1.280* (0.147)	0.761*** (0.091)
shd_year2010	0.542*** (0.078)	0.568*** (0.151)	0.546*** (0.095)
shd_year2011	0.593*** (0.074)	0.642*** (0.140)	0.594*** (0.095)
shd_year2012	0.603*** (0.084)	0.585*** (0.155)	0.647*** (0.107)
shd_year2013	1.032 (0.152)	1.228 (0.230)	0.895 (0.219)
SHDspat_lag5k_ln_zgm	0.988 (0.018)	1.036 (0.043)	0.964* (0.021)
X_norm	0.939 (0.047)	1.032 (0.091)	0.879** (0.060)
Y_norm	0.848* (0.086)	0.823 (0.157)	0.884 (0.128)
lat.2	0.973 (0.215)	0.863 (0.296)	1.478 (0.551)
long.2	0.889 (0.185)	0.453** (0.327)	1.376 (0.242)
latXlong	0.970 (0.340)	1.087 (0.583)	1.173 (0.563)
med_hm_val_zgm	0.989 (0.018)	0.983 (0.031)	0.982 (0.026)
pov_rate_zgm	0.998 (0.020)	0.982 (0.040)	0.983 (0.027)
own_occ_zgm	1.035* (0.019)	1.033 (0.042)	1.031 (0.023)
med_hh_inc	1.000 (0.00000)	1.000 (0.00000)	1.000 (0.00000)
assessed_val_ln_zgm	0.996 (0.009)	1.001 (0.013)	0.993 (0.014)
floor_area_ln_zgm	0.958*** (0.010)	0.906*** (0.019)	0.982 (0.013)
Observations	13,655	5,034	8,621
R^2	0.107	0.127	0.104
Max. Possible R^2	1.000	1.000	1.000
Log Likelihood	−101,001.400	−30,981.370	−62,332.370
Wald Test (df = 47)	1,489.460***	676.110***	934.150***
LR Test (df = 47)	1,540.304***	686.553***	947.953***
Score (Logrank) Test (df = 47)	1,590.972***	726.795***	1,014.763***

*p<0.1; **p<0.05; ***p<0.01

Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 8.3: Hazard Ratios for Proportional Hazards Model of Time-to-Sale in Detroit Tri-County Area 2005–2013

	Dependent variable:	
	survival_time	
	(1)	(2)
FANNIE_det2005	6.958*** (0.180)	6.316*** (0.181)
FANNIE_det2006	1.580*** (0.067)	1.438*** (0.068)
FANNIE_det2007	1.355*** (0.050)	1.295*** (0.051)
FANNIE_det2008	1.468*** (0.037)	1.380*** (0.038)
FANNIE_det2009	1.681*** (0.034)	1.603*** (0.035)

FANNIE_det2010	2.643*** (0.031)	2.639*** (0.033)
FANNIE_det2011	1.714*** (0.029)	1.851*** (0.032)
FANNIE_det2012	1.353*** (0.032)	1.565*** (0.034)
FANNIE_det2013	1.050 (0.040)	1.293*** (0.042)
FANNIE_inner2005	6.073*** (0.170)	6.829*** (0.170)
FANNIE_inner2006	1.527*** (0.054)	1.705*** (0.056)
FANNIE_inner2007	1.627*** (0.038)	1.712*** (0.039)
FANNIE_inner2008	1.317*** (0.028)	1.379*** (0.029)
FANNIE_inner2009	1.383*** (0.023)	1.375*** (0.024)
FANNIE_inner2010	2.641*** (0.020)	2.626*** (0.021)
FANNIE_inner2011	1.838*** (0.019)	1.800*** (0.020)
FANNIE_inner2012	1.315*** (0.020)	1.271*** (0.021)
FANNIE_inner2013	1.038 (0.025)	0.989 (0.025)
FANNIE_outer2005	7.326*** (0.193)	7.292*** (0.195)
FANNIE_outer2006	1.775*** (0.072)	1.758*** (0.076)
FANNIE_outer2007	1.875*** (0.044)	1.841*** (0.046)
FANNIE_outer2008	1.432*** (0.031)	1.453*** (0.033)
FANNIE_outer2009	1.249*** (0.025)	1.318*** (0.026)
FANNIE_outer2010	2.224*** (0.023)	2.254*** (0.024)
FANNIE_outer2011	1.691*** (0.021)	1.667*** (0.022)
FANNIE_outer2012	1.164*** (0.022)	1.125*** (0.023)
FANNIE_outer2013	0.878*** (0.028)	0.828*** (0.029)
FREDDIE_det2005	7.525*** (0.354)	6.878*** (0.354)
FREDDIE_det2006	2.183*** (0.141)	1.990*** (0.141)
FREDDIE_det2007	1.635*** (0.087)	1.561*** (0.087)
FREDDIE_det2008	2.640*** (0.061)	2.490*** (0.061)
FREDDIE_det2009	2.323*** (0.060)	2.233*** (0.061)
FREDDIE_det2010	2.233*** (0.074)	2.231*** (0.075)
FREDDIE_det2011	1.871*** (0.094)	1.995*** (0.095)
FREDDIE_det2012	1.962*** (0.081)	2.328*** (0.082)
FREDDIE_det2013	1.351*** (0.063)	1.758*** (0.066)
FREDDIE_inner2005	5.081*** (0.172)	5.714*** (0.173)
FREDDIE_inner2006	2.143*** (0.080)	2.387*** (0.081)
FREDDIE_inner2007	2.025*** (0.056)	2.145*** (0.056)
FREDDIE_inner2008	2.122*** (0.040)	2.215*** (0.040)
FREDDIE_inner2009	1.947*** (0.033)	1.930*** (0.034)
FREDDIE_inner2010	2.442*** (0.028)	2.427*** (0.029)
FREDDIE_inner2011	1.964*** (0.026)	1.927*** (0.027)
FREDDIE_inner2012	1.380*** (0.028)	1.334*** (0.029)
FREDDIE_inner2013	1.045 (0.034)	0.993 (0.034)
FREDDIE_outer2005	8.918*** (0.183)	8.850*** (0.185)
FREDDIE_outer2006	2.834*** (0.107)	2.806*** (0.110)
FREDDIE_outer2007	2.080*** (0.061)	2.043*** (0.062)
FREDDIE_outer2008	2.032*** (0.039)	2.062*** (0.040)
FREDDIE_outer2009	1.824*** (0.034)	1.930*** (0.034)

FREDDIE_outer2010	2.349*** (0.028)	2.379*** (0.029)
FREDDIE_outer2011	1.821*** (0.027)	1.798*** (0.028)
FREDDIE_outer2012	1.195*** (0.029)	1.154*** (0.030)
FREDDIE_outer2013	0.875*** (0.036)	0.821*** (0.037)
HUD_det2005	3.763*** (0.354)	3.389*** (0.354)
HUD_det2006	0.955 (0.072)	0.864** (0.074)
HUD_det2007	0.704*** (0.088)	0.646*** (0.089)
HUD_det2008	0.506*** (0.063)	0.482*** (0.063)
HUD_det2009	0.486*** (0.024)	0.461*** (0.024)
HUD_det2010	0.625*** (0.030)	0.602*** (0.030)
HUD_det2011	0.755*** (0.034)	0.771*** (0.035)
HUD_det2012	0.621*** (0.038)	0.684*** (0.039)
HUD_det2013	0.545*** (0.040)	0.639*** (0.042)
HUD_inner2005	3.691*** (0.183)	4.152*** (0.184)
HUD_inner2006	1.126** (0.055)	1.263*** (0.057)
HUD_inner2007	0.767*** (0.050)	0.830*** (0.051)
HUD_inner2008	0.550*** (0.038)	0.577*** (0.039)
HUD_inner2009	0.523*** (0.021)	0.537*** (0.021)
HUD_inner2010	0.819*** (0.025)	0.815*** (0.026)
HUD_inner2011	0.915*** (0.026)	0.901*** (0.026)
HUD_inner2012	0.689*** (0.025)	0.669*** (0.026)
HUD_inner2013	0.713*** (0.027)	0.679*** (0.028)
HUD_outer2005	2.953*** (0.354)	2.939*** (0.355)
HUD_outer2006	1.241** (0.106)	1.231* (0.109)
HUD_outer2007	0.913 (0.088)	0.897 (0.089)
HUD_outer2008	0.586*** (0.060)	0.582*** (0.061)
HUD_outer2009	0.560*** (0.038)	0.575*** (0.039)
HUD_outer2010	0.854*** (0.043)	0.879*** (0.043)
HUD_outer2011	0.922* (0.044)	0.915** (0.045)
HUD_outer2012	0.638*** (0.038)	0.621*** (0.039)
HUD_outer2013	0.677*** (0.040)	0.638*** (0.040)
shd_year2006	0.991 (0.015)	0.917*** (0.023)
shd_year2007	1.193*** (0.015)	1.163*** (0.022)
shd_year2008	1.392*** (0.015)	1.301*** (0.024)
shd_year2009	1.118*** (0.017)	0.992 (0.030)
shd_year2010	0.984 (0.017)	0.790*** (0.030)
shd_year2011	1.276*** (0.017)	0.941* (0.031)
shd_year2012	1.402*** (0.018)	0.933** (0.032)
shd_year2013	1.624*** (0.019)	1.503*** (0.036)
new_clust1	1.156*** (0.011)	0.932** (0.030)
new_clust2	1.192*** (0.014)	1.087** (0.037)
SHDspat_lag5k_ln_zgm	0.992* (0.005)	0.981*** (0.005)
county_cat1	1.025*** (0.008)	1.026*** (0.008)
county_cat2	0.992 (0.008)	0.994 (0.008)
med_hm_val_zgm	1.005 (0.007)	1.006 (0.007)

pov_rate_zgm	0.970*** (0.004)	0.970*** (0.004)
own_occ_zgm	1.004 (0.004)	1.003 (0.004)
med_hh_inc_zgm	0.975*** (0.008)	0.976*** (0.008)
assessed_val_ln_zgm	1.008* (0.004)	1.016*** (0.004)
floor_area_ln_zgm	0.933*** (0.004)	0.932*** (0.004)
shd_year2006:new_clust1		1.170*** (0.034)
shd_year2007:new_clust1		1.088** (0.033)
shd_year2008:new_clust1		1.223*** (0.034)
shd_year2009:new_clust1		1.253*** (0.038)
shd_year2010:new_clust1		1.414*** (0.038)
shd_year2011:new_clust1		1.559*** (0.039)
shd_year2012:new_clust1		1.769*** (0.040)
shd_year2013:new_clust1		1.224*** (0.045)
shd_year2006:new_clust2		1.100** (0.041)
shd_year2007:new_clust2		1.003 (0.040)
shd_year2008:new_clust2		0.988 (0.041)
shd_year2009:new_clust2		1.103** (0.044)
shd_year2010:new_clust2		1.249*** (0.044)
shd_year2011:new_clust2		1.393*** (0.045)
shd_year2012:new_clust2		1.605*** (0.046)
shd_year2013:new_clust2		1.013 (0.051)
Observations	157,559	157,559
R^2	0.123	0.125
Max. Possible R^2	1.000	1.000
Log Likelihood	−1,676,663.000	−1,676,437.000
Wald Test	20,952.490*** (df = 100)	21,376.910*** (df = 116)
LR Test	20,666.990*** (df = 100)	21,118.750*** (df = 116)
Score (Logrank) Test	22,179.700*** (df = 100)	22,635.650*** (df = 116)

*p<0.1; **p<0.05; ***p<0.01

Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Figure 8.2: Median Days between Foreclosure and Sale, Detroit, 200–2013. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

CHAPTER IX

Spillovers of Current and Former REO Properties

The foreclosure crisis resulted in a massive number of home foreclosures in cities and metropolitan areas across the U.S. Foreclosed properties often sit vacant and susceptible to deterioration and vandalism, which, in turn, can discount the sale price of nearby homes. Previous research has largely confirmed this relationship, finding evidence of sizable negative externalities generated by foreclosures (Harding et al., 2009; Ihlanfeldt & Mayock, 2014; Immergluck & Smith, 2006a; Schuetz et al., 2008). A number of these studies examine the relationship between the duration of foreclosure—i.e., the length of time between foreclosure and sale—and nearby home sale prices, but the relationship between the specific institutions owning REOs and nearby home price discounts is unknown. These differences, however, can effect the REO durations, as shown in Chapter VIII, as well as maintenance levels and type of buyer, as shown in Chapter VI. This chapter addresses this gap in the literature by examining the impact of ownership by federal and private entities on home sale prices, taking into account the length of time properties have been in REO inventory. The GSEs, HUD, and private entities each have separate infrastructures for handling properties. The GSEs' systems are characterized in government audits by a relative degree of standardization and centralization, particularly in comparison to HUD, which only takes control of properties after lengthy procedural difficulties working with servicers to convey properties (U.S. Government Accountability Office, 2013).

HUD has also been charged with poor oversight of contractors responsible for property preservation, increasing the possibility of unsold, vacant HUD-owned properties harming nearby home sale prices (U.S. Department of Housing and Urban Development. Office of Inspector General, 2012). Private entities exhibit variation in terms of the standardization of their procedures for maintaining and marketing properties, but several reports have found private entities poorly maintain properties in inner-city neighborhoods (Dane, Ramchandani, & Bellows, 2013–2014; National Fair Housing Alliance, 2014a).

In addition to testing for the impact of the type of institution owning a given foreclosure on nearby home prices, I also examine the potential spillover effects of properties after they exit REO status. Further, I distinguish between former REO properties purchased by individuals and properties purchased by investors. Ihlanfeldt and Mayock (2014), in their study of spillovers in several Florida counties, found that properties purchased by investors produced a short-term negative spillover, while properties purchased by individuals appeared to have no effect on nearby home values. In the Detroit, context, where investor activity is pervasive and frequently speculative, it is likely investor purchases impose long-term negative spillover effects.

9.1 Literature Review

Prior studies have not examined the possibility of REO spillovers being mediated by the type of institution responsible for them, i.e., ownership by a federal or private entity, and only one other study has considered differences in spillovers between former REOs purchased by investors and those purchased by homeowners (Ihlanfeldt & Mayock, 2014). Further, prior research has not adequatly considered differences between central-city and suburban locations in terms of these impacts (Kobie & Lee, 2011). There are, however, a number of recent studies of the impact of nearby foreclosures on home sale prices. Taken as whole, these studies find that foreclosures impose negative externalities that diminish with distance and time. As research on this topic has grown, so too has the sophistication

of analytical strategies used to estimate the direct effects of foreclosure on property values. In addition, researchers have paid increasing attention to differences in the externalities imposed by foreclosures based on where properties stand in relation to the foreclosure process.

One of the earliest and most influential studies of this issue was conducted by Immergluck and Smith (2006a). To test their hypothesis that foreclosures—by leading to vacancy and deterioration—impact nearby property values, the authors employed a hedonic model to regress the sale price of single-family residential properties in 1999 in Chicago on the number of nearby foreclosure filings—used as a proxy for completed foreclosures—and a battery of property- and neighborhood-level covariates. To estimate the distance-decay of the effect of proximate foreclosures, the authors constructed two variables of central interest: the number of foreclosure filings occurring within an eighth of a mile and the number of filings occurring within one quarter of a mile, all issued in the two years prior to the year of sale. The authors created two separate count variables for each of these two distances: the number of filings on conventional mortgages and the number of filings on government-insured mortgages. Based on their results, the authors estimated that each additional foreclosure of a conventional mortgage occurring within an eighth of a mile is associated with 0.9% reduction in sale price. After controlling for the number of foreclosures located within one eighth of a mile of a given sale, foreclosures occurring between one eighth and one quarter of a mile were not predicted to have an impact on home values. Filings on government-insured mortgages were not found to have an impact at any distance. While subsequent studies' findings are largely consistent with those of Immergluck and Smith (2006a), some key methodological limitations have been identified. Since Immergluck and Smith (2006a) examine property values at just one point in time, the authors are unable to control for localized trends in home prices. As foreclosures are more prevalent where neighborhood property values are lower, the failure to account for localized trends raises the prospect of an endogeneity problem. Further, this study captures

just the immediate effect of a foreclosure filing, which could possibility differ over time.

Schuetz et al. (2008) addressed the limitations of cross-sectional studies of foreclosure-related externalities in their research on the impact of foreclosure filings on home sale prices in New York City between 2000 and 2005. The authors identify foreclosure filings near sales of non-distressed residential properties and sort them based on time and distance thresholds, specifically, for each time period of, first, 0 to 18 months prior and, second, 18 or more months prior, the authors count the number of filings occurring within 0 to 250 feet, 250 to 500 feet, and 500 to 1,000 feet of a given home sale. The authors employed a hedonic model regressing sale prices on these time- and distance-based indicators of the number of nearby foreclosure filings on home sale prices, as well as a battery of property characteristics and spatial-temporal fixed effects. To account for the possible non-linear impact of the number of nearby foreclosures and home sale prices, the authors regressed home sale prices not only on the count of nearby filings, but also on dummy variables indicating different intervals of foreclosure counts. The authors found evidence of a threshold effect, whereby a small number of nearby foreclosures may not depress home values, but a large number may have a substantial impact. The authors also found that foreclosure-related externalities linger beyond 18 months, suggesting these impacts last beyond foreclosure completion or sale.

Subsequent studies furnish additional evidence that price discounts depend on the status of a given property with regard to the foreclosure process and that they persist through time. Lin et al. (2007), in their study of home sale prices in Chicago in 2003 and 2006, estimated an additional nearby foreclosure occurring within two years would depress 2006 sale prices by nearly 9%.[1] While the impact of foreclosures diminished after two years, spillovers persisted up to five years. Harding et al. (2009), who used a repeat sales method to study spillovers in seven metro areas, found that the largest discounts

[1]Nearby sale prices were less impacted by foreclosures in 2003, indicating the importance of housing cycles in predicting foreclosure-related externalities. The very high estimate of spillovers in 2006 is likely due to the study's failure to control for local home price trends.

were imposed by nearby properties that were in the phase of foreclosure three months prior to the foreclosure sale. They estimated each additional property situated at this point in the foreclosure processes located within 300 feet of a non-distressed sale decreased the price by 1.2%. The authors additionally found that the price discount stabilized for properties that were between foreclosure sale and REO sale, but persisted a year beyond the REO sale. Kobie and Lee (2011), in their study of Cuyahoga County, Ohio, found that price discounts attributable to nearby foreclosures were greatest for properties that had experienced a completed foreclosure auction (Sheriff's sale) within the two years prior to sale. Kobie and Lee (2011) were also the first to compare spillovers in central city and suburban areas, as most prior studies examined entire counties or MSAs. The authors found that spillovers were larger in the suburbs than in Cleveland, with each additional Sheriff's sale on the same block face as a sale imposing a discount of 3% in the suburbs and 2% in the city. The authors also found that properties that had been in the foreclosure process for at least 360 days created spillovers, but only in the suburbs.

While a number of studies consider the impact of pre-foreclosures and REOs on home prices, there are very few that examine spillovers generated after the REO sale. As noted above, Harding et al. (2009) found that spillovers persisted more than a year after sale. Ihlanfeldt and Mayock (2014), in a study of 10 large counties in Florida, offer the only study of differences between former REOs purchased by investors and homeowners in terms of the spillovers they generate. The authors found both current REOs and former REOs sold to investors were found to depress nearby property values, but the negative impact of investor-purchased REOs was found to fall below the impact of existing rental properties within three years. Former REOs purchased by owner-occupants did not create a discount. The authors attribute these findings to owner-occupants' acquisition of properties in better overall condition and their greater likelihood of making rapid and substantial improvements compared to investors (Rohe & Stewart, 1996). On the other hand, the authors argue, investor acquisitions are not be feared as much as thought given their smaller

impact on property values relative to existing rental units. A yet smaller number of studies examines the relationship between categories of REO buyers and subsequent property conditions, which have the potential to impact nearby home values. Looking at REOs in Boston, Hwang (2015) found that REOs purchased by owner-occupants were less likely to be linked to code violations and property condition related service requests than those purchased by investors.

This chapter extends the literature on foreclosure-related externalities by separately testing for spillovers generated by REOs owned by the GSEs, HUD and private entities. As previous research indicates, externalities are more likely to be generated by REOs than pre-foreclosures. REOs are nearly always vacant, and when they are inadequately secured and maintained they can create a stigma effect harming nearby home values. Federal and private entities have separate systems for maintaining and marketing REOs with potentially different consequences for the susceptibility of their inventory to deterioration. The GSEs have more streamlined systems for managing and marketing their inventory than HUD and the they also have stronger tools for overseeing contractors (U.S. Government Accountability Office, 2013; U.S. Department of Housing and Urban Development. Office of Inspector General & Federal Housing Finance Agency. Office of Inspector General, 2013). As shown in the previous chapter, properties remain in HUD's inventory for longer intervals due to procedural delays in transferring foreclosed FHA-insured properties to HUD, increasing their susceptibility to deterioration. Thus, spillovers generated by HUD-owned properties might increase the longer they have been in inventory. In addition to current REOs, I test for spillovers generated by former REOs, sorting them into those purchased by investors and those purchased by homeowners. A large share of investors in REO properties, particularly in Detroit and places like it, are speculators seeking to flip properties or rent them without making improvements. These properties are thus quite likely to generate negative spillovers. Properties purchased by homeowners are much likely to be occupied and regularly maintained, thus reducing their likelihood

of discounting nearby home prices. A number of studies examining the share of REOs acquired by investors in recent years are predicated on the assumption investor acquisition, in the aggregate, is likely harmful to neighborhoods (Kim & Cho, 2016; McMillan & Chakraborty, 2016; Pfeiffer & Molina, 2013). This chapter puts this assumption to the test.

9.2 Analytic Strategy

To estimate the impact of current and former REO properties on the value of nearby residential properties, I employ several hedonic models regressing home sale prices on a series of terms measuring the number of current and former REOs occurring within one eight of a mile and within one eighth and one quarter of a mile, as well as a series of property- and neighborhood-level control variables. Following Immergluck and Smith (2006a), I use distance bands of zero to one-eighth of a mile and one-eighth to one-quarter of a mile of a given property in counting the number of current and former REOS. Current REOs are sorted into those that have been in REO fewer than 365 days, and those that have been in REO 365 or more days. Former REOs are sorted into those exited REO fewer than 365 days from the date of home sale (0 to 1 year), those that exited between 365 and 729 days (1 to 2 years), those that exited between 730 and 1,094 days (2 to 3 years), and those that exited for any longer period of time (3 or more years). In addition, I fit the model with a series of control variables for property- and neighborhood-level characteristics, including census tract-year fixed effects. I estimated hedonic regression models for both Detroit and the Detroit metropolitan areas. I have grouped Fannie Mae and Freddie Mac together given the smaller number of properties handled by Freddie and the difficulties this presents for estimating parameters using regression analysis.

It is important to note, however, that this approach is limited by a selection problem, wherein it is impossible for me to fully account for differences in the properties repossessed by federal agencies and private entities and subsequently purchased by investors or owner-occupants. My control variables are limited to general property characteristics

and spatial coordinates, which means that I lack fine-grained information about individual properties that might influence whether or not they enter the inventory of one entity or another or are purchased by investors or homeowners. For example, I lack data on property conditions and outstanding liens, both of which influence buyers' decisions. These factors could plausibly explain externalities for some properties, not the nature of the party that owned them.

9.3 Detroit-Only Model

I obtained home sale data from the CoreLogic data grant. I include only arm's length home sales valued between $500 and $800,000 located in Detroit's strong neighborhoods. I derive counts of REOs adjacent to home sales from my Detroit-only REO database. Data needed for the property level covariates were derived from the City of Detroit Assessor data. Table 9.1 presents descriptive statistics for the count variables of nearby current and former REOs. This table shows that the count variables have larger values in the outer distance-band, between one-eighth and one-quarter mile. They also show the number of nearby REOs in inventory longer than one year is significantly less than the the number of nearby REOs in inventory less than one year, with more properties having larger numbers of nearby REOs owned by HUD for more than one year than nearby REOs owned by the GSEs for more than one year. The descriptives also indicate many variables are heavily right-skewed.

Table 9.2 presents the results of the hedonic regression where the count variables of current and former REOs are the variables of interest. Among REOs active for fewer than 12 months, no variables possess negative coefficients, while the variables for the count of REOs within one-eighth mile owned by HUD and the GSEs are positive and significant, although quite small in magnitude. The coefficient for nearby properties owned by the GSEs for under a year may be interpreted as indicating each additional property owned by the GSEs in the first distance-band increases sale prices by 1%, while the comparable

value for HUD is only 0.5% and just 0.1% for privately owned REOs. These coefficients suggest that nearby properties recently conveyed to the GSEs exert a modest protective effect, which is likely due to these properties having recently been cleaned and secured. As expected, the effect diminishes with distance; none of the variables in the second distance band are significant. REOs that have been in inventory for more than 12 months, however, impose a larger discount on sale prices, with HUD-owned homes imposing the greatest discount. Older REOs private inventories impose the largest discount after HUD, but only in the nearest distance-band, indicating a more localized contagion effect for those properties compared to HUD's older inventory. Properties in the GSEs' inventories longer than 13 months also impose a localized discount, though considerably less so than either HUD or private entities. This potentially could reflect the smaller number of properties remaining in the GSEs' inventory after 12 months, but it also seems likely that the GSEs' unsold inventory declined in condition at a slower rate than other homes due to greater oversight of contractors responsible for property preservation.

Turning to the coefficients for former REOs purchased by owner-occupants, the number of nearby properties purchased within 12 months of a given home sale generate a positive spillover in both distance bands. Nearby properties purchased between one and two years prior to a given home sale have a similar impact. Properties purchased by owner-occupants between two and three years prior to a home sale continue to have a positive impact, though the spillover is much smaller. Properties purchased by individuals three or more years prior have no impact on home prices. These findings suggest nearby properties recently purchased by owner-occupants have the greatest positive impact on home prices. The diminished influence of properties purchased by owner-occupants three or more years after sale may also reflect the fact that these sales are necessarily concentrated in the later years of the study period, when home prices declined at a less precipitous rate.

Nearby former REOs purchased by investors 12 or fewer months before a given home sale—and located in the second distance band, i.e., between one-eighth and one-quarter

mile—are predicted to impose a modest discount. The coefficient for investor-owned properties purchased 12 or fewer months before a given home sale, but located in the nearest distance band, e.g., within one-eighth mile, however, is not significant. This is likely a function of the larger average number of properties in this category in the second distance band. Properties purchased by investors between one and two years prior to a nearby non-distressed sale do not impact sale prices, but those owned for two or more years impose a discount, with the greatest discount imposed by nearby properties purchased 3 or more years prior to sale. Taken as a whole, the coefficients for former REOs purchased by investors indicate these properties impose a greater discount with time, likely as properties purchased by flippers, milkers, and other types of speculators suffer an increasing amount of deterioration due to deferred maintenance, vacancy, and neglect.

The model including the counts of current and former REOs possesses the advantage that coefficients can be interpreted as the marginal effect of an additional current or former REO within the two distance bands. It seeks unlikely, however, that each additional foreclosure would have the same effect, i.e., intuition and prior research suggests impacts may be non-linear (Schuetz et al., 2008). Further, the data are highly skewed, challenging the assumption of linearity required for OLS regression. Following Schuetz et al. (2008), therefore, I estimate two additional regression models: one indicating the simple presence or absence of nearby current or former REOs, and a second model grouping counts of current and former REOs into classes roughly corresponding to "few" or "more" REOs.

Table 9.6 shows the results of the model including simple indicators of presence or absence of nearby REOs. As seen in the table, using dummy variables generates both more and less intuitive results, specifically with regard to the relative size of coefficients for each of the two distance bands. For REOs active for less than 12 months, the size of the coefficients in the one-eighth to one-quarter mile band are all substantially larger than those in the one-eight mile range. This reflects the much larger number of properties at a greater distance from most home sales, and is consistent with coefficients obtained

by Schuetz et al. (2008). The coefficients for active REOs owned for 12 or more months are more intuitive, with larger coefficients for closer properties. Among former REOs, properties purchased by both individuals and investors within one year of a given home sale are positively associated with home values. Properties owned by investors between one and three years impose an increasingly negative discount, while properties owned by investors for three or more years are not associated with a discount. This may reflect the fact that investor-acquired properties are less harmful as they may have been sold to a more responsible party, passed into public ownership, or demolished. Properties purchased between one and two years prior by an owner-occupant continue to have a positive effect on home values, but those owned between two and three years impose a discount, though it is less than half the discount imposed by investors.

Table 9.4 presents the results of the model including the counts of "few" and "more" nearby current and former REOs. The definition of few and more differs based on distance. "Few" properties in the closed distance band equals 1–2 properties, while "more" means 3 or more. "Few" in the second distance band equals 1–5 properties, while "more" refers to 6 or more. These results provide modest evidence of non-linear effects, with the indicators for "more" properties having substantially larger coefficients than those for "few," with a few instances of "more" variables being significant were the corresponding "few" variables are not. For example, "few" REOs in GSE inventory 12 months or less and within one-eighth mile is not significant, while the coefficient for "more" is highly significant. Active REOs in HUD inventory more than 12 months continue to impose the strongest discount in this model as well, with HUD and private entities exhibiting a strong non-linear effect in the nearest distance band. HUD alone, however, continues to impose discounts in the outer distance-band after controlling for nearby REOs. The coefficients for former REOs continue to show that REOs acquired by investors between two and three years prior to a nearby home sale impose the most significant discounts.

9.4 Regional Model

To examine the impact of current and former REOs on home prices across the Detroit tri-county area, I applied the same set of models to REO and non-distressed home sales using the RealtyTrac data for Detroit's strong neighborhoods and inner- outer-ring suburbs. These results are presented in Tables 9.5, 9.6, and 9.7. The key finding here is that spillovers are larger in suburban locations, particularly the outer-ring suburbs. This is consistent with prior research arguing central-city housing markets in places like Detroit have internalized occurrences like foreclosure (Kobie & Lee, 2011). In the outer suburbs, the estimated discount imposed by each additional HUD-owned property within one-eighth mile is roughly 5.5%, which is a substantial penalty (see Table 9.5). The corresponding values for Detroit and the inner-ring suburbs are far smaller. It is important to note, however, that there are far fewer FHA-insured properties and HUD-owned homes in the outer-ring suburbs than in the other two locations, suggesting that while the penalties imposed by nearby HUD homes in the outer suburbs may be high, they are also likely idiosyncratic and a reflection of the difficulties of fitting a linear relationship between the count of nearby HUD homes and nearby sale prices. These wide differences between the outer suburbs and the other two locations persist, however, in the models estimating the non-linear impact of REOs on home prices (See Tables 9.6 and 9.7). The coefficients for the disaggregated non-linear model suggest that the impact of just one to two nearby homes that have been in HUD's inventory for over 12 months impose roughly the same discounts as any number of HUD homes in the outer suburbs. In Detroit's strong neighborhoods and the inner-ring suburbs, however, discounts appear to mount after only a certain number of HUD properties are present, indicating a threshold effect (cf., Schuetz et al., 2008). With regard to former REOs, the coefficients for nearby REOs owned by investors are generally significant across locations and models.

Table 9.1: Descriptive Statistics for Count Variables of Nearby REOs for Sales in Detroit's Strong Neighborhoods

Variable	Description	Min	Max	Mean	Std. Dev.
active_01_hud_near	Count of HUD-owned REOs in inventory 0-1 months within 1/8th mile	0	40	5.64	5.51
active_01_hud_far	Count of HUD-owned REOs in inventory 0–12 months between 1/8th and 1/4th mile	0	95	14.81	13.68
active_01_gse_near	Count of GSE-owned REOs in inventory 0-1 months within 1/8th mile	0	36	8.40	5.91
active_01_gse_far	Count of GSE-owned REOs in inventory 0–12 months between 1/8th and 1/4th mile	0	85	21.87	14.06
active_01_lender_near	Count of Lender-owned REOs in inventory 0-1 months within 1/8th mile	0	87	15.32	13.89
active_01_lender_far	Count of Lender-owned REOs in inventory 0–12 months between 1/8th and 1/4th mile	0	199	39.96	35.25
active_12_hud_near	Count of HUD-owned REOs in inventory 13+ months within 1/8th mile	0	14	0.97	1.38
active_12_hud_far	Count of HUD-owned REOs in inventory 13+ months between 1/8th and 1/4th mile	0	28	2.41	2.92
active_12_gse_near	Count of GSE-owned REOs in inventory 13+ months within 1/8th mile	0	6	0.34	0.65
active_12_gse_far	Count of GSE-owned REOs in inventory 13+ months between 1/8th and 1/4th mile	0	11	0.80	1.13

active_12_lender_near	Count of Lender-owned REOs in inventory 13+ months within 1/8th mile	0	23	1.91	1.96
active_12_lender_far	Count of Lender-owned REOs in inventory 13+ months between 1/8th and 1/4th mile	0	39	4.84	4.08
former_01_individuals_near	Count of individual-owned REOs in inventory 0–1 years within 1/8th mile	0	15	1.56	1.84
former_01_individuals_far	Count of individual-owned REOs in inventory 0–12 years between 1/8th and 1/4th mile	0	36	4.12	4.06
former_01_investors_near	Count of investor-owned REOs in inventory 0–1 years within 1/8th mile	0	38	3.56	4.02
former_01_investors_far	Count of investor-owned REOs in inventory 0–12 years between 1/8th and 1/4th mile	0	71	9.28	9.79
former_12_individuals_near	Count of individual-owned REOs in inventory 1–2 years within 1/8th mile	0	15	1.32	1.77
former_12_individuals_far	Count of individual-owned REOs in inventory 1–2 years between 1/8th and 1/4th mile	0	37	3.47	3.96
former_12_investors_near	Count of investor-owned REOs in inventory 1–2 years within 1/8th mile	0	36	2.88	3.71
former_12_investors_far	Count of investor-owned REOs in inventory 1–2 years between 1/8th and 1/4th mile	0	71	7.58	9.07
former_23_individuals_near	Count of individual-owned REOs in inventory 2–3 years within 1/8th mile	0	15	1.13	1.73
former_23_individuals_far	Count of individual-owned REOs in inventory 2–3 years between 1/8th and 1/4th mile	0	34	2.98	3.97

former_23_investors_near	Count of investor-owned REOs in inventory 2–3 years within 1/8th mile	0	32	2.43	3.57
former_23_investors_far	Count of investor-owned REOs in inventory 2–3 years between 1/8th and 1/4th mile	0	70	6.39	8.77
former_3plus_individuals_near	Count of individual-owned REOs in inventory 3+ years within 1/8th mile	0	41	2.36	4.22
former_3plus_individuals_far	Count of individual-owned REOs in inventory 3+ years between 1/8th and 1/4th mile	0	91	6.20	10.57
former_3plus_investors_near	Count of investor-owned REOs in inventory 3+ years within 1/8th mile	0	81	6.25	10.72
former_3plus_investors_far	Count of investor-owned REOs in inventory 3+ years between 1/8th and 1/4th mile	0	166	16.44	27.49
transaction_amount	NaN	500	735,000	43,071.17	47,324.68

Note: Census tract fixed effects not shown. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 9.2: Estimated Linear Impact of REOs on Nearby Sale Prices in Detroit's Strong Neighborhoods

	Dependent variable:
	price_ln
active_01_hud_near	0.005^{***} (0.001)
active_01_hud_far	0.001 (0.001)
active_01_gse_near	0.010^{***} (0.001)
active_01_gse_far	0.002^{*} (0.001)
active_01_lender_near	0.001^{*} (0.001)
active_01_lender_far	0.001 (0.0004)
active_12_hud_near	-0.034^{***} (0.004)
active_12_hud_far	-0.011^{***} (0.003)
active_12_gse_near	-0.013^{*} (0.008)
active_12_gse_far	0.005 (0.005)
active_12_lender_near	-0.028^{***} (0.003)
active_12_lender_far	0.004^{**} (0.002)
former_01_individuals_near	0.016^{***} (0.003)
former_01_individuals_far	0.008^{***} (0.002)
former_01_investors_near	−0.002 (0.002)
former_01_investors_far	-0.010^{***} (0.001)
former_12_individuals_near	0.014^{***} (0.003)
former_12_individuals_far	0.012^{***} (0.002)
former_12_investors_near	−0.003 (0.002)
former_12_investors_far	−0.001 (0.001)
former_23_individuals_near	0.008^{**} (0.004)
former_23_individuals_far	0.007^{**} (0.003)
former_23_investors_near	-0.006^{**} (0.002)
former_23_investors_far	−0.001 (0.001)
former_3plus_individuals_near	0.003 (0.003)
former_3plus_individuals_far	0.002 (0.002)
former_3plus_investors_near	-0.013^{***} (0.001)
former_3plus_investors_far	-0.005^{***} (0.001)
floor_area_ln_zgm	0.187^{***} (0.006)
lot_size_ln_zgm	0.059^{***} (0.005)
age_cat2	0.188^{***} (0.014)
age_cat3	0.170^{***} (0.015)
age_cat4	0.226^{***} (0.016)
age_cat5	0.213^{***} (0.035)
age_cat6	0.189 (0.129)
season_cat2	-0.071^{***} (0.011)
season_cat3	-0.060^{***} (0.013)
season_cat4	-0.445^{***} (0.017)
Observations	60,340

R^2	0.713
Adjusted R^2	0.709
Residual Std. Error	0.783 (df = 59366)
	*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 9.3: Estimated Non-Linear Impact of REOs on Nearby Sale Prices in Detroit's Strong Neighborhoods

	Dependent variable:
	price_ln
active_01_hud_near_any	0.051^{***} (0.017)
active_01_hud_far_any	0.062^{***} (0.023)
active_01_gse_near_any	0.027 (0.025)
active_01_gse_far_any	0.049 (0.052)
active_01_lender_near_any	−0.009 (0.024)
active_01_lender_far_any	−0.044 (0.047)
active_12_hud_near_any	-0.044^{***} (0.010)
active_12_hud_far_any	-0.019^{*} (0.011)
active_12_gse_near_any	-0.040^{***} (0.010)
active_12_gse_far_any	−0.006 (0.010)
active_12_lender_near_any	-0.062^{***} (0.011)
active_12_lender_far_any	0.022 (0.016)
former_01_individuals_near_any	0.036^{***} (0.010)
former_01_individuals_far_any	0.089^{***} (0.012)
former_01_investors_near_any	0.086^{***} (0.012)
former_01_investors_far_any	0.124^{***} (0.015)
former_12_individuals_near_any	0.024^{**} (0.012)
former_12_individuals_far_any	0.014 (0.016)
former_12_investors_near_any	-0.037^{***} (0.014)
former_12_investors_far_any	−0.001 (0.018)
former_23_individuals_near_any	-0.041^{***} (0.014)
former_23_individuals_far_any	−0.018 (0.019)
former_23_investors_near_any	-0.097^{***} (0.018)
former_23_investors_far_any	-0.193^{***} (0.027)
former_3plus_individuals_near_any	0.010 (0.021)
former_3plus_individuals_far_any	0.014 (0.022)
former_3plus_investors_near_any	0.001 (0.025)
former_3plus_investors_far_any	−0.039 (0.028)
floor_area_ln_zgm	0.197^{***} (0.006)
lot_size_ln_zgm	0.063^{***} (0.005)

age_cat2	0.203*** (0.014)
age_cat3	0.185*** (0.015)
age_cat4	0.245*** (0.017)
age_cat5	0.217*** (0.035)
age_cat6	0.213* (0.127)
season_cat2	−0.087*** (0.012)
season_cat3	−0.084*** (0.014)
season_cat4	−0.497*** (0.019)
Observations	60,340
R^2	0.709
Adjusted R^2	0.705
Residual Std. Error	0.789 (df = 59366)
	*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 9.4: Estimated Disaggregated Non-Linear Impact of REOs on Nearby Sale Prices in Detroit's Strong Neighborhoods

	Dependent variable:
	price_ln
active_01_hud_near_1to2	0.032* (0.017)
active_01_hud_near_3plus	0.102*** (0.020)
active_01_hud_far_1to5	0.060*** (0.023)
active_01_hud_far_6plus	0.151*** (0.029)
active_01_gse_near_1to2	0.015 (0.025)
active_01_gse_near_3plus	0.076*** (0.029)
active_01_gse_far_1to5	0.059 (0.051)
active_01_gse_far_6plus	0.091 (0.056)
active_01_lender_near_1to2	−0.009 (0.025)
active_01_lender_near_3plus	0.016 (0.027)
active_01_lender_far_1to5	−0.028 (0.047)
active_01_lender_far_6plus	−0.005 (0.050)
active_12_hud_near_1to2	−0.034*** (0.010)
active_12_hud_near_3plus	−0.131*** (0.018)
active_12_hud_far_1to5	−0.024** (0.011)
active_12_hud_far_6plus	−0.067*** (0.020)
active_12_gse_near_1to2	−0.037*** (0.010)
active_12_gse_near_3plus	−0.016 (0.035)
active_12_gse_far_1to5	−0.0003 (0.010)
active_12_gse_far_6plus	0.029 (0.070)
active_12_lender_near_1to2	−0.040*** (0.011)

active_12_lender_near_3plus	−0.118*** (0.014)
active_12_lender_far_1to5	0.015 (0.015)
active_12_lender_far_6plus	−0.019 (0.019)
former_01_individuals_near_1to2	0.029*** (0.010)
former_01_individuals_near_3plus	0.063*** (0.015)
former_01_individuals_far_1to5	0.083*** (0.012)
former_01_individuals_far_6plus	0.101*** (0.018)
former_01_investors_near_1to2	0.075*** (0.012)
former_01_investors_near_3plus	0.105*** (0.015)
former_01_investors_far_1to5	0.113*** (0.014)
former_01_investors_far_6plus	0.122*** (0.019)
former_12_individuals_near_1to2	0.022* (0.012)
former_12_individuals_near_3plus	0.047*** (0.016)
former_12_individuals_far_1to5	0.018 (0.016)
former_12_individuals_far_6plus	0.063*** (0.021)
former_12_investors_near_1to2	−0.029** (0.014)
former_12_investors_near_3plus	−0.058*** (0.018)
former_12_investors_far_1to5	−0.003 (0.018)
former_12_investors_far_6plus	−0.050** (0.023)
former_23_individuals_near_1to2	−0.041*** (0.014)
former_23_individuals_near_3plus	−0.025 (0.019)
former_23_individuals_far_1to5	−0.013 (0.019)
former_23_individuals_far_6plus	−0.016 (0.025)
former_23_investors_near_1to2	−0.083*** (0.018)
former_23_investors_near_3plus	−0.125*** (0.022)
former_23_investors_far_1to5	−0.179*** (0.027)
former_23_investors_far_6plus	−0.227*** (0.032)
former_3plus_individuals_near_1to2	0.015 (0.021)
former_3plus_individuals_near_3plus	−0.051** (0.024)
former_3plus_individuals_far_1to5	0.005 (0.022)
former_3plus_individuals_far_6plus	−0.062** (0.031)
former_3plus_investors_near_1to2	0.013 (0.024)
former_3plus_investors_near_3plus	−0.062* (0.032)
former_3plus_investors_far_1to5	−0.040 (0.027)
former_3plus_investors_far_6plus	−0.040 (0.036)
floor_area_ln_zgm	0.195*** (0.006)
lot_size_ln_zgm	0.061*** (0.005)
age_cat2	0.198*** (0.014)
age_cat3	0.181*** (0.015)
age_cat4	0.238*** (0.017)
age_cat5	0.216*** (0.035)
age_cat6	0.214* (0.128)
season_cat2	−0.078*** (0.012)
season_cat3	−0.066*** (0.014)

season_cat4	-0.460^{***} (0.019)
Observations	60,340
R^2	0.712
Adjusted R^2	0.707
Residual Std. Error	0.786 (df = 59338)
	*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: City of Detroit Assessor (2014), CoreLogic (2010), Wayne County Register of Deeds (2014).

Table 9.5: Estimated Linear Impact of REOs on Nearby Sale Prices in Detroit's Strong Neighborhoods and Inner- and Outer-Ring Suburbs

	Dependent variable:		
	price_ln		
	Strong Tracts	Inner-Ring	Outer-Ring
	(1)	(2)	(3)
active_01_hud_near	0.002** (0.001)	−0.002*** (0.001)	−0.017*** (0.003)
active_01_hud_far	0.001 (0.001)	−0.002*** (0.0004)	−0.0003 (0.002)
active_01_gse_near	0.004*** (0.001)	−0.001*** (0.0004)	−0.006*** (0.001)
active_01_gse_far	0.001** (0.0005)	−0.0002 (0.0003)	0.001 (0.001)
active_01_lender_near	0.0004 (0.0005)	0.001*** (0.0004)	−0.001 (0.002)
active_01_lender_far	0.001** (0.0003)	0.001*** (0.0002)	0.001 (0.001)
active_12_hud_near	−0.015*** (0.003)	−0.014*** (0.003)	−0.054*** (0.016)
active_12_hud_far	−0.003 (0.002)	−0.013*** (0.002)	−0.041*** (0.011)
active_12_gse_near	0.002 (0.005)	−0.006* (0.003)	0.008 (0.010)
active_12_gse_far	0.003 (0.004)	0.001 (0.002)	0.001 (0.007)
active_12_lender_near	−0.004** (0.002)	−0.009*** (0.002)	−0.015* (0.009)
active_12_lender_far	−0.002 (0.001)	−0.004*** (0.002)	−0.005 (0.006)
former_01_individuals_near	0.001 (0.002)	−0.002** (0.001)	−0.012*** (0.003)
former_01_individuals_far	0.002 (0.001)	−0.0002 (0.001)	−0.006*** (0.002)
former_01_investors_near	−0.005*** (0.001)	−0.007*** (0.001)	−0.025*** (0.004)
former_01_investors_far	−0.005*** (0.001)	−0.004*** (0.001)	−0.013*** (0.003)
former_12_individuals_near	−0.001 (0.002)	−0.0002 (0.001)	−0.007** (0.003)
former_12_individuals_far	0.001 (0.001)	−0.00002 (0.001)	−0.006** (0.002)
former_12_investors_near	−0.005*** (0.001)	−0.005*** (0.001)	−0.019*** (0.005)
former_12_investors_far	−0.003*** (0.001)	−0.004*** (0.001)	−0.007** (0.003)
former_23_individuals_near	0.001 (0.002)	−0.002 (0.001)	−0.005 (0.003)
former_23_individuals_far	0.001 (0.001)	−0.001 (0.001)	0.002 (0.002)

former_23_investors_near	−0.005*** (0.001)	−0.007*** (0.001)	−0.029*** (0.006)
former_23_investors_far	−0.002*** (0.001)	−0.003*** (0.001)	−0.012*** (0.003)
former_3plus_individuals_near	0.004*** (0.001)	0.003*** (0.001)	−0.001 (0.003)
former_3plus_individuals_far	0.004*** (0.001)	0.004*** (0.001)	0.006*** (0.002)
former_3plus_investors_near	−0.0004 (0.001)	−0.002*** (0.001)	−0.017*** (0.004)
former_3plus_investors_far	0.0003 (0.0004)	−0.001 (0.001)	−0.006* (0.003)
floor_area_ln_zgm	0.189*** (0.010)	0.277*** (0.004)	0.291*** (0.005)
lot_size_ln_zgm	0.156*** (0.017)	0.073*** (0.005)	0.045*** (0.003)
age_cat2	0.151*** (0.014)	0.058*** (0.009)	0.014 (0.016)
age_cat3	0.137*** (0.015)	0.145*** (0.008)	0.048*** (0.013)
age_cat4	0.172*** (0.017)	0.284*** (0.008)	0.154*** (0.012)
age_cat5	0.196*** (0.035)	0.353*** (0.010)	0.263*** (0.013)
age_cat6	0.161** (0.065)	0.379*** (0.013)	0.381*** (0.013)
season_cat2	0.008 (0.010)	0.047*** (0.004)	0.050*** (0.005)
season_cat3	0.025** (0.012)	0.030*** (0.005)	0.042*** (0.006)
season_cat4	−0.036** (0.014)	0.009 (0.006)	0.031*** (0.006)
Observations	52,374	134,437	111,137
R^2	0.543	0.725	0.677
Adjusted R^2	0.534	0.718	0.666
Residual Std. Error	0.725 (df = 51409)	0.471 (df = 131160)	0.441 (df = 107548)
			*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: RealtyTrac (2015b)

Table 9.6: Estimated Non-Linear Impact of REOs on Nearby Sale Prices in Detroit's Strong Neighborhoods and Inner- and Outer-Ring Suburbs

	Dependent variable:		
	price_ln		
	Strong Tracts	Inner-Ring	Outer-Ring
	(1)	(2)	(3)
active_01_hud_near_any	0.012 (0.013)	−0.034*** (0.004)	−0.040*** (0.005)
active_01_hud_far_any	−0.022 (0.025)	−0.052*** (0.006)	−0.021*** (0.005)
active_01_gse_near_any	−0.026 (0.027)	−0.020*** (0.006)	−0.019*** (0.004)
active_01_gse_far_any	−0.043 (0.072)	−0.023** (0.011)	−0.014*** (0.005)
active_01_lender_near_any	0.013 (0.022)	−0.004 (0.005)	−0.011*** (0.004)
active_01_lender_far_any	0.088 (0.082)	−0.007 (0.008)	−0.002 (0.005)
active_12_hud_near_any	−0.028*** (0.010)	−0.032*** (0.005)	−0.066*** (0.017)
active_12_hud_far_any	−0.010 (0.012)	−0.025*** (0.005)	−0.044*** (0.012)
active_12_gse_near_any	−0.005 (0.011)	−0.014*** (0.005)	0.009 (0.010)
active_12_gse_far_any	0.004 (0.010)	−0.001 (0.004)	0.001 (0.008)
active_12_lender_near_any	0.007 (0.010)	−0.025*** (0.004)	−0.022** (0.009)
active_12_lender_far_any	0.013 (0.021)	−0.017*** (0.004)	−0.005 (0.006)
former_01_individuals_near_any	−0.004 (0.010)	−0.012*** (0.004)	−0.019*** (0.004)
former_01_individuals_far_any	0.018 (0.013)	−0.004 (0.006)	−0.008** (0.004)
former_01_investors_near_any	−0.006 (0.013)	−0.036*** (0.004)	−0.037*** (0.006)
former_01_investors_far_any	−0.012 (0.015)	−0.019*** (0.005)	−0.019*** (0.005)
former_12_individuals_near_any	0.006 (0.010)	−0.005 (0.004)	−0.010** (0.004)
former_12_individuals_far_any	−0.015 (0.023)	−0.016*** (0.006)	−0.010** (0.004)
former_12_investors_near_any	−0.096*** (0.015)	−0.042*** (0.005)	−0.033*** (0.006)
former_12_investors_far_any	−0.066** (0.030)	−0.028*** (0.005)	−0.015*** (0.005)
former_23_individuals_near_any	−0.003 (0.011)	−0.017*** (0.005)	−0.013*** (0.005)
former_23_individuals_far_any	−0.091*** (0.018)	−0.020*** (0.006)	0.003 (0.004)

former_23_investors_near_any	−0.074*** (0.016)	−0.046*** (0.005)	−0.036*** (0.007)
former_23_investors_far_any	−0.208*** (0.026)	−0.043*** (0.006)	−0.028*** (0.006)
former_3plus_individuals_near_any	−0.011 (0.016)	−0.002 (0.006)	−0.011** (0.005)
former_3plus_individuals_far_any	−0.068*** (0.021)	−0.005 (0.008)	0.009 (0.006)
former_3plus_investors_near_any	−0.004 (0.021)	−0.020*** (0.006)	−0.024*** (0.007)
former_3plus_investors_far_any	−0.113*** (0.023)	−0.021*** (0.007)	−0.016*** (0.006)
floor_area_ln_zgm	0.193*** (0.010)	0.275*** (0.004)	0.289*** (0.005)
lot_size_ln_zgm	0.159*** (0.016)	0.066*** (0.005)	0.041*** (0.003)
age_cat2	0.161*** (0.014)	0.061*** (0.009)	0.016 (0.016)
age_cat3	0.141*** (0.015)	0.146*** (0.008)	0.049*** (0.013)
age_cat4	0.174*** (0.017)	0.290*** (0.008)	0.158*** (0.012)
age_cat5	0.187*** (0.035)	0.356*** (0.010)	0.264*** (0.013)
age_cat6	0.170*** (0.064)	0.378*** (0.012)	0.380*** (0.013)
season_cat2	0.024** (0.010)	0.052*** (0.004)	0.050*** (0.005)
season_cat3	0.055*** (0.012)	0.040*** (0.005)	0.042*** (0.006)
season_cat4	0.010 (0.015)	0.022*** (0.006)	0.031*** (0.006)
Observations	52,374	134,437	111,137
R^2	0.541	0.725	0.677
Adjusted R^2	0.532	0.718	0.666
Residual Std. Error	0.727 (df = 51409)	0.471 (df = 131160)	0.441 (df = 107548)
			*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: RealtyTrac (2015b)

Table 9.7: Estimated Non-Linear Impact of REOs on Nearby Sale Prices in Detroit's Strong Neighborhoods and Inner- and Outer-Ring Suburbs

	Dependent variable:		
	price_ln		
	Strong Tracts	Inner-Ring	Outer-Ring
	(1)	(2)	(3)
active_01_hud_near_1to2	0.014 (0.014)	−0.023*** (0.005)	−0.037*** (0.005)
active_01_hud_near_3plus	0.021 (0.015)	−0.036*** (0.005)	−0.079*** (0.012)
active_01_hud_far_1to5	−0.015 (0.025)	−0.046*** (0.006)	−0.023*** (0.005)
active_01_hud_far_6plus	−0.018 (0.028)	−0.068*** (0.008)	0.006 (0.015)
active_01_gse_near_1to2	−0.023 (0.028)	−0.009 (0.006)	−0.019*** (0.004)
active_01_gse_near_3plus	−0.014 (0.028)	−0.026*** (0.007)	−0.025*** (0.006)
active_01_gse_far_1to5	−0.036 (0.073)	−0.023** (0.011)	−0.015*** (0.005)
active_01_gse_far_6plus	−0.047 (0.077)	−0.056*** (0.012)	0.003 (0.007)
active_01_lender_near_1to2	0.028 (0.024)	−0.0001 (0.006)	−0.010*** (0.004)
active_01_lender_near_3plus	0.008 (0.024)	0.001 (0.006)	−0.012* (0.006)
active_01_lender_far_1to5	0.090 (0.081)	−0.006 (0.008)	−0.002 (0.005)
active_01_lender_far_6plus	0.125 (0.083)	0.014 (0.010)	0.002 (0.008)
active_12_hud_near_1to2	−0.015 (0.010)	−0.020*** (0.005)	−0.064*** (0.017)
active_12_hud_near_3plus	−0.055*** (0.014)	−0.061*** (0.012)	−0.067*** (0.019)
active_12_hud_far_1to5	−0.005 (0.012)	−0.017*** (0.005)	−0.045*** (0.012)
active_12_hud_far_6plus	−0.030* (0.018)	−0.095*** (0.015)	
active_12_gse_near_1to2	−0.003 (0.011)	−0.011** (0.005)	0.008 (0.010)
active_12_gse_near_3plus	−0.006 (0.023)	−0.012 (0.016)	0.353*** (0.021)
active_12_gse_far_1to5	0.007 (0.010)	0.002 (0.004)	0.0001 (0.008)
active_12_gse_far_6plus	−0.003 (0.035)	0.046* (0.027)	
active_12_lender_near_1to2	0.018* (0.011)	−0.018*** (0.004)	−0.021** (0.009)
active_12_lender_near_3plus	0.003 (0.011)	−0.031*** (0.010)	−0.041 (0.089)

active_12_lender_far_1to5	0.019 (0.021)	−0.013*** (0.004)	−0.004 (0.006)
active_12_lender_far_6plus	0.012 (0.022)	−0.005 (0.012)	−0.254*** (0.013)
former_01_individuals_near_1to2	−0.004 (0.010)	−0.006 (0.004)	−0.019*** (0.004)
former_01_individuals_near_3plus	0.004 (0.012)	−0.014*** (0.005)	−0.011 (0.014)
former_01_individuals_far_1to5	0.021 (0.013)	−0.002 (0.006)	−0.009** (0.004)
former_01_individuals_far_6plus	0.026* (0.016)	−0.010 (0.007)	−0.014 (0.024)
former_01_investors_near_1to2	0.006 (0.013)	−0.019*** (0.004)	−0.034*** (0.006)
former_01_investors_near_3plus	−0.008 (0.014)	−0.053*** (0.005)	−0.096*** (0.025)
former_01_investors_far_1to5	−0.012 (0.015)	−0.016*** (0.005)	−0.020*** (0.005)
former_01_investors_far_6plus	−0.048** (0.020)	−0.042*** (0.007)	−0.098*** (0.035)
former_12_individuals_near_1to2	0.017 (0.011)	−0.001 (0.004)	−0.010** (0.004)
former_12_individuals_near_3plus	0.001 (0.012)	−0.002 (0.005)	0.001 (0.014)
former_12_individuals_far_1to5	−0.009 (0.023)	−0.014** (0.006)	−0.010** (0.004)
former_12_individuals_far_6plus	−0.006 (0.025)	−0.006 (0.008)	−0.021 (0.026)
former_12_investors_near_1to2	−0.060*** (0.016)	−0.025*** (0.005)	−0.029*** (0.006)
former_12_investors_near_3plus	−0.102*** (0.016)	−0.054*** (0.006)	−0.075*** (0.025)
former_12_investors_far_1to5	−0.050* (0.030)	−0.024*** (0.005)	−0.015*** (0.005)
former_12_investors_far_6plus	−0.113*** (0.033)	−0.057*** (0.008)	−0.007 (0.039)
former_23_individuals_near_1to2	−0.007 (0.012)	−0.011** (0.005)	−0.012** (0.005)
former_23_individuals_near_3plus	0.017 (0.013)	−0.015*** (0.006)	0.0002 (0.016)
former_23_individuals_far_1to5	−0.077*** (0.019)	−0.016** (0.006)	0.003 (0.004)
former_23_individuals_far_6plus	−0.049** (0.021)	−0.017** (0.008)	0.036 (0.022)
former_23_investors_near_1to2	−0.050*** (0.018)	−0.027*** (0.005)	−0.031*** (0.007)
former_23_investors_near_3plus	−0.074*** (0.018)	−0.061*** (0.007)	−0.129*** (0.028)
former_23_investors_far_1to5	−0.185*** (0.026)	−0.037*** (0.006)	−0.028*** (0.006)
former_23_investors_far_6plus	−0.243*** (0.030)	−0.059*** (0.009)	−0.087** (0.040)
former_3plus_individuals_near_1to2	−0.019 (0.017)	0.001 (0.006)	−0.013** (0.005)
former_3plus_individuals_near_3plus	0.016 (0.019)	0.011 (0.007)	0.006 (0.011)
former_3plus_individuals_far_1to5	−0.059*** (0.021)	0.0003 (0.008)	0.008 (0.006)
former_3plus_individuals_far_6plus	−0.034 (0.027)	0.022** (0.010)	0.035*** (0.013)

former_3plus_investors_near_1to2	0.013 (0.023)	−0.008 (0.006)	−0.022*** (0.007)
former_3plus_investors_near_3plus	−0.022 (0.024)	−0.027*** (0.007)	−0.061*** (0.019)
former_3plus_investors_far_1to5	−0.100*** (0.023)	−0.015** (0.007)	−0.017*** (0.006)
former_3plus_investors_far_6plus	−0.104*** (0.031)	−0.018* (0.010)	−0.053** (0.026)
floor_area_ln_zgm	0.192*** (0.010)	0.273*** (0.004)	0.289*** (0.005)
lot_size_ln_zgm	0.153*** (0.016)	0.061*** (0.005)	0.041*** (0.003)
age_cat2	0.160*** (0.014)	0.061*** (0.009)	0.014 (0.016)
age_cat3	0.142*** (0.015)	0.147*** (0.008)	0.048*** (0.013)
age_cat4	0.170*** (0.017)	0.288*** (0.008)	0.156*** (0.012)
age_cat5	0.185*** (0.035)	0.352*** (0.009)	0.263*** (0.013)
age_cat6	0.164*** (0.063)	0.376*** (0.012)	0.379*** (0.013)
season_cat2	0.022** (0.010)	0.050*** (0.004)	0.050*** (0.005)
season_cat3	0.053*** (0.013)	0.036*** (0.005)	0.042*** (0.006)
season_cat4	0.009 (0.016)	0.016*** (0.006)	0.031*** (0.006)
Observations	52,374	134,437	111,137
R^2	0.542	0.726	0.677
Adjusted R^2	0.533	0.719	0.666
Residual Std. Error	0.726 (df = 51381)	0.470 (df = 131132)	0.440 (df = 107522)
			*p<0.1; **p<0.05; ***p<0.01

Note: Census tract fixed effects not shown. Sources: RealtyTrac (2015b)

CHAPTER X

Conclusions and Policy Implications

In the preceding chapters I examined the post-foreclosure trajectory of REO properties in Detroit and the Detroit tri-county area from 2005 to 2013, a period that covers the peak of the foreclosure crisis and its immediate aftermath. During this time, a substantial number of properties were foreclosed and placed in REO inventory. These properties were concentrated in Detroit's middle- and working-class neighborhoods, several of which possessed strong or stable demand for housing in the years immediately preceding the foreclosure crisis. While abundant research exists linking foreclosure to negative neighborhood outcomes (see Chapter I), few studies have considered the role of the entities responsible for these properties in influencing whether foreclosures are more or less likely to contribute to neighborhood decline. Federal entities, specifically, HUD and the GSEs, were responsible for large numbers of REOs during this period. These entities possessed twin, yet potentially contradictory mandates to (1) regain their financial footing after sustaining substantial losses and (2) promote homeownership and stabilize the nation's hardest-hit neighborhoods. Put differently, federal entities had mandates to simultaneously view their REO holdings through an aggregate, portfolio perspective, and a neighborhood perspective that explicitly takes space into consideration. I examined the degree to which what happened with properties passing through federal entities' portfolios was more or less likely to promote the second objective, that of neighborhood preser-

vation, relative to outcomes for properties passing through the inventories of lenders and servicers. A central assumption of this research is that private entities acted to maximize their aggregate, portfolio-level returns. Given the massive accumulation of REOs and the overcapacity of private entities' disposition infrastructures, private entities are assumed to have rapidly disposed of inventory in markets where prospects for home price appreciation were limited, as found in prior research in Cleveland and Atlanta (Ford et al., 2013; Immergluck, 2012). Federal entities, on the other hand, either possessed or later adopted a number of programs and procedures intended to support homeownership and neighborhoods with large numbers of foreclosures. This dissertation is addressed to the question of what, if any differences are observed between the post-foreclosure trajectory of REOs coming out of federal and private inventories and what the implications of those trajectories are for middle- and working-class neighborhoods in cities like Detroit. In this chapter, I summarize the central findings of this dissertation and disuss their implications.

10.1 Central Findings

I evaluated outcomes for properties passing through federal and private inventories using a number of criteria derived from past research. First, I evaluated the degree to which federal entities were more or less likely to sell a property to an investor, all else being equal. While investor activity is not inherently harmful, prior research identifies a number of problems with investor activity in neighborhoods with high foreclosure rates. These problems include vacancy and blight stemming from property deterioration and tax delinquency (Ford et al., 2013; Hwang, 2015). Examining descriptive statistics, I found federal entities sold smaller shares of properties to investors, both across the Detroit tri-county area and in the city's strong neighborhoods alone, with HUD selling by far the least amount. Applying regression to control for property characteristics and neighborhood conditions, I found similar patterns. While the likelihood of private entities selling Detroit REOs remained nearly flat across the study period, hovering around a 70% probability of

selling an average home in Detroit's strong neighborhoods to an investor, the likelihood of federal entities selling to an investor dropped over time, particularly during and after 2009. This finding provides some evidence of the effectiveness of federal programs, particularly the First Look program, in increasing homeownership opportunities in Detroit relative to private entities. Differences between the GSEs and private entities, however, were quite small, particularly compared to the trends exhibited by HUD. Some of this is explained by the GSEs use of bulk sales to dispose of inventory, which, in turn, is linked to these entities' pressures to focus on financial safety and soundness (Dixon, 2011).

Both federal and private entities were far more likely to sell REOs located in inner- and outer-ring suburbs to owner-occupants. This is certainly due, in part, to greater demand from homebuyers in those areas and less competition from investors, but it is also likely a function of the expectations federal and private entities have of these markets and their willingness to hold properties to maximize returns in markets where home values are viewed as likely to appreciate. This view was clearly not held for Detroit's strong neighborhoods, where lack of local knowledge may have led to greater investor involvement than necessary.

A second criterion I used to examine the likelihood of REO outcomes in helping or harming neighborhood conditions is the duration of properties in REO inventory. Prior research has been concerned with rapid sales in lower-income and high-foreclosure neighborhoods, impeding the ability of local entities to use NSP for acquiring foreclosed properties (Immergluck, 2012). My findings are consistent with this research; they show a rapid reduction in the duration of properties in inventory around 2008. Further, I found that durations for the GSEs rapidly declined slightly later than durations for private entities, which provides evidence the GSEs accelerated sales as their inventories swelled after 2010. HUD, on the other hand, had far longer durations than the GSEs or private entities, consistent with my expectation that HUD would take far longer to sell properties due to the time required for servicers to convey foreclosed FHA-insured properties to

HUD. Rather than increasing the likelihood of sale to owner-occupants, these prolonged durations likely led to greater rates of property deterioration.

The third criterion I used to examine the likelihood of REO outcomes in helping or harming neighborhood conditions is the impact of nearby REO properties on home prices. My findings suggest that HUD's older inventory is closely linked to discounted home prices. While these discounts appear in Detroit's strong neighborhoods, they were much worse in outer-ring suburbs. This is consistent with research by Kobie and Lee (2011), who found that nearby foreclosures imposed less of an impact on non-distressed sales in the city of Cleveland than in the city's suburbs. Given the predominance of FHA-insured properties and HUD-owned homes in Detroit, however, the marginal effect of these properties adds up to a massive depreciation of home values.

In addition, I compared the impacts of investor and owner-occupant acquisitions of REOs. I found that REOs acquired by investors were more likely to be subject to tax foreclosure than those purchased by owner-occupants, all things being equal. Further, former REOS acquired by investors were more likely than those acquired by owner-occupants to impose a discount on the sale price of nearby properties. These findings offer at least provisional validation for claims made in previous studies about the impact of investor buyers.

10.2 Policy Implications

10.2.1 Improved Efforts to Prevent Foreclosures

While there are limits to what can be concluded from this study due to the limitations of the data, my dissertation provides strong evidence that REOs, both while in inventory and after sale to investors, are harmful to nearby home values. Completed foreclosures are likely to remain vacant for extended periods of time, particularly for HUD due to the lengthy period between REO acquisition and disposition for this agency. These vacant

REOs are susceptible to deterioration and invite crime, which in turn erodes the confidence of nearby homeowners, encouraging them to disinvest and potentially move, contributing to long-term negative neighborhood change. REOs purchased by some types of investors may also remain vacant for extended periods of time, leading to the same negative neighborhood outcomes. One way to curtail blight stemming from vacant REOs is to prevent avoidable foreclosures in the first instance. While foreclosure prevention is a high priority for the GSEs and HUD, principally as a means of reducing carrying costs and losses suffered on REO sales, efforts at foreclosure prevention may need to be evaluated and amended to improve performance and ensure the largest number of avoidable foreclosures are prevented, particularly in cities and communities where foreclosures are concentrated and home values have not recovered, as is the case with Detroit.

This is not to say federal agencies have not taken important steps to improve foreclosure prevention efforts since the onset of the mortgage foreclosure crisis. The GSEs have undertaken a large number of foreclosure prevention actions, including those that have allowed borrowers to retain their homes. Between September 2008 and April 2016, the GSEs completed more than three million home retention actions, more than 60% of which were permanent mortgage modifications under the federal HAMP and Home Affordable Refinance Program (HARP) programs (Federal Housing Finance Agency, 2016b). Although the number of home retention actions taken by the GSEs have decreased since the early 2010s, so too have the overall number of foreclosure starts and seriously delinquent loans. Much of this improvement is due to the recovery of home prices in many housing markets.

Despite the declining number of foreclosure starts nationally, numerous cities have not experienced the same improvements in home prices and continue to possess neighborhoods with large numbers of underwater borrowers, seriously delinquent mortgages, and REO properties. In recognition of this fact, the FHFA and the GSEs, in partnership with the NCST, a national nonprofit experienced in neighborhood stabilization efforts,

launched the Neighborhood Stabilization Initiative (NSI), which expands on the GSEs' existing mechanisms for preventing foreclosures and disposing of REOs in the nation's hardest hit neighborhoods. The City of Detroit and Cook County, IL (which contains Chicago), were selected as sites to pilot the NSI in 2014. As part of the NSI, the GSEs offer borrowers greater reductions in monthly mortgage payments than previously available (MyCity Modification), potentially reducing monthly payments by as much as 60%. These modifications operate by reducing interest rates, adding past due balances to the mortgage principal balance, and extending loan terms up to 40 years (Fannie Mae, n.d.; Federal Housing Finance Agency, 2015). At the time FHFA announced the NSI, critics charged that modifications, even such enhanced modifications, were inadequate for preventing additional foreclosures in cities like Detroit, where many borrowers were and remain underwater, with some sources reporting as many as 40% of Detroit homeowners being underwater (Benson, 2014). According to one Detroit-based activist,

> The program's "enhanced" MyCity Modifications will only reduce interest rates and lengthen the loan term up to 40 years for those who qualify. A lower interest rate is always welcome, but if it's still applied to a grossly inflated loan balance over 40 years, many struggling homeowners will give up on such a "take-it-to-the-grave" mortgage and walk away (Babson, 2014).

In response to such criticisms and public protests of FHFA policy, the FHFA ultimately reversed its position on principal reduction in April 2016 (Federal Housing Finance Agency, 2016a). These reductions are available to seriously delinquent underwater borrowers whose loans are owned by the GSEs. Given the recency of this principal reduction program, it remains to be seen how many borrowers are able to participate. One area of concern is the incentive structure for servicers, who are ultimately responsible for enrolling underwater homeowners in these plans. In the past, critics have charged servicers with foreclosing in instances where borrowers were eligible for modifications. Reasons for this include the additional time and effort required by servicers for modifications (Thompson,

2009). Principal reduction programs should be thoroughly evaluated in Detroit and other areas with concentrations of underwater borrowers to assess whether such program are maximizing the enrollment of eligible borrowers.

In order to reduce their credit risks and, secondarily, further reduce the number of avoidable foreclosures, the GSEs and HUD in recent years have engaged in the bulk sale of seriously delinquent loans to investors prior to foreclosure. In addition to clearing liabilities from the portfolios of federal agencies, these sales are ostensibly designed to help borrowers avoid foreclosure by placing these loans in the hands of private investors, who have greater flexibility in helping borrowers to remain in their homes or work out alternatives to foreclosure (Goldstein, 2014; Perlberg et al., 2015). The seriously delinquent loans included in these pools are located throughout the country, covering a wide swath of housing markets, but many are concentrated in distressed housing markets where home values have not recovered (Edelman, Zonta, & Rawal, 2016). In 2010, HUD first introduced the Distressed Asset Sale Program (DASP) to auction pools of seriously delinquent home loans in danger of foreclosure (Edelman et al., 2016; Goldstein, 2016). Freddie Mac created a similar auction program in 2014, followed by Freddie Mac in 2015. Through early 2015, HUD alone had sold roughly 100,000 loans through the DASP program (Perlberg et al., 2015). The GSEs have sold far fewer to date, but the size of their pools have grown with each offering. Fannie Mae's fifth and most recent sale included 7,900 loans, while its previous pool included approximately 6,500 loans (Fannie Mae, 2013b).

In the first years of DASP, HUD allowed only private investors, such as private equity firms and hedge funds to bid on pools of seriously delinquent loans. Large corporate investors like the Blackstone Group dominated these auctions. Housing activists and investigative reporters found that some of the buyers of the first pools of distressed loans were accelerating the pace of foreclosure, rather than increasing the number of home retention actions (Goldstein, 2015; Perlberg et al., 2015; Sen, 2015). Mounting pressure from activists and their allies led HUD in April 2015 to change its policies and allow nonprofits to also

bid on these pools of loans, among other changes, including the requirement that buyers evaluate whether delinquent borrowers were eligible for government mortgage modification programs. HUD has also set a target of selling 10% of delinquent loans to nonprofits and government entities. While these provisions to increase the number of sales to nonprofits and government entities and requirements for buyers to work harder to modify delinquent loans are sound improvements over past policy, these distressed loan sales require continued examination to ensure they do not harm neighborhoods the way REO bulk sales have in cities like Detroit. Although HUD's requirements for investor buyers are detailed and incorporate critical lessons learned from the foreclosure crisis, HUD has few enforcement mechanisms. Prohibiting investors who fail to meet the requirements of DASP from participating in future sales is certainly important, but likely not incentive enough to insure buyers make good-faith efforts to do their best to help borrowers avoid foreclosure and, when that is not possible, sell properties to owner-occupants. HUD, at least, is amending its policies in response to community and political pressures. The GSEs have yet to take these criticisms into account in their loan sale programs. These agencies, however, cannot rely on economic incentives alone to ensure that investors are working with borrowers on home retention actions (Edelman et al., 2016).

The results of this study support a number of recommendations made in recent works examining the implications of distressed note sales (Edelman et al., 2016; Goodman & Magder, 2016), including:

- Ensure investors do not walk away from properties they move through foreclosure. Walkaways add to abandonment and vacancy, erode neighborhood conditions, and impose additional costs on municipalities. This study links large investors to alarmingly high rates of tax foreclosure and blight, so enforcement is required to prevent buyers of pooled loans from reproducing these negative neighborhood outcomes.

- Ensure investors exhaust all possible foreclosure prevention options, including principal reduction, before foreclosure. These pools of distressed loans are sold to in-

vestors at a substantial discount, which provides them with greater flexibility in allowing for modifications including principal reduction.

- Prohibit investors from offering unsustainable modifications, which may be designed to fail to provide investors the appearance of propriety while allowing them to recover properties for profit-maximizing purposes.

- Ensure that foreclosures are adequately marketed to prospective homebuyers to sustain neighborhood owner-occupancy rates. HUD requirements already require foreclosures to be sold via a "First Look" program like that offered for REOs, increasing the opportunities for homebuyers and nonprofits to purchase homes. Buyers' adherence to those requirements should be strictly monitored. Prior audits of "First Look" have found the possibility of REO fraud, wherein brokers and listing agents throw barriers in the way of homebuyer participation, favoring investor buyers. Such fraud should be guarded against in note sale programs.

- Create strong neighborhood stabilization standards. For example, require that investors, after foreclosure, comply with vacant property registration ordinances and property codes, adequately maintain their properties, and stay current with local property taxes. HUD has already taken positive steps in this direction with the creation of Neighborhood Stabilization Outcome (NSO) loan sales, which contain loans concentrated in distressed housing markets. Investors in these pools are required to keep 50% of borrowers in their homes or satisfy an equal number of actions intended to help stabilize neighborhoods, including sales to owner-occupants, holding properties for rental, and donating properties to land banks (U.S. Department of Housing and Urban Development, 2015a). These actions support several of the recommendations itemized above.

10.2.2 Improved Efforts to Retain Occupants of Foreclosed Homes

In those instances where foreclosure is unavoidable, there are a number of actions that could be taken by federal and private entities to improve neighborhood outcomes. In the case of foreclosed homes with occupants, it may be preferable to retain those occupants and sell the properties to buyers willing and able to retain them as renters or buyers on a lease-to-own plan. In markets like Detroit, where investor activity in the market for foreclosures outweighs homebuyer activity, selling occupied properties can be beneficial not only for the occupants, but also for neighborhoods by reducing the number of vacant properties. Investors can also benefit from the sale of occupied properties because their rental revenue would already be secured (Been & Glashausser, 2009). The practices of federal and private entities, however, encourage the eviction of occupants as part of the process of preparing REOs for retail sales. The rules governing how federal agencies treat occupancy of foreclosed homes, however, allow leeway for keeping occupants in place. While it is standard practice for lenders to convey foreclosed FHA-insured properties to HUD vacant, federal regulations allow HUD to have properties conveyed with occupants when certain conditions are met (Bratt, 2016). Specifically, HUD allows lenders to convey occupied properties in those instances where it is "in the Secretary's interest," which are when:

- Occupancy of the property is essential to protect it from vandalism from time of acquisition to the time of preparation for sale
- The average time in inventory for HUD's unsold inventory in the residential area in which the property is located exceeds six months
- With respect to multi-unit properties, the marketability of the property would be improved by retaining occupancy of one or more units
- The high cost of eviction or relocation expenses makes eviction impractical ("Conveyance of Occupied Property, 24 CFR 203.670," 1996; "Criteria for Determining the

Secretary's Interest, 24 CFR 203.671," 1996).

Findings from this study suggest that the first two criteria may be met, particularly the second criteria. HUD, therefore, should direct servicers of soon-to-be-foreclosed FHA-insured properties in distressed housing markets to take steps to retain occupants, where possible. After conveyance, HUD might prioritize sale of these occupied properties to investors or nonprofits willing to retain these occupants as renters or lease-to-own buyers.

The GSEs' policies regarding conveyance of foreclosed properties had, until December of 2014, allowed tenants of foreclosed properties to remain as renters during and after the foreclosure period. Enacted in 2009, Protecting Tenants at Foreclosure Act (PTFA), until its expiration, was the only source of federal protection for tenants of foreclosed properties. The PTFA had provided most renters with the right of at least 90 days' notice before being required to vacate ("Protecting Tenants at Foreclosure Act, Pub. L. No. 111–22 §701," 2008). The law also stipulated that tenants must be allowed to stay through the length of their leases, except in cases where homes were sold to owner-occupants or leases were immediately terminable by the state. Although this law has expired, in 2014, the FHFA decided to change its policies to allow foreclosed borrowers, or a third-party acting on their behalf, to purchase their homes at fair-market value (Federal Housing Finance Agency, 2014a). Prior to this policy change, foreclosed borrowers were required to pay the full balance of their mortgages to repurchase their homes. This policy change has the potential to prevent further properties from becoming vacant and should be supported by efforts to connect homebuyers with nonprofits working to retain occupants of foreclosed properties. Barriers to the cooperation of the GSEs' with nonprofits acquiring properties for neighborhood stabilization efforts should be identified and addressed. Congress should also revisit the possibility of extending the PTFA to increase opportunities for tenants of foreclosed homes to remain in place as long as possible.

10.2.3 Improved Efforts to Maintain Properties to Neighborhood Standards

The findings of this dissertation support calls made elsewhere for federal and private REO owners to improve their oversight of contractors responsible for maintaining properties to neighborhood standards (National Fair Housing Alliance, 2014a, 2014b). Although this study does not directly show that REO owners failed to maintain their properties to such standards, it does show that REO properties were closely linked to blight violations and nearby home price discounts. Both vacancy and under-maintenance are likely responsible for these linkages. Possible steps that could be taken by federal agencies to improve maintenance include the prohibition of contractors who fail to demonstrate adequate maintenance from being awarded future federal contracts.

10.2.4 Improved REO Sales Practices

When foreclosure is unavoidable and there are no current occupants, or where current occupants are unable or unwilling to remain or find assistance to remain in their homes, foreclosures must then be sold unoccupied. As shown in this dissertation, federal and private entities alike sold large shares of REOs to investors, often with negative consequences for neighborhoods. Some investors, particularly large national investors, acquired substantial numbers of REOs with what seems to have been the intention of profiting off properties they could quickly rent or sell and allowing others to lapse into tax foreclosure. Properties abandoned by investors remain vacant for extended periods, harming homeowner confidence and incurring additional costs for cities. Investors linked to these negative outcomes should be prohibited from purchasing REOs, particularly REOs owned by federal entities. The GSEs and HUD should work with local governments nationwide to collect information on code violations and tax delinquency for investor buyers, regardless of whether they have previously purchased REOs. The usefulness of this information, however, may be limited by investors' practice of hiding behind multiple Limited Liability Corporations (LLCs). An investor may sidestep rules prohibiting them

from bidding while possessing outstanding tax liens, for instance, simply by bidding using a new LLC. To anticipate these maneuvers, federal agencies might require bulk and cash buyers not purchasing homes for primary residence to fully disclose their identity. The U.S. Department of the Treasury recently established such a rule for investors in high-end real estate in Manhattan and Miami (Story, 2016). Such rules might fruitfully be extended to the low-end of the housing market to prevent further acquisitions by harmful investors (Capps, 2016).

A second recommendation for improving outcomes related to REO sales is to prohibit federal and private entities from selling highly deteriorated low-value properties. Federal and private alike have demonstrated a willingness to sell highly distressed properties to speculators and other bad buyers in Detroit. Institutional ownership of such properties, particularly when ownership is by a federal agency, presents an opportunity to address neighborhood blight, perhaps through demolition or donation to a land bank. By selling these properties to private investors, REO owners exacerbate blighted conditions by allowing these distressed properties to sit in disrepair for extended durations. Federal agencies have taken some positive steps in this direction, both in Detroit and other cities with high foreclosure rates. A notable achievement in this regard is the agreement Fannie Mae and HUD, along with a number of national servicers, reached with the CCLRC in 2009 to periodically offer pools of low-value properties for $1 along with a small contribution toward demolition costs (Fujii, 2015). This achievement likely benefited from the existence of an established infrastructure for land banking in Cleveland (Dewar, 2006). Fannie Mae reached a similar agreement with the DLBA, but it was much later and for far fewer properties (Gallagher, 2014). To build on these positive steps, federal agencies should make such procedures for handling low-value properties the norm, not the exception to ordinary REO disposition. Donations or alternative disposition approaches for low-value properties should occur *before* they are placed on the market, where investors can acquire them. For such a system to work best, federal agencies should communicate

early and often with local entities capable of responsibly handling low-value properties, e.g., land banks.

A third recommendation for federal entities is to evaluate the impacts of "as-is" sales on the share of REOs purchased by homeowners. Although this dissertation does not provide direct evidence of this practice dampening demand among prospective owner-occupants, past studies have pointed out the risks associated with these sales and suggested they might make such sales more attractive to investors than homebuyers (H. Thomas, 2015). Prospective homebuyers might be more interested in purchasing REOs if these sales had more of the guarantees typical of conventional real estate transactions. Related to this point, federal agencies might better familiarize themselves with the strong neighborhoods located within cities with overall distressed housing markets to make more informed decisions about where to repair properties to increase the likelihood of sale to a homebuyer. By undertaking these repairs, REO sellers should be able to adequately represent property conditions at sale.

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