Geographies of Mortgage Market Segmentation: The Case of Essex County, New Jersey[*]

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Abstract: Since the late 1980s, mutually reinforcing trends in economic growth, public policy, and community activism have fostered a wave of residential mortgage lending to "underserved markets" in U.S. cities. Yet many of the changes in housing finance that supported sustainable homeownership also lured a new generation of subprime and predatory credit institutions specializing in high-cost, high-risk lending. For many urban and minority neighborhoods, the old problems of exclusionary redlining are now accompanied by new dilemmas of exploitive greenlining. In this paper, we analyze the market penetration of subprime lending institutions and the subsequent concentration of mortgage "pre-foreclosures" in low- and moderate-income, African American neighborhoods. Focusing on Newark, NJ, and its surrounding suburbs, we use Gary King's (1997) ecological inference technique and a series of logistic regression models to assess the role of borrower characteristics, institutional divisions, and neighborhood context in the process of mortgage market segmentation. The evidence corroborates theories emphasizing the dynamics of capital investment, financial services restructuring, and the economic incentives for racial-geographic targeting -- and not the presumed credit deficiencies of urban and minority homeowners. Unfortunately, the tidy empirical analysis offered here is overshadowed by the enormous societal experiment now underway across the U.S., as a wave of delinquencies, defaults, and foreclosures undermines the belated minority homeownership gains achieved during the unprecedented boom of the 1990s.

Keywords: capital investment, discrimination, redlining, subprime lending.

Introduction

Since the early 1990s, homeownership has become a central plank in efforts to expand

opportunity for racial and ethnic minorities and low- and moderate-income *people* and *places*.

This trend emerged from several intersecting developments -- the reinvention of assisted

housing, the growth of a sophisticated secondary market in mortgage-backed securities, the

militant activism of community reinvestment advocates, and enhanced Federal enforcement of

fair housing and fair lending statutes (Listokin and Wyly, 2000; Squires, 1992). Federal and

state policies began to promote homeownership as a neighborhood revitalization strategy, and

community development actors supported ownership as a means of deconcentrating poverty in

distressed urban neighborhoods (Schwartz and Tajbakhsh, 1997). In the unusually favorable

macroeconomic climate of the 1990s, these trends coalesced and funneled a wave of lending to

low- and moderate-income households and racial and ethnic minorities, boosting homeownership

in communities that were long excluded from mainstream private capital markets.

Unfortunately, the reinvestment wave of the 1990s also created incentives and

opportunities for unsustainable and deceptive credit practices. Researchers, banking regulators,

community activists, and mainstream bankers began to confront a new generation of high-risk

lenders specializing in borrowers with "subprime" credit histories (HUD-Treasury Joint Task

Force, 2000; Scheessele, 1999). The subprime sector was certainly no creation of the 1990s, and

there is a general consensus that most subprime lenders are reputable firms serving those unable

to obtain credit on more favorable, prime terms. But the subprime boom also provided

incentives for new types of deceptive and abusive business practices that came to be known as

"predatory" lending. Predatory lenders, often working with loan brokers, home improvement

contractors, and real estate attorneys, devised new and often quite sophisticated schemes to

extract profits from urban communities: the most common strategies include aggressively marketing high-cost home improvement or home equity loans to existing owners without regard to repayment ability (to obtain properties through foreclosure, or to create opportunities for "flipping" and refinancing, with additional rounds of excessive or hidden fees), and pressuring owners to purchase unnecessary, high-cost credit products (such as single-premium credit life insurance policies financed into a mortgage) (see HUD-Treasury Joint Task Force, 2000, pp. 25-49). The expansion of predatory practices threatens the long-overdue gains in homeownership in urban and minority communities, as mounting foreclosures sap individual equity and neighborhood vitality. As a result, the subprime industry has attracted intense scrutiny by researchers, regulators, and activists (Coalition for Responsible Lending, 2000; Drysdale and Keest, 2000; General Assembly of North Carolina, 1999; HUD-Treasury Joint Task Force, 2000; OCC, 2002; White and Mansfield, 2002; Zimmerman et al., 2002).

As debate has intensified over the costs of the subprime lending boom, however, several critical questions have eluded consensus. In addition to predictable disputes over the meaning of "subprime" and "predatory," two specific questions have emerged. Does the subprime industry, in whole or in part, actively target urban and minority communities -- or can its market penetration be justified on the basis of income or legitimate risk characteristics of borrowers in different neighborhoods? Is there a direct connection between the expansion of the subprime industry and the incidence of neighborhood distress, as measured by such benchmarks as loan foreclosures?

In this paper, we present an empirical analysis to evaluate both of these questions. Our approach is premised on the theoretical insights of the political-economy literatures on the circulation of capital in the urban built environment (Bradford and Rubinowitz, 1975; Dymski,

1999; Harvey, 1985; Merrifield and Swyngedouw, 1997; Smith, 1979, 1996; Smith et al., 2001), but seeks also to exploit the econometric techniques commonly used in neoclassical housing market analysis (Browne and Tootell, 1995; Duca and Rosenthal, 1994; Gyourko and Linneman, 1993; Rothenberg et al., 1991). The remainder of the paper is organized as follows. First, we outline the fundamental theoretical impasse between neoclassical and political economy literatures, and its relevance to the debate over predatory lending. We then examine the distribution of mortgage "pre-foreclosures" in Essex County. Next, we use a multivariate loan selection model to examine how this distribution results not only from borrower choices and characteristics, but also from institutional divisions. We then use Gary King's (1997) ecological inference techniques to examine the direct connection between subprime lending and pre-foreclosures. Finally, we discusss the implications of the analysis for housing research, public policy, and community activism.

Mortgage Market Dynamics and Racial Inequality

The dynamics of housing production and consumption constitute a central line of inquiry at the urban studies interface of economics, sociology, political science, geography, and planning. In turn, a rich vein of research and debate in housing studies has focused on issues of race and class inequalities in access to housing consumption, public services or amenities, and opportunities for wealth accumulation or intergenerational upward mobility (Duca and Rosenthal, 1994; Galster et al., 1999; Gyourko and Linneman, 1993). Among the most hotly-debated issues in this literature concerns the extent, nature, and severity of racial and ethnic discrimination in access to mortgage credit (for a recent review, see Turner and Skidmore, 1999). The debate over lending discrimination has generated thousands of pages -- in scholarly articles

by academic researchers, working papers and reports by industry researchers and federal regulators, and documents by community activists and advocacy organizations. The accumulated evidence of the debate is well summarized by Turner and Skidmore (1999, p. 2), who conclude that "a substantial body of objective and credible statistical evidence strongly indicates that discrimination persists." Nevertheless, this judgement is not accepted by analysts committed to orthodox economic theory, who maintain that discrimination (as an economically irrational forfeiture of profit opportunities) cannot survive in competitive markets; accordingly, these observers dispute the claim that bank discrimination is responsible for observed racial disparities in mortgage lending. These analysts emphasize a variety of alternative explanations for the disparities found in most discrimination studies: reduced demand among minority borrowers or neighborhoods (e.g., Avery et al., 1999; Ling and Wachter, 1998); endogeneity bias and related problems with econometric specifications (cf. Browne and Tootell, 1995); unobserved racial differences in liquid assets or credit history and other cases of omitted-variable bias (Pennington-Cross et al., 2000); variations in lender outreach, marketing, and pre-selection mechanisms (e.g., Buist et al., 1994); and deeply-entrenched racial differences in education, employment, and other "pre-market" factors that cannot be blamed on the mortgage lending industry (for synthetic reviews, see LaCour-Little, 1999; Turner and Skidmore, 1999).

The last explanation is the most fundamental, since it makes the assumption that lending discrimination can be understood in isolation from broader inequalities rooted in the political economy of race and class. The clearest instance of this assumption appeared in the widely-cited Boston Fed study of lending discrimination, which exerted an enormous influence on scholarly and policy debates in the 1990s (Browne and Tootell, 1995; Munnell et al., 1992, 1996). The Boston Fed researchers used loan records newly available in the first year after the 1989

amendments to the Home Mortgage Disclosure Act (HMDA), augmented with proprietary data from cooperating Boston lenders -- a total of "38 additional variables located in the standard loan application form, the credit report, and the lender's worksheet, which constitute practically the entire information set of the lender" (Munnell et al., 1996, p. 28). The researchers calibrated a logit model of loan rejection as a function of four sets of predictor variables, measuring a) probability of default, b) costs of default, c) loan characteristics, and d) personal characteristics, such as gender, race, and age. As one of the measures of the probability of default, the researchers extracted longitudinal data from the Panel Survey of Income Dynamics, and estimated a set of equations modeling the probability that an individual will become unemployed in the next five years as a function of those variables that would be available to a lender -- age, gender, race, education, years on the job, and marital status. "If minorities are, in fact, the last hired and the first fired in a given industry, or if they are concentrated in more cyclical industries, then these equations would assign them a higher probability of unemployment, all else constant, and they would be less likely to get a loan" (Munnell et al., 1996, p. 29). By inserting these reduced-form prediction equations into the loan model, the Boston Fed researchers incorporated a fundamental theoretical assumption -- that it is necessary and possible to distinguish "discrimination in the mortgage market from effects related to race in the rest of the economy" (Munnell et al., 1996, p. 29). Even after accounting for all possible explanations, the researchers found a relative rejection ratio of 1.8 to 1 between minorities (blacks and Hispanics) and whites.

This line of reasoning is one of the critical points of departure for institutional and political economy accounts of urban investment processes (Bradford and Rubinowitz, 1975; Harvey, 1982, 1985; Smith, 1979, 1996; Smith et al., 2001; Squires, 1992). Analysts working in

this tradition reject the exogenous treatment of credit market practices, and argue instead that inequalities in housing finance are cause as much as effect -- a segmented credit market maintains and reproduces uneven neighborhood development, and structures long-term class and race inequality in wealth accumulation, educational opportunity, and labor market prospects. All of these inequalities, it is argued, are essential for continued accumulation in the context of capitalist urbanization (see Harvey, 1982, Chapter 11; Harvey, 1985). Harvey's work on the Baltimore housing market is the most forceful and explicit elaboration of this perspective (see Harvey, 1982, and 1985, Chapter 3). Harvey develops a comprehensive Marxist framework for the analysis of capitalist urbanization, forging a synthesis of classical theories of absolute and differential land rent, and offering theories of class conflicts between landlords and tenants as well as among different factions of capital (landowners vs. developers, homeowners vs. investors). In practice, these class tensions are worked out in the context of national regulations "designed to maintain the existing structure of society intact in its basic configuration while facilitating economic growth and capitalist accumulation, eliminating cyclical influences, and controlling social discontent" (Harvey, 1985, pp. 70-71). Broad national policies are not transmitted directly to the neighborhood level, however, but instead are mediated by partially autonomous state institutions operating at different scales. "[I]n the United States the main mechanism for coordinating national and local, individual and societal activities lies in the hierarchical structure of financial institutions operating under governmental regulation" (Harvey, 1985, p. 71). Savings and loans, banks, and independent mortgage companies "operate together to relate national policies to local and individual decisions and, in the process, create localized structures within which class-monopoly rents can be realized" (Harvey, 1985, p. 71). Harvey then marshals a careful empirical analysis of data on lending, housing, and population

characteristics to identify eight spatial housing submarkets in Baltimore in 1970, each with a

distinct regime of mortgage finance relations. Of central concern to us here is that Harvey does

not see these submarkets as descriptive or natural categories, or as the unproblematic outcome of

a benign equilibrium between supply and demand. A segmented credit market performs the

essential functions of producing scarcity, maintaining class inequality, and enhancing

opportunities for capital accumulation.[1]

Why target minority neighborhoods?

These opposing interpretations are at the heart of contemporary debate over predatory

lending, and the charged question of whether lenders target minority neighborhoods. Most

analysts see the market for high-risk, high-cost lending as an efficient (if unfortunate) economic

response to demand-side forces: the spatial concentration of subprime lending, according to this

view, is nothing more than a response tailored to the places where there are large numbers of

borrowers with credit deficiencies that disqualify them from mainstream, prime markets. But

there are also powerful incentives for predatory agents -- a small subset of the subprime industry

-- to actively target urban minority communities as a routine way of doing business; these

incentives are distinct from those prevailing among prime lenders and in markets with healthy

prime competition. First, *exploitation* (deceptive marketing, hidden loan terms, exhorbitant fees,

etc.) is easiest in areas with concentrations of borrowers who have experienced (or fear)

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[1] As one illustration of the argument: "The class-monopoly rent gained in one submarket is not independent of its
realization elsewhere, and certain strong multiplier effects can be detected. Suppose, for example, that there is a
speculative boom in the inner city through which new submarkets are formed out of existing neighborhoods and that
the old residents of these neighborhoods are forced to seek housing opportunities in suburbia. Then, the greater
class-monopoly rent earned by the inner-city speculator, the greater the opportunity to realize rent on the suburban
fringe. Multiplier effects of this sort may be captured by the same financial institutions or, in some cases, by the
same entrepreneur. If there is no conscious collusion to generate the multiplier effect, the calculus of profits and
losses, of expectations and perceived risks, will function as a hidden-hand regulator to achieve the same results"
(Harvey, 1985, p. 81).

exclusion (e.g., denial by name-brand prime banks). Locating these concentrations has become a growth industry with the proliferation of specialized databases and geographic information systems, and deception is facilitated by the impossibility of genuine comprehension of all of the legal documents involved in typical mortgage transactions (White and Mansfield, 2002). Second, the historical geography of metropolitan development and racial segregation means that certain predatory practices -- such as fraudulent home-repair schemes -- can only be made profitable by exploiting minority neighborhoods with aging homes and years of deferred maintenance (often exacerbated by a history of redlining by prime banks). Third, the limited yet significant gains in minority homeownership after the fair housing legislation of the 1960s created a cohort of minority owners, most of them living in segregated moderate-income areas of cities and inner-ring suburbs, who had by the 1990s built substantial equity in older homes needing repair.

Fifth, new economics of default and foreclosure appear to induce risky lending in minority neighborhoods with little prime competition. Virtually all research on residential loan default portrays it as an options pricing problem, where it is economically rational for an owner to exercise the put option (to "sell" the mortgage contract by shirking payments) when the house value falls below the outstanding loan balance (Capozza et al., 1997; Kau et al., 1994; Quercia and Stegman, 1992; Quigley et al., 1993; Vandell, 1993). Although this literature has seen considerable methodological innovation in recent years (measurement of default costs, discount rates, trigger events, etc.), the fundamental behavioral assumptions involve homeowners' economic rationality; Foster and Van Order (1984, 1985) go so far as to use the term "ruthless" to describe the behavior of owners who default immediately after the house value dips below the mortgage value. Unfortunately, there has been little scrutiny of the ruthlessness of lenders since

Wachter's (1980) pioneering analysis of the 1968 FHA amendments. Wachter (1980)

demonstrated how interest rate ceilings and FHA's loss insurance practices encouraged lenders to

rely on ever-higher up-front origination fees (discount points), making the contract interest rate

irrelevant as a measure of the effective yield: "The effective yield depends on when the principal

is repaid. The sooner the loan is repaid, the greater is the return" (p. 432).[2] Either rapid

foreclosure or deliberate selection of risky loans could be used to maximize returns, and in the

1970s and 1980s FHA was rocked by scandals over these abuses; subsequent reforms have

reduced, but not completely eliminated, these problems (Bradford, 1998; Capone, 1996). Today

there are compelling reasons to view the subprime industry as a privatization and modification of

the FHA abuses, as HUD's reforms coincided with expanded mortgage capital and secondary

market investment in the 1990s. The potential for high "transactional profits" (e.g., up-front

fees, prepayment penalties, yield-spread premiums to brokers, single-premium credit life

insurance, etc.) encourage lenders, brokers, and contractors to find homeowners who a) have

accumulated equity, b) are in financial distress due to consumer debt, medical bills, or large

home repair expenses, and c) have (or believe they have) few options for prime credit from

mainstream banks (Engel and McCoy, 2002). Especially in the home equity, home repair, and

refinance markets (where even low-income owners have equity if they have been in their homes

for many years), an unscrupulous but economically rational lender has a strong interest in rapid

delinquency. So long as there is remaining equity, another loan can be made with another round

of fees; and eventually, when equity is exhausted, the lender can count on a growing industry

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[2] Put another way, "If the loan was paid off early, these up-front charges became extra profits for the lenders. One
way to force early payoff was to make loans to individuals who could not afford them. HUD would pay for all
subsequent foreclosure expenses, including interest payments during the time of delinquency, allowing unscrupulous
lenders to earn easy profits." (Capone, 1996, p. 5-77).

that markets defaulted loans and foreclosed properties to "vulture investors."[3] The boom of the

1990s kept foreclosure loss rates low even as default rates increased in the subprime sector,

while the expansion of the secondary market funneled a wave of capital into residential

mortgages. And the secondary market provided suboptimal discipline of bad behavior, since

subprime loans, "especially those purchased from outside the institution's market area, are at

special risk for fraud and misrepresentation," (Board of Governors et al., 1999, p. 4), and "the

practice of providing support and subsituting performing loans for nonperforming loans to

maintain the desired level of performance on securitized pools has the effect of masking credit

quality problems." (p. 6). In sum, unscrupulous lenders have seen increased incentives to push

high-cost, high-risk credit in minority neighborhoods with an aging housing stock and with a

long history of redlining, discrimination, and justified distrust in mainstream banks; risks to

lenders are hedged at origination, and risks to brokers and contractors are minimal. Homeowners

face enormous risk.

The Case of Newark, New Jersey

To sketch an initial empirical portrait of these processes on the urban landscape, we turn

to Essex County, New Jersey, situated just west of New York City (Figure 1). Separated from

Manhattan by two rivers and a broad band of wetlands crisscrossed by a matrix of railroads,

highways, and deteriorating remnants of Megalopolis's industrial past, Essex County offers

textbook examples of several facets of urban distress. On the one hand, the commercial and

office functions of the county's major city (Newark) have been overshadowed by the behemoths

of Manhattan for at least half a century, relegating downtown Newark to down-market

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[3] We are grateful to one of the anonymous referees for suggesting this term, and for providing criticisms and valuable suggestions on how to conceptualize the "riskless arbitrage" of predatory racial targeting.

competitors or back-office support facilities for New York firms. On the other hand, the western suburbs of Essex County enjoy remarkable wealth created as neighborhoods were settled and developed to serve two functions: to accommodate decentralization and middle-class flight out of Newark and its surrounding web of densely-packed nineteenth-century cities, and to house the elite white-collar commuter classes venturing to jobs in Midtown and the financial district. The result is an especially polarized pattern of neighborhood wealth and poverty in a built environment with a high proportion of older homes requiring substantial reinvestment and rehabilitation.

'Pre-foreclosure' data

To understand the unanticipated neighborhood effects of credit segmentation and the mortgage lending boom of the 1990s, we can benefit from a monthly magazine and companion website produced by a company based in Oradell, New Jersey. *American Foreclosures and Auctions*, published by American Foreclosures, Inc., collects and publishes information gleaned from state court filings in New York, New Jersey, Connecticut, Florida, and Pennsylvania. The company also publishes New York and New Jersey court filings of *lis pendens*, a legal term that is translated literally as "pending suit." A *lis pendens* is a notice filed on public record to provide warning that the title to a particular property is in litigation. *Lis pendens* notices on mortgaged properties are filed by the lender holding the note *after* the borrower has defaulted, but *before* a court judgement of foreclosure has been rendered. These notices are commonly known as "preforeclosures," and they offer a lucrative time window in which realtors or other investors can step in to acquire a property for the cost of the unpaid principal mortgage balance

plus penalties and legal fees.[4] If a homeowner accumulated substantial equity before falling

behind on payments, and if the property is likely to sell readily on the open market, acquisition

can be extremely profitable. Many companies have emerged to provide information in this

niche, and their proliferation is a pathologically fascinating barometer of the borrowing binge of

the 1990s. American Foreclosures, Inc., proclaims that its goal is to "reduce the number of real

estate foreclosures in our area.... when a homeowner is unable to satisfy his mortgage

obligations, we may be able to provide him with a direct link to cash buyers, financial advisors,

and experts in the field of foreclosure who can assist him with a quick resolution." (American

Foreclosures, Inc., 1999, p. 6). The monthly magazine includes a rich stock of unvarnished

advertising by subprime lenders, brokers, realtors, attorneys, and home improvement contractors

-- as well as a boilerplate letter to contact homeowners listed in the preforeclosure pages.

Preforeclosures in Essex County

　　　Foreclosure trends provide clear indications of trouble in local housing markets, and on

this benchmark Essex County has not fared particularly well in recent years: foreclosure filings

jumped 48 percent between 1995 and 2000 (CFRI, 2001, p. 43). *Preforeclosures* offer a

complementary view of early warning signs, and suggest similarly troubling trends. We

obtained a list of all *lis pendens* notices filed for Essex County properties between August, 2000

and August, 2001, and geocoded these records in an effort to discern any coherent spatial

patterns.[5] The results inscribe a clear distribution rooted in the particularities of place and the

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[4] In some cases a lender only requires that the loan payments be brought current.
[5] These records were obtained from *NJ Lis Pendens Online*, a division of American Foreclosures, Inc., at
<http://www.njlispendens.com>. We accessed the data on August 7, 2001; unfortunately, the firm automatically
purges records more than one year old, and maintains archives only in the form of the print copies of the monthly
magazine. After the requisite pre-processing, we were able to geocode 90.0 percent of the 1,860 preforeclosure
records using 2000 TIGER street files. The vast majority of records that failed to match were the result of missing
or erroneous street names, and there is no reason to suspect any systematic spatial bias in these records.

idiographic regional geography of Northern New Jersey (Figure 2). Preforeclosures are heavily concentrated in Newark and its surrounding orbit of distressed, aging suburbs, with few notices filed in the wealthy enclaves of the western half of the county. But there are also telling signs in the patterns inside Newark itself. There are relatively few notices filed in the city's poorest neighborhoods, stretching southwest from the downtown core, primarily because of low homeownership rates. Similarly, there are few in the city's broad southeastern quarter, reflecting its nonresidential character (dominated by a patchwork of highways, rail corridors, an international airport, and storage facilities serving the nearby port of Elizabeth). Preforeclosures are also rare in the working-class district of the Ironbound, which has seen a vibrant surge in entrepreneurial activity and immigration from South America in the last fifteen years. It is possible that the absence of preforeclosures here reflects the difficulties predatory lenders face when they try to penetrate immigrant communities with clearly-bounded identities and social networks. The most severe problems in Newark appear in three distinct clusters: Forest Hills, an area north of downtown anchored by an historic district of various revival-style homes built in the late nineteenth and early twentieth centuries; Weequahic, on the city's southern edge; and the Vailsburg section, a finger of the city extending to the west between Irvington and East Orange. Severe concentrations of preforeclosures are also evident in the cities of Irvington and East Orange. Taken as a whole, the pattern of *lis pendens* filings is a close (but not perfect) fit with a map of the African American population (Figure 3). Preforeclosures appear most common in working-class Black neighborhoods with significant concentrations of homeowners, often older owners who have accumulated substantial home equity over the years. This neighborhood profile is precisely the type of community where incentives are strongest for predatory agents aggressively to market high-cost home equity loans and fraudulent home-repair financing

schemes, and who devise mechanisms for extracting fees through repeated refinancing (loan "flipping") and other "equity stripping" practices (Drysdale and Keest, 2000; Engel and McCoy, 2002; HUD-Treasury Joint Task Force, 2000, pp. 47-49).

This first glance confirms that mortgage preforeclosures exhibit a clear spatiality, and suggests that the homeownership boom of recent years has produced a geographically concentrated cohort of highly-leveraged, low-income owners who are vulnerable to unexpected home repair costs, medical bills, or layoffs in the climate of the present recession. We also know that the pattern shown in Figure 2 mirrors the market penetration of subprime lending institutions. Several considerations make it difficult, if not impossible, to draw a definitive causal link between the two.[6] We can, however, build a more rigorous case by addressing these considerations, and focusing on the "best-case" years of the 1990s. We constructed a second database of *lis pendens* filings for calendar year 1999, when the economic boom was approaching its peak. To the extent possible, the database was constructed to account for all relevant methodological limitations,[7] providing a rigorous and conservative assessment of

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[6] Two considerations are immediately apparent. First, several technical and methodological issues complicate any attempt to make a direct match of subprime loan to *lis pendens*. The pattern shown on the map is not standardized for variations in credit demand or the size of the housing stock. Many of the mortgages that went into default between August, 2000 and August, 2001 were originated in the 1980s or even earlier, while others were approved only a year or two before falling behind. Some of the loans were made on multi-family investment properties, in which the calculus of default is sharply different from that among owner-occupiers. And many of the foreclosure proceedings were initiated not by the original lenders, but by institutions that acquired loans through secondary market purchases -- making it impossible to use *the lis pendens* filings to identify specific lenders responsible for disproportionately high default rates. A second consideration is timing. The patterns traced out on Figure 2 present the most recent indicators of trouble in the local housing market, when economic uncertainty and mounting layoffs began to affect more and more households in late 2000 and through 2001. It could be argued, therefore, that the pattern is simply an unproblematic map of those hit first by the current recession. High-risk borrowers are concentrated in low- and moderate-income, African American neighborhoods, the reasoning goes; subprime institutions specialize in serving these clients, who are especially vulnerable to economic dislocation; and so any sudden trouble in the local economy will simply turn up a map of the 'frontier' of the underserved market -- the places where homeownership was most difficult to achieve and to sustain. This argument implies that we should have as much sympathy towards investors holding high-risk portfolios as we do for homeowners in default.
[7] Notices filed in 1999 were included only for those loans a) originated between 1993 and 1999, b) below the conforming loan limit for 1- to 4-family dwellings (a figure revised annually by the U.S. Department of Housing and Urban Development) and c) for which an address could be geocoded to the tract level. The final geocoding success rate was 87.0 percent. The result is a list of 883 loans made between 1993 and 1998 that lapsed into default and *lis*

mortgage troubles in the favorable economic conditions of the 1990s expansion. The resulting

pattern (Figure 4) supports an interpretation that is not appreciably different from the map in

Figure 2. But certain contrasts are apparent. It is clear that the clusters of preforeclosures in

Newark and its orbit of inner-ring suburbs are not simply artifacts of housing density: the

cohort-specific rate exceeds five percent in several parts of Newark, and in a swath of

communities from Irvington to East Orange. The standardized map accentuates fine-grained

patterns of neighborhood variation inside Newark, and it is certainly true that the highest

preforeclosure rates (those over ten percent) result from a handful of notices in areas of sparse

market activity. One tract in Lower Clinton Hill, part of Newark's South Ward, saw only 17

conforming single-family loans between 1993 and 1998, and 4 *lis pendens* notices in 1999 (23.5

percent). In a tract adjacent to Hank Aaron Field in the Springfield section, there were only 8

loans made, and 1 notice (12.5 percent). With these two exceptions, however, the pattern cannot

be dismissed as the product of small numbers. In the entire Vailsburg section of Newark, for

instance, lenders approved and granted a total of 2,319 single-family loans between 1993 and

1998. The area saw 76 *lis pendens* filings in 1999, yielding a rate that stands two and one-half

times above the countywide level for this period.

The pattern in Figure 4 brings us to the most serious interpretive challenge. When

confronted with this kind of pattern, mortgage industry advocates and anti-regulation legislators

invariably recite an orthodox economic explanation. Neighborhoods with high default rates are

those areas with concentrations of high-risk borrowers unable to qualify for prime credit from

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pendens proceedings sometime during 1999. The next step is to estimate a preforeclosure rate with an appropriate
denominator. For this purpose, we used loan records from the Home Mortgage Disclosure Act (HMDA) data
releases between 1993 and 1998 (Federal Financial Institutions Examination Council, 1994-1999). For each tract,
we tabulated the number of loans approved and originated for amounts below the conforming limit and backed by 1-
to 4-family dwellings; home purchase, home improvement, and refinance loans are all included in the total. For all
of Essex County, the denominator includes a total of 69,636 loans, yielding a cohort-specific preforeclosure rate of
1.27 percent for the year of 1999.

mainstream banks and thrifts -- and who therefore turn to those lenders willing to serve them (albeit at a justifiably higher cost of funds). The argument implies that the regrettable misfortunes of homeowners in default have nothing to do with improper behavior by anyone on the supply side. Borrowers simply failed to honor their mortgage obligations, either because of their own irresponsible decisions or due to layoffs or other unfortunate events. A rigorous evaluation of this argument requires that we test an explicitly geographical hypothesis -- that spatial variations in the market share of subprime lenders can be fully explained in terms of demand-side factors, including the varied credit characteristics of homebuyers and homeowners in different neighborhoods. *If there is evidence that subprime lenders penetrate places in ways that cannot be justified on the basis of borrower risk, and if this geographical targeting is associated with clusters of mortgage preforeclosures, then there is strong circumstantial evidence to support claims of targeting and predatory market behavior.* The remainder of this paper presents a series of multivariate analyses to evaluate this hypothesis, choosing variables in order to giving every possible benefit of the doubt to the supply side. The general approach is to determine whether Figure 4 can be explained solely in terms of applicant characteristics -- or if supply-side practices also play a role.

A Model of Subprime Selection

Consider a logistic regression to predict the likelihood that an individual borrower decides to request a loan from a subprime institution:

$$\ln\left[\frac{P_{Subprime}}{1 - P_{Subprime}}\right] = \beta_0 + \beta_A A_i + \beta_M M_i + \beta_L L_i + \beta_Y Y_i + \beta_N N_i + e_i$$

[1]

In this model, A_i represents a vector of applicant characteristics, most importantly income and creditworthiness. Applicant sex, race, and ethnicity are also important determinants of subprime segmentation.[8] M_i is a vector of mortgage loan characteristics and criteria, including loan amount, FHA insurance, and the borrower's proposed debt burden. L_i is a set of lending institution characteristics, and Y_i captures annual fluctuations in market conditions. Finally, N_i measures neighborhood variations in subprime selection that persist after accounting for all other applicant, loan, and lender variables.

We estimated Equation 1 with HMDA loan records between 1993 and 1999 (Federal Financial Institutions Examination Council, 1994-2000). The database includes all applications for purchase, home improvement, and refinance loans on single-family houses located in the Newark Metropolitan Statistical Area (MSA). Loan records are excluded if the requested loan amount exceeds the conforming limits established by Fannie Mae and Freddie Mac. To calibrate Equation 1, we exploit all relevant available information in the mortgage disclosure files. Variables are coded for income, loan amount, FHA insurance, sex, race/ethnicity, and many other measures commonly used in the discrimination literature. The information in the HMDA files is limited, of course, and the absence of data on critical, legitimate underwriting criteria (such as an applicant's credit score) has sustained long-running debates over discrimination and redlining. Efforts to match the public-release files with additional, proprietary data, however, have not fundamentally altered interpretations based on HMDA alone (see Browne and Tootell, 1995; Munnell et al., 1992, 1996). Nevertheless, we take the most conservative approach possible in designing a model and defining variables. Four points merit attention. First, the

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[8] Although clearly illegal when used to steer prospective borrowers to certain lenders or types of credit, such demographic markers may be correlated with systematic differences in borrower choice. The same observed pattern, however, can be interpreted in opposite ways. Conservative analysts are quick to point out, for instance, that minorities (who, as a group, have lower incomes and poorer credit records) are more likely to respond to

framework of Equation 1 is designed to model borrowers' choices among financial institutions --

not to replicate the standard accept/reject decision that has generated so much controversy in the

discrimination literature (LaCour-Little, 1999; Turner and Skidmore, 1999). Accordingly,

indicators for the decisions rendered on applications can be used as right-hand-side variables.

Decisions reported in the files include approval and origination; approval, followed by a

borrower's refusal of the offer; denial; withdrawal; and closure as incomplete. This approach

implicitly justifies a lender's decision as if it were an unbiased, accurate assessment of an

individual's credit history -- thereby minimizing the possibility of any finding of racial (or

geographic) discrimination. Second, we develop a measure of each borrower's proposed debt

burden in order to gauge the risks of highly-leveraged homeowners. We calculate the borrower's

monthly principal and interest payments on the requested loan amount, expressing this as a

percentage of the applicant's income. The payment amortization is based on prevailing interest

rates for conventional, 30-year fixed-rate loans, and thus does not capture the substantially

higher costs of FHA and subprime credit. The payment ratio also provides no information on

downpayments, up-front points and fees, or non-housing debt payments (used by underwriters to

calculate the "back-end ratio" of total debt service to income). Still, the payment ratio is a major

improvement over many HMDA-based analyses, and it does measure broad variations in

borrowers' debt loads. Third, institutional effects are measured with a simple set of dummies for

the four main regulators supervising depository institutions.[9] Although this is a vicious

oversimplification of the industry (cf. Dymski, 1999), it does capture the most important division

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advertising that emphasizes easy credit. But consumers can only respond to advertising that has been distributed, and aggressive marketing strategies lie in the province of corporate decisions, not consumer choice.

[9] The regulatory dummies denote the Office of the Comptroller of the Currency (OCC), the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC), and the Office of Thrift Supervision (OTS). The HMDA files also identify credit unions supervised by the National Credit Union Administration, but none of these lenders in our study area specialize in subprime loans. Mortgage company subsidiaries of banks or thrifts are required to

-- between deposit-taking banks and savings and loan institutions, and mortgage companies that derive all of their revenues from mortgage loans.

The fourth and final methodological note pertains to the measurement of geographical divisions. Two complementary approaches help to identify areas where the market penetration of subprime lenders cannot be explained solely in terms of borrower characteristics. To measure cross-city variations, a vector of dummies is coded for each of the 22 municipalities in Essex County; the remaining suburban counties of the MSA serve as the reference category. At a finer spatial resolution, dummies are coded for every census tract in the county, again taking the western suburban fringe of the MSA as the reference category.

Results

All of the models achieve robust fit to the observed data (Table 1). The pattern of coefficient estimates is striking. Although a wide variety of individual and institutional characteristics help to explain how certain households find themselves at a subprime lender, the single most important factor is time (see the standardized coefficients for the annual dummies). Across all submarkets, subprime lenders achieved remarkable penetration as the 1990s wore on. Inspection of the raw data reveals that between 1993 and 1999, subprime market share ballooned from 1.0 percent to 10.5 percent for purchase applications, from 13.4 percent to 42.4 percent for home improvement requests, and from 2.8 percent to 43.0 percent for refinance applications. Subprime institutions have attracted a steadily growing number of applications, regardless of interest rates and general economic conditions; periodic declines in the attractiveness of prime conventional terms, therefore, tend to amplify the growth in subprime activity. Rising interest

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report to their "parent" institution's regulator. Non-depository, independent mortgage companies (the reference category for the model) are regulated by the U.S. Department of Housing and Urban Development.

rates in 1997, for example, retarded prime refinancing, while continued expansion of the subprime market gave these lenders almost half (48.7 percent) of all refinance activity in the study area; the prime market recovered the next year, but applications to subprime institutions continued to boom (from 12,534 in 1997 to 22,882 in 1999). The logit models confirm that this dramatic shift in the market cannot be explained solely by an influx of low-income or risky applicants. Even after accounting for a wide variety of borrower and institutional characteristics, the local market saw a decisive shift away from prime lenders. The odds of subprime choice for a home improvement or refinance application were nearly forty times higher in 1999 compared with identically-qualified borrowers entering the market only six years earlier. At least some of this expansion is attributable to changes in HMDA coverage of subprime institutions (Scheessele, 1999). Still, the sheer magnitude of the time effect underscores the pace and depth of change in the local and national credit markets, as agents of capital investment discovered a lucrative profit opportunity in the favorable economic climate of the late 1990s.

Consumer Choice or Industry Strategy?

After accounting for annual shifts in market composition, several other factors stand out as important determinants of segmentation. The findings provide strong but notably partial support for the diametrically opposed explanations offered in the literature. On the one hand, the coefficient estimates for most of the applicant-level characteristics corroborate the neoclassical interpretation. All else constant, subprime choice is significantly more likely among low-income borrowers, and among those who are eventually turned down. Renovation requests that are eventually rejected are twice as likely to be filed at a subprime lender compared with otherwise identical applications that are approved and originated; the odds ratio jumps over 3.0 for home

purchase loans, and to 3.5 for refinance applications. Results for debt burdens are mixed,

however. Among homebuyers, higher debt ratios reduce the odds of subprime choice; yet it is

possible that this unexpected finding results from the omission of key variables on

downpayments, closing costs, "silent second" mortgages available to some low-income families,

and other financial parameters that probably bias the simple debt measure used here. Among

those who already own their homes, however, debt burdens do have the hypothesized effects.

Compared to an owner with an average debt ratio, a one standard deviation increase in the

borrowing load increases the odds of subprime choice by 18.7 percent for home improvement

loans, and 12.9 percent for refinance requests. For homeowners, the models paint a picture of

lenient, flexible lenders serving the credit needs of families who find themselves overextended --

either in housing debt, or consumer debts that can be paid off through a cash-out refinance.[10]

Judging by the loan decision variables, the owners who turn to subprime lenders have difficulty

gaining the approval of underwriters; but they undoubtedly have a better chance of obtaining

credit at a subprime institution than at a conventional, prime bank. Moreover, the models

suggest that these financial constraints and other factors make lenient credit particularly

important for racial and ethnic minorities. All else constant, African Americans have odds of

subprime choice approximately twice as high as non-Hispanic Whites in the home purchase and

refinance markets; this preference is somewhat less pronounced among Hispanics. The

prevailing interpretation of such racial differences -- gaps that persist after accounting for all

other effects in the model -- invokes the problem of omitted variable bias. Pennington-Cross,

Yezer, and Nichol (2000, p. 1), for example, use this issue to explain the persistence of racial

segmentation into subprime credit: "It is extremely difficult, if not impossible, to include all of

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[10] Unfortunately, HMDA does not require disclosure of applications for home equity lines of credit, where predatory abuses have flourished in recent years. Lenders have the option of reporting these loans if a portion of the proceeds

the variables that go into a loan decision.... Data used in the study may suggest, for instance, a prime market candidate, based on income, while the actual household may have secured a no-documentation loan available only in the subprime market."

All of the pillars supporting this interpretation, however, are weakened by the weight of institutional-level factors. Three findings point directly to the role of the industry in segmenting the local credit market. First, the standardized coefficients indicate that institution-level divisions overshadow borrower-level explanations of subprime choice. Nationally, most subprime lenders are independent mortgage companies; but many commercial banks establish or purchase specialized, high-risk subsidiaries (who therefore file HMDA reports with the regulator who supervises their "parent" bank). The models reveal extremely low odds ratios for subprime selection at any institution supervised by one of the depository regulatory agencies, compared with independent mortgage companies. Second, there is no clear link between market segmentation and borrowers risky enough to be turned down specifically for credit history. When underwriters turn down a loan request, they may report up to three reasons for their decision. Most of the regulatory agencies regard these denial codes as optional, however, thus introducing selection bias into the analysis; but in light of the intense public scrutiny of discrimination in the 1990s, lenders have strong incentives to justify their rejections with the most common (and reasonable) criterion. The absence of any meaningful link between bad-credit denials and subprime choice casts doubt on the assumption of a high-risk applicant pool. Third, the racial disparities evident in the segmentation models are vulnerable to severe bias. Racial divisions can be interpreted in terms of consumer choice, but they also provide evidence of targeting strategies by lenders, brokers, or home improvement contractors. The latter interpretation is bolstered by the disproportionate "choice" for subprime lenders by applicants

is used for home repair, rehabilitation, or remodeling (see Federal Reserve Board, 2000, p. 78).

without information on race/ethnicity. Home purchase applicants without reported racial information are more than four times as likely to wind up at subprime institutions. Applicants may decide not to provide this information, but the rapid rise in non-disclosure ("unknown" is now the second-largest racial/ethnic group in HMDA overall) coincided with the expanding market share of subprime institutions using targeted, direct mail or telephone solicitations (where lenders are not required to collect race/ethnicity information) (Huck, 2001; Wyly and Holloway, 2002a, 2002b). The selection mechanisms slotting racially "invisible" borrowers into subprime credit, therefore, can be understood as omitted-variable bias concealing the industry's target marketing techniques in low-income, minority communities.

Spatial Segmentation

Our analysis is vulnerable to the widely-recognized limitations of HMDA-based studies. The smallest lenders are not required to file HMDA records, and the limited information in the files creates substantial omitted-variable bias. The inclusion of the decision variables mitigates this bias somewhat. But if critics can still charge that the coefficients on the race/ethnicity variables omit credit characteristics not captured in lenders' self-interested rejection decisions, then the same trope cannot be used also to dismiss *geographical* divisions. Given the extensive list of borrower and loan characteristics included in the models, only the most talented econometric acrobatics can justify the suggestion that remaining spatial disparities in lending are *also* the fault of borrowers. Geographical variations in the likelihood of subprime "choice," therefore, offer conservative and robust evidence of lending industry strategies -- marketing, advertising, broker and correspondent networks, and other business decisions that are not captured by publicly available data.

We can best appreciate the spatiality of high-risk capital investment by examining two

scales. At the city level, the analysis confirms the severity of problems in Newark and its nearby

rings of suburbs. Compared to an identical applicant in the western suburbs of the MSA, a

homebuyer in Newark is 2.7 times more likely to choose a subprime institution. The ratio is

even worse in the distressed suburbs of Orange, East Orange, and Irvington, while the problem is

somewhat less severe in a crescent of a half-dozen inner-ring suburbs. As expected, suburbs in

the western half of Essex County (those at the bottom of the list in Table 1) are indistinguishable

from the suburban counties to the west. A similar pattern prevails in the home improvement

market, with less pronounced divisions anchored on the city of Orange (which has an odds ratio

higher than that of Newark). In the refinance market, segmentation odds are highest in East

Orange, Newark, and Irvington; subprime selection is significantly lower than the western

suburban counties in a tier of affluent commuter suburbs -- from Cedar Grove in the north,

through Verona, Essex Fells, Roseland, Livingston, and to Millburn on the county's southern

edge.

In reality, capital market flows are much more fine-grained than the city scale. We can

see these patterns if we replace the municipality variables with a vector of tract dummies,

mapping the odds ratios that retain statistical significance (P<0.05) (Figure 5). The patterns are

striking. In all cases, there is an unmistakeable subprime bias in Newark and its surrounding

first-ring suburbs, while the western suburbs are indistinguishable from (or even more free of

subprime capital than) the rest of the MSA. The precise contours of the pattern, however, vary

considerably by loan purpose. Home improvement segmentation traces out several distinct

clusters with odds ratios over 2 or 3, suggestive of unique configurations of the housing stock or

particular arrangements among enterprising lenders, brokers, and contractors. Refinance capital

highlights a broad swath of aging suburbs where subprime odds are moderately higher than for identical borrowers in the remaining parts of the MSA, implying that there are abundant opportunities to reap the profits associated with subprime loan terms; but the most extreme segmentation (where odds ratios are over 2 or 3) pervades those neighborhoods inside the city of Newark with relatively large cohorts of African Americans with accumulated housing equity. Home purchase lending traces out the clearest spatial patterns, with high-risk capital gravitating to neighborhoods of two- and three-story single-family homes built in the construction cycles before the First World War and during the 1920s. In light of the distinctive calculus of home-purchase lending (which offers opportunities for above-average fees and points, but provides few avenues to the equity-stripping profits of home equity credit) it is not entirely clear how damaging the subprime boom will be for buyers in these aging, early-twentieth century streetcar suburbs. But it is quite evident that subprime capital investment displays a fine-grained spatiality, and that this pattern cannot be explained solely in terms of borrower choice.

An Ecology of Preforeclosure

The evidence thus far indicates that 1) mortgage delinquencies are heavily concentrated in low- and moderate-income neighborhoods in Newark and its first-ring suburbs; and 2) anyone who owns or buys a home here faces a substantially higher likelihood of winding up with subprime credit even when compared with an identical borrower in the affluent, mostly-white suburbs to the west. A crude way to link these two findings is to compare two aggregate rates for each census tract in Essex County: the 1999 preforeclosure rate of single-family loans originated between 1993 and 1998, and the share of 1993-1998 loans that were granted by subprime lenders. The ecological correlation of these two rates is certainly suggestive (Figure

6). Preforeclosure rates rise with subprime market penetration, and the relationship appears fairly strong if we ignore several outliers (all of them tracts with very few loans granted over the six-year period). Nevertheless, this evidence is indirect and circumstantial. Establishing a direct link between credit segmentation and neighborhood distress requires estimating the separate preforeclosure rates of loans made by prime and subprime lenders.

We obtain these estimates by using Gary King's maximum-likelihood ecological inference techniques (see King, 1997, 2000, and Fotheringham, 2000). Following King's terminology for our case, we know the proportion of loans between 1993 and 1998 that were made by subprime lenders (X_i), the share granted by prime lenders (1- X_i), and the proportion of all reported loans that lapsed into preforeclosure during 1999 (T_i). Countywide, T stands at only 1.27 percent. To obtain tract-specific estimates of rates for subprime (β_i^b) and prime (β_i^w) lenders, we used King's (2000) publicly-available PC software. In our first maximum-likelihood estimates, the preponderance of small numbers in our dataset yielded no convergence; imagine a cluster of lines in the lower-left-hand corner of the unit square, with the bivariate normal distribution biased by a few lines falling on either axis. King (1997, pp. 129-130) outlines several ways to deal with the resulting uncertainty, which is known as the "ill-posed inverse problem." We excluded 14 tracts with fewer than 25 loans granted in the 1993-1998 period, and repeated the procedure on the remaining 206 tracts. At this stage we restricted the maximum likelihood estimation to those tracts where the preforeclosure rate was within the range 0.001-0.999 (see the documentation for King, 2000); the function was thus estimated on 86.4 percent of the 206 tracts, although β_i^b and β_i^w can still be obtained for the remaining tracts at the extremes. Using the criteria outlined in King's (1997) full-length discussion and software documentation (2000), our model fits well, with normal convergence of the function without excessive

resampling or problematic tomography anomalies. The *aggregate* bounds for the countywide subprime foreclosure rate are 0 to 9.55 percent, and for prime lenders they are 0 to 1.45 percent.

The tomography plot for our analysis is presented in Figure 7. Note that the figure is zoomed in on the lower-left-hand corner of the unit square, since the range of possible rates is restricted and generally close to zero. Each line on this graph portrays the possible combinations of preforeclosure rates for subprime (β_i^b) and prime (β_i^w) loans in a particular tract *i*; these bounds are mathematically determined by the total number of loans, the number of *lis pendens* filings, and the subprime share of loans observed in each neighborhood. The maximum likelihood framework yields point estimates and confidence intervals for the pattern of β_i^b and β_i^w combinations that are most likely to have produced the criss-cross arrangement of lines shown in the tomography plot. Eighty percent of the estimated points (each with coordinates β_i^b, β_i^w) lie inside the small curve at the bottom of the graph, and 95 percent lie within the larger curve; both curves are pushed low and wide, signifying very low estimates on the y axis (β_i^w, the prime rate) and higher but varied estimates on the x axis (β_i^b, the subprime rate).

It is a fairly simple matter to draw confidence intervals around the estimates for the separate rates. We can then visualize the results in two complementary ways, while giving every benefit of the doubt to the subprime industry. First, consider the spatial pattern of subprime rates (see top panel, Figure 8). We mapped the lower end of the 95 percent confidence interval of the β_i^b and β_i^w estimates, meaning that we are 95 percent sure that the actual subprime preforeclosure rates are at least as high as those shown on the map. The pattern is striking. The western half of the City of Newark is pockmarked by more than a dozen neighborhoods with rates over 10 percent; at least one in ten of the subprime loans granted between 1993 and 1998 were destined for delinquency and a *lis pendens* in 1999. This troubling pattern is even clearer in the north-

south swath of interwar, first-ring suburbs stretching from Irvington, through Newark's Vailsburg section, to the distressed city of East Orange. Subprime preforeclosure rates decline rapidly as one moves westward from this ring, dipping well below the countywide average in the affluent, mostly-white suburbs. A second piece of evidence is even more compelling. Since it could be argued that any lender venturing into the East Orange and Newark faces high risks, we calculated the difference in β_i^b and β_i^w estimates. For each tract, we subtracted the *upper* limit of the 95 percent confidence interval for the prime preforeclosure rate from the *lower* limit of the subprime interval; we can be quite certain, therefore, that the difference in rates is at least as large as that shown on the bottom panel of Figure 8. Again, the results are striking. The pattern is quite close to that shown in the top panel, although prime rates do exceed subprime rates in some of the western suburbs. In Newark and the first tier of early-twentieth century suburbs, however, the pattern provides clear evidence of segmentation in mortgage capital investment. Not all lenders who do business in these markets experience high preforeclosure rates. Prime rates generally fall below 2 or 3 percent in these neighborhoods, while for subprime lenders the rate is at least 12 percent, and in many cases over 15 or 20 percent.

Discussion

The analysis presented in this paper suffers from severe limitations. Not all lenders file HMDA reports; many defaults lead to property assignments with no legal action or preforeclosure notice; HUD's subprime list is only an approximation, while of course "subprime" does not equal "predatory"; and HMDA records are inadequate to capture the complexity of credit risk and mortgage choice. The conservative interpretation, therefore, is to dismiss the findings as self-evident confirmation that the market works -- subprime lenders serve the highest

risk, and thus we see the worst preforeclosure rates in those areas with risky borrowers served by risk-taking lenders. And the market *is* working -- to the benefit of brokers, home improvement contractors, investors, appraisers, and lenders (Drysdale and Keest, 2000; Engel and McCoy, 2002). But *borrowers* only benefit if they enter into loan agreements voluntarily, and as well-informed participants. There is abundant evidence that these assumptions are routinely violated, especially in urban African American neighborhoods. The deeply-entrenched history of racism in employment, education, and housing markets is formally legitimated in traditional banking practices and proprietary measures of creditworthiness; the lingering effects of 'classical' redlining and the proliferation of institutions not covered by CRA suppresses prime competition (Dymski, 1999); and thus the durable racial inequality of urban structure magnifies economic incentives for asset-based lending and transactional profits, encouraging the use of sophisticated deceptive practices (some of theem illegal, others unregulated) (Drysdale and Keest, 2000; Engel and McCoy, 2002; HUD-Treasury Joint Task Force, 2000; OCC, 2002; White and Mansfield, 2002). Our maps reveal what would be expected on the basis of the economic rationality of targeting -- subprime penetration is greatest in segregated African American neighborhoods suffering from years of middle-class outmigration and disinvestment by mainstream banks, but where there are concentrations of homeowners in aging homes with significant home equity. In this sense, the entire analysis is a case of omitted-variable bias -- but the missing variable is not applicant credit, but the accumulated legacy of American race relations, which sustain the rationality of exclusion in wealthy white suburbs (where whites' fears of racial change threaten property values) even while creating predatory profit opportunities in African American communities.

It is possible that none of these results stem from causation: perhaps certain lenders tend to do business in those areas where delinquency, default, and preforeclosures are already common. Such an interpretation cannot be evaluated with the limited public data available, but it is certainly plausible. Yet such an explanation indirectly supports the notion of targeting: if the subprime industry is not *causing* preforeclosures but is undeterred by areas with these risks, the strong suggestion is that the industry is making profits from something other than sustainable, healthy market activity. The key finding of the multivariate analysis -- which incorporates lenders' own risk assessments in their rejection decisions -- is that the spatial competition between prime and subprime mortgage capital cannot be blamed solely on homeowners and homebuyers. The shifting calculus of high-risk capital investment is also crucial.

Conclusions

Many of those served by the sub-prime market are creditworthy borrowers who are simply stuck with sub-prime loans or sub-prime lenders because they live in neighborhoods that have too few credit or banking opportunities.

Ellen Seidman, Director of the Office of Thrift Supervision (2000).

We must target not just the predators themselves, but conditions that allow them to flourish. That means encouraging responsible competition in the same markets in which the predators operate.

John D. Hawke, Jr., Comptroller of the Currency (2000).

The analysis presented in this paper reveals close links between geographical patterns of subprime market segmentation and the incidence of loan preforeclosures, and indicates that the

characteristics of borrowers provide insufficient explanation for spatial segmentation. Institutional characteristics are more important, corroborating theories of the economic rationality of racial-geographic targeting and the incentives for predatory market behavior.

Five implications emerge from our analysis. First, we must strengthen the response to current and future waves of foreclosures in urban and minority communities. We need increased public investment in loss mitigation programs and emergency interventions, but we also need sustained activism and regulatory prodding to enforce the responsibility of subprime and prime lenders. Citigroup is only the largest prime institution willing to protect its corporate nameplate by reluctantly making amends for the shocking predatory abuses involved in some of the loans it acquired in a takeover of a smaller, subprime lender (Oppell and McGeehan, 2000); several large subprimes have also agreed to compensation or changes in practices (e.g., Household International, Ameriquest; Bergquist and Blackwell, 2002). Second, we need to shift the burden of proof from the borrower to the lender (and broker, contractor, appraiser, and investor). It is a common refrain to dismiss HMDA-based studies because of the lack of borrower credit information; we also need more public information on the creditworthiness, motives, and financial responsibility of those who stand to profit from predatory practices (Taylor and Silver, 2001). Third, the rules must be changed to eliminate the incentives for predatory behavior. Lenders have become quite creative at juggling various loan terms to avoid the triggers of the Home Ownership Equity Protection Act of 1994. And recent years have seen a partial regulatory devolution, as states and cities have stepped in to address the vacuum left in the wake of a federal deregulatory zeal that culminated in the Gramm-Leach-Bliley Financial Services Modernization Act of 1999 (the repeal of Depression-era banking regulations that was led by Senator Phil Gramm, who now represents Swiss bank accounts; see Langley, 2002; McGeehan,

2002; Dymski, 1999). Various forms of anti-predatory legislation have passed in California, Connecticut, Georgia, Illinois, New York, North Carolina, Pennsylvania, Texas, Virginia, and Washington, DC (Mosher and Foster, 2002). The banking lobby, experiencing an epiphany on the virtues of federal oversight, has raised the specter of a confused patchwork of state regulations (or indeed any restrictions) shutting off all credit to those whom the policies are trying to protect. This is certainly a serious concern. But preliminary evidence that regulations are not restricting credit flows comes not just from liberal advocacy organizations, but from less-than-radical authorities such as Morgan Stanley (Posner and Meehan, 2002, who were told by surveyed lenders that some of the resulting lending practices and disclosure requirements "are customer-friendly and appear to be helping sales," p. 9) and Federal Reserve Governor Edward Gramlich, speaking to the American Enterprise Institute (Lagomarsino, 2002; Lockyer, 2002). Fourth, the damages of predatory targeting can be reduced by beating the predators to market -- through expanded alternative products (being developed and refined by nonprofits, state and local governments, and the GSEs) and enhanced financial education.

Finally, a fifth implication suggests an honest and critical reassessment of the limits to housing capital, even in its heyday of the go-go 1990s. Not long ago, questioning the assumptions of American homeownership policy was about as fashionable as doubting the unlimited bounties of dot-com capitalism. The same is true today, which means that we are now seeing the housing policy equivalent of WorldCom-style earnings restatements, in the form of cautious policy analyses (Retsinas and Belsky, 2002) as well as popular press post-mortems (compare Cassidy's [1997] piece on corporate executives reading Marx, in the "Millennial Issue" of *The New Yorker*, with his more recent anticipation [2002] that the housing bubble might burst). However well-intentioned, the expansion of homeownership to new markets in the 1990s

had its limits, because the primary benefit of property rights is that they are exclusionary: if more people get them, they must be diluted for some (e.g., poorer appreciation rates, worse public services) or maintained by extracting more resources from those who don't have them (i.e., renters). Both happened (Belsky and Duda, 2002; Case and Marynchenko, 2002; Stegman et al., 2000). Predatory lending simply represents one more axis of widened inequalities among homeowners. Housing analysts, therefore, need to adapt and refine theories and methods to monitor the dynamic relations between old and new forms of disinvestment, discrimination, and redlining -- and to point out the policy and political failures to challenge these problems. In previous generations, African American neighborhoods were marginalized by disinvestment and capital flight; now, the remants of old problems are overlain with new patterns, as high-risk mortgage capital finds lucrative profits by exploiting the history of marginalization and credit rationing. Community activists and residents working, living, and organizing in the new landscapes of predatory capital understand only too well that discrimination and disinvestment are no longer just about exclusionary redlining, but also about exploitative greenlining.

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Table 1. Subprime Loan Segmentation Models, Essex County, 1993-1999.

Variable	Home Purchase			Home Improvement			Refinance		
	Parameter Estimate	Odds Ratio	Std. Coeff.	Parameter Estimate	Odds Ratio	Std. Coeff.	Parameter Estimate	Odds Ratio	Std. Coeff.
Intercept	-3.492 ***	.		-0.3745 ***	.		-3.4166 ***	.	
Applicant income ($1,000)	-0.00171 ***	1.00	-14.8	-0.0013 ***	1.00	-10.2	-0.00366 ***	1.00	-30.7
Loan amount ($1,000)	-0.00821 ***	0.99	-32.5	-0.00276 ***	1.00	-7.4	-0.00363 ***	1.00	-17.6
Amortized payment ratio	-0.00499 ***	1.00	-11.7	0.019 ***	1.02	18.7	0.00523 ***	1.01	12.9
Payment ratio squared	0.0000005029	1.00	1.2	-0.00006 ***	1.00	-34.8	-0.00001 ***	1.00	-21.7
FHA-insured loan	-2.1629 ***	0.12	-56.8	-0.1259 **	0.88	-4.0	-3.0113 ***	0.05	-31.7
Owner-occupied	-0.3247 ***	0.72	-6.3	0.00239	1.00	0.0	0.0437	1.05	0.9
Traditional white family couple	-0.2373 ***	0.79	-10.7	-0.3457 ***	0.71	-13.7	-0.3691 ***	0.69	-16.1
Female applicant	-0.0661 *	0.94	-2.7	-0.1673 ***	0.85	-6.6	0.016	1.02	0.6
Applicant sex unreported	-0.7709 ***	0.46	-17.7	-0.0419	0.96	-1.8	-0.4464 ***	0.64	-16.2
Native American / Alaska Native	0.6707 ***	1.96	3.9	-1.2348 ***	0.29	-7.7	-0.0552	0.95	-0.3
Asian or Pacific Islander	-0.3247 ***	0.72	-5.9	-1.4258 ***	0.24	-17.2	-0.7991 ***	0.45	-12.1
Black	0.7429 ***	2.10	29.4	-0.0444	0.96	-1.4	0.619 ***	1.86	19.2
Hispanic	0.3673 ***	1.44	10.4	-0.2119 ***	0.81	-5.1	0.1646 ***	1.18	3.1
Other	0.997 ***	2.71	12.1	0.0484	1.05	0.7	0.7204 ***	2.06	8.8
Race unreported	1.4393 ***	4.22	55.9	0.2929 ***	1.34	14.8	1.3401 ***	3.82	84.9
Race not applicable	1.9084 ***	6.74	15.3	2.0522 ***	7.79	22.3	2.5501 ***	12.81	32.5
Edit failure code	1.9131 ***	6.77	75.3	0.4373 ***	1.55	14.7	1.475 ***	4.37	60.4
1994	1.5304 ***	4.62	67.3	0.3459 ***	1.41	12.6	2.1505 ***	8.59	91.9
1995	1.7571 ***	5.80	76.7	1.7355 ***	5.67	80.6	2.6196 ***	13.73	84.8
1996	2.205 ***	9.07	112.4	1.8646 ***	6.45	89.7	2.7794 ***	16.11	127.4
1997	2.669 ***	14.43	154.5	2.0429 ***	7.71	111.6	3.5911 ***	36.27	208.1
1998	2.8355 ***	17.04	193.1	2.6998 ***	14.88	176.0	3.2362 ***	25.44	295.1
1999	2.8441 ***	17.19	208.0	3.6005 ***	36.62	302.8	3.6404 ***	38.11	361.1
Application denied	1.1063 ***	3.02	36.9	0.7037 ***	2.02	39.7	1.256 ***	3.51	62.8
Approved, declined by applicant	1.4334 ***	4.19	35.1	0.9962 ***	2.71	37.6	1.2669 ***	3.55	41.9
Withdrawn	1.0623 ***	2.89	32.0	1.1682 ***	3.22	35.0	1.4113 ***	4.10	54.5
Application closed incomplete	1.1063 ***	3.02	13.5	-0.571 ***	0.57	-6.0	1.3568 ***	3.88	27.3
Denied for bad credit	0.4234 ***	1.53	6.5	-0.1288 **	0.88	-4.0	-0.6074 ***	0.55	-12.1
OCC-regulated lender	-3.6028 ***	0.03	-76.4	-4.3664 ***	0.01	-88.3	-2.725 ***	0.07	-68.3
FRB-regulated lender	-2.1752 ***	0.11	-53.7	-4.0426 ***	0.02	-71.8	-1.665 ***	0.19	-44.4
FDIC-regulated lender	-1.941 ***	0.14	-43.7	-9.7454 ***	0.00	-93.4	-3.4045 ***	0.03	-59.6
OTS-regulated lender	-2.6468 ***	0.07	-61.3	-5.1984 ***	0.01	-84.1	-2.6707 ***	0.07	-59.6

(continued)

Table 1. (continued)

Variable	Home Purchase			Home Improvement			Refinance		
	Parameter Estimate	Odds Ratio	Std. Coeff.	Parameter Estimate	Odds Ratio	Std. Coeff.	Parameter Estimate	Odds Ratio	Std. Coeff.
Newark	0.986 ***	2.68	27.1	0.2454 ***	1.28	7.7	0.6674 ***	1.95	19.1
East Orange	1.2161 ***	3.37	18.0	0.4447 ***	1.56	9.2	0.7058 ***	2.03	12.7
Irvington	1.0741 ***	2.93	17.3	0.4425 ***	1.56	8.5	0.5618 ***	1.75	9.8
Nutley	-0.1215	0.89	-1.2	-0.11	0.90	-1.2	0.0612	1.06	0.7
Belleview	0.275 **	1.32	3.4	0.5527 ***	1.74	7.6	0.2755 ***	1.32	3.5
Bloomfield	0.3457 ***	1.41	5.4	0.5405 ***	1.72	8.1	0.2853 ***	1.33	4.3
Glen Ridge	0.0405	1.04	0.3	-0.0647	0.94	-0.4	-0.1693	0.84	-1.2
Montclair	0.3289 ***	1.39	4.4	0.2215 *	1.25	2.8	0.1429 **	1.15	2.0
West Orange	0.2399 ***	1.27	4.4	0.232 **	1.26	3.5	-0.0606	0.94	-0.9
Orange	1.0208 ***	2.78	10.7	0.6669 ***	1.95	8.6	0.6482 ***	1.91	7.3
South Orange	0.2692 **	1.31	2.7	-0.0249	0.98	-0.2	0.1161	1.12	1.1
Maplewood	0.1334	1.14	1.8	0.5505 ***	1.73	7.3	-0.0428	0.96	-0.5
Millburn	-0.3284	0.72	-2.3	-0.5313 **	0.59	-4.5	-0.5813 ***	0.56	-5.0
Livingston	0.2366 *	1.27	2.8	-0.3935 **	0.68	-4.5	-0.205 ***	0.82	-2.6
Essex Fells	-1.1159	0.33	-2.8	-1.1169 *	0.33	-3.4	-0.6913 *	0.50	-2.1
Roseland	-0.1529	0.86	-0.9	0.21	1.23	1.0	-0.3549 *	0.70	-1.9
Verona	-0.2449	0.78	-2.3	-0.0894	0.92	-0.7	-0.154 *	0.86	-1.4
Cedar Grove	-0.1029	0.90	-0.7	-0.3964 *	0.67	-3.0	-0.2087 *	0.81	-1.7
Fairfield	0.016	1.02	0.1	-0.2707	0.76	-1.8	-0.019	0.98	-0.1
North Caldwell	-0.0855	0.92	-0.4	0.2383	1.27	1.2	-0.2475	0.78	-1.4
Caldwell	-0.4147	0.66	-2.6	-0.4445	0.64	-2.5	-0.1399	0.87	-0.8
West Caldwell	0.1823	1.20	1.4	-0.4245 *	0.65	-3.0	-0.1778 *	0.84	-1.5
–2 Log Likelihood	56,614			44,888			159,123		
Chi-square vs. null model	32,318 ***			44,981 ***			124,837 ***		
Chi-square vs. model without municipalities (ΔDF=22)	1,196 ***			299 ***			1,498 ***		
Number of observations	181,132			73,950			233,071		
Percent correctly classified	90.2			93.0			91.1		
Unconditional subprime share	6.7			29.6			29.8		

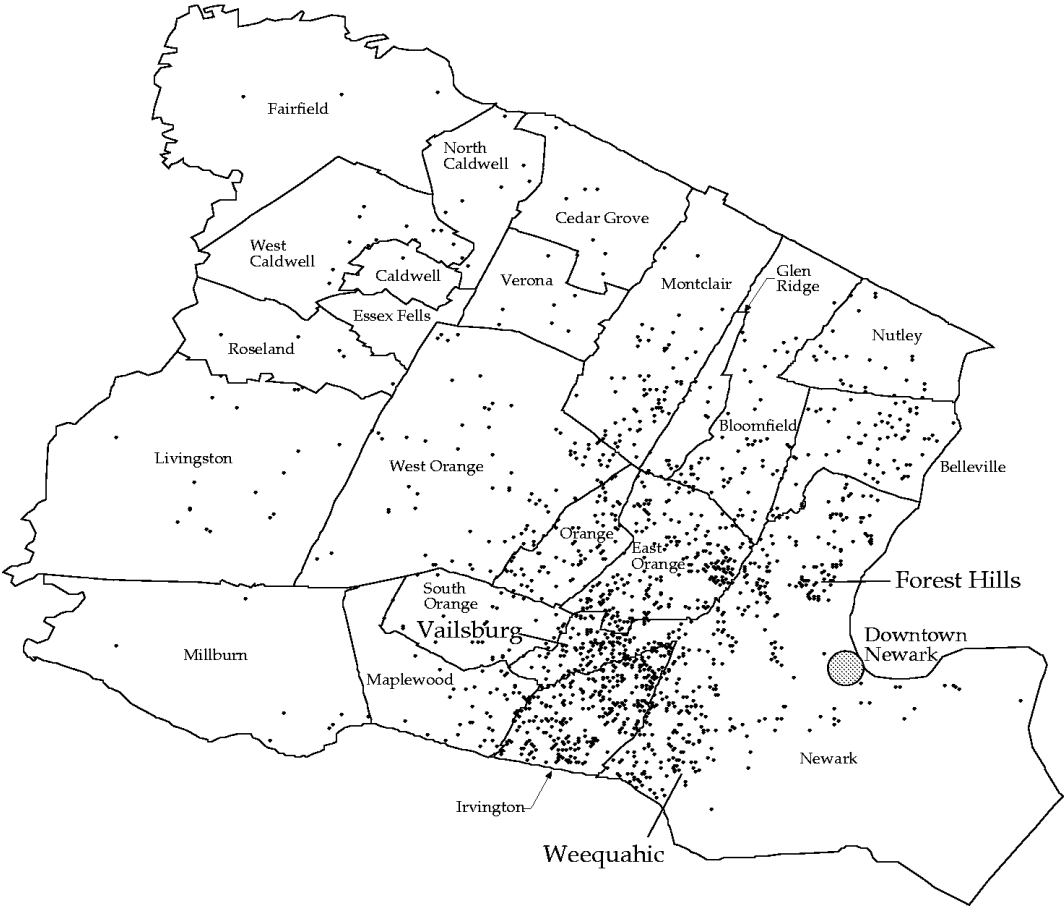*Significant at P<0.05; **P<0.01; ***P<0.001.

Data Source: FFIEC (1994-2000), Scheessele (2000).

Figure 1. The Newark Metropolitan Statistical Area (MSA) and Essex County, New Jersey.
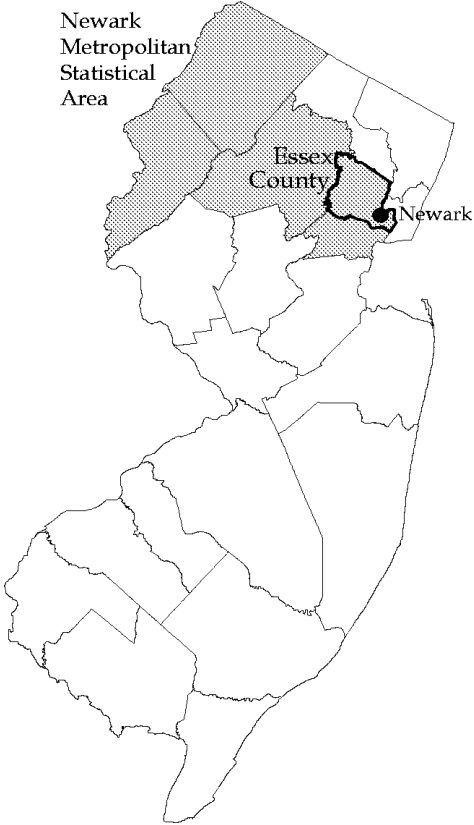
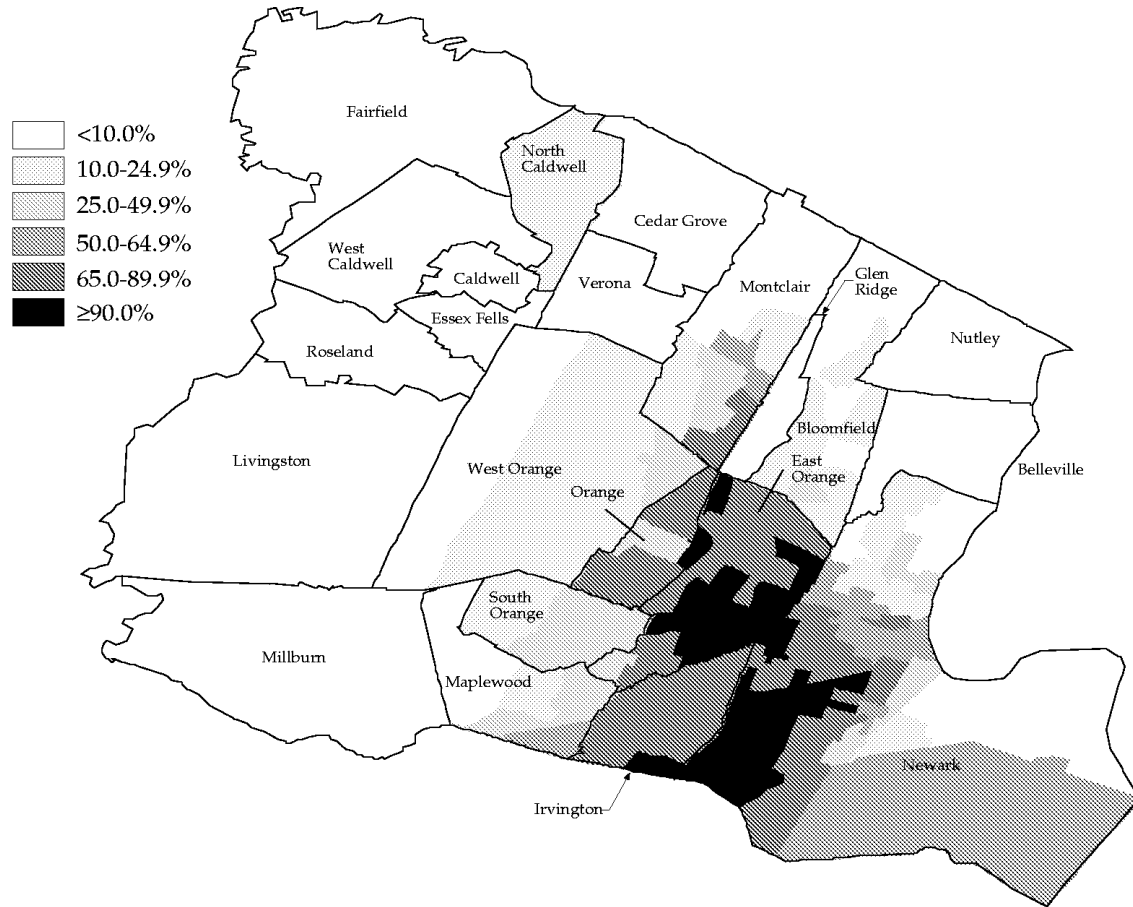**Figure 2.** *Lis Pendens* notices filed between August 7, 2000 and August 7, 2001.

*Source:* American Foreclosures, Inc. (2001).

Figure 3. African Americans as share of total population, 2000, by census tract. (Share of respondents choosing "Black only;" excludes respondents choosing two or more races.)

Source: U.S. Bureau of the Census (2002).

Figure 4. Estimated 1999 preforeclosure rate for conforming single-family loans originated between 1993 and 1998, by census tract.

Source: American Foreclosures, Inc. (1999); FFIEC (1994-1999); Scheessele (1999).
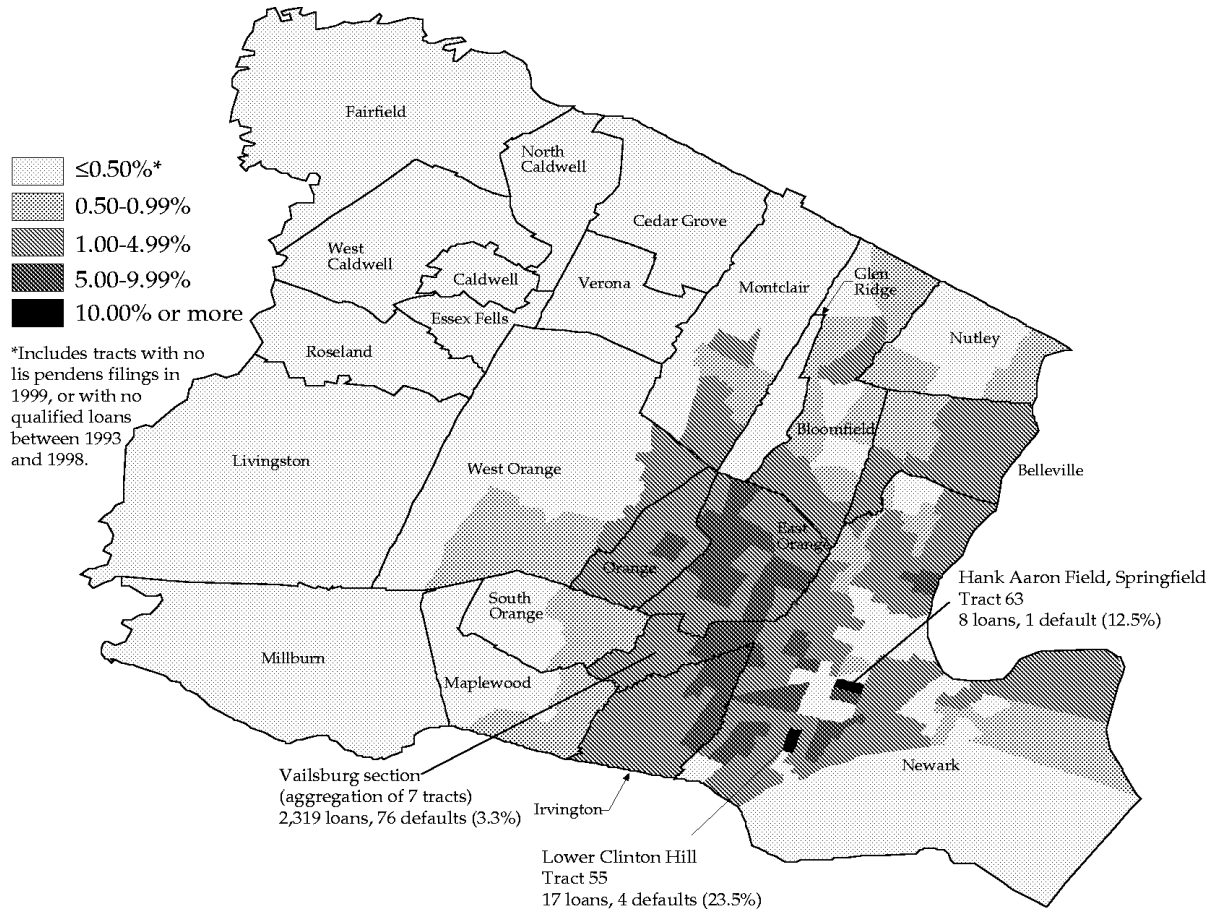
Figure 5. Tract odds ratios (significant at P<0.05) from logistic regression model of subprime mortgage selection, 1993-1999.
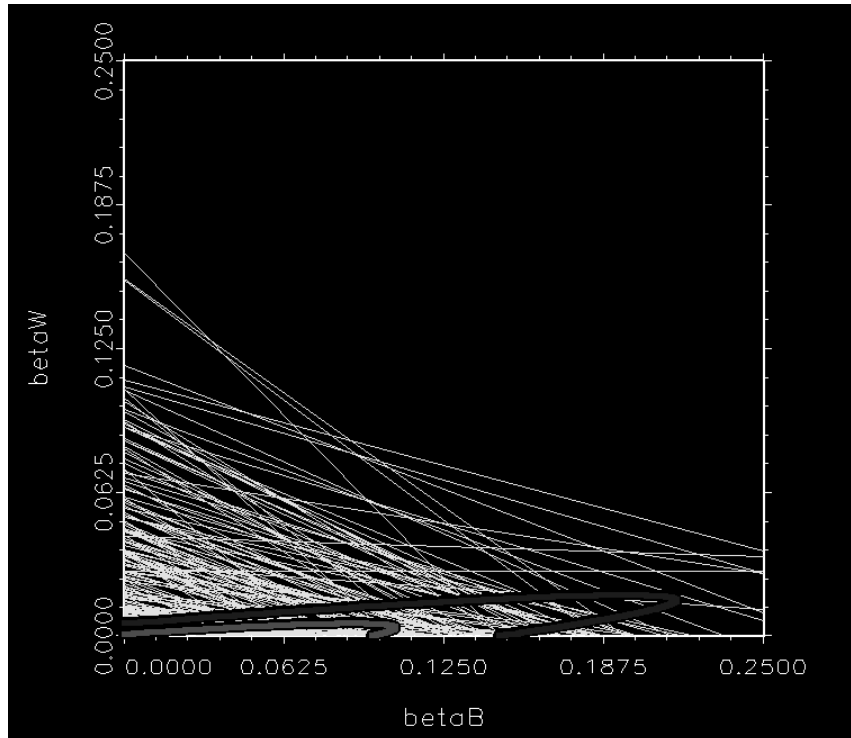
Source: FFIEC (1994-2000).

Figure 6. 1999 Pre-foreclosure rate of single-family loans originated 1993-1998, as a function of subprime share of loans originated 1993-1998, by census tract.

Source: American Foreclosures, Inc. (1999); FFIEC (1994-1999); Scheessele (1999).
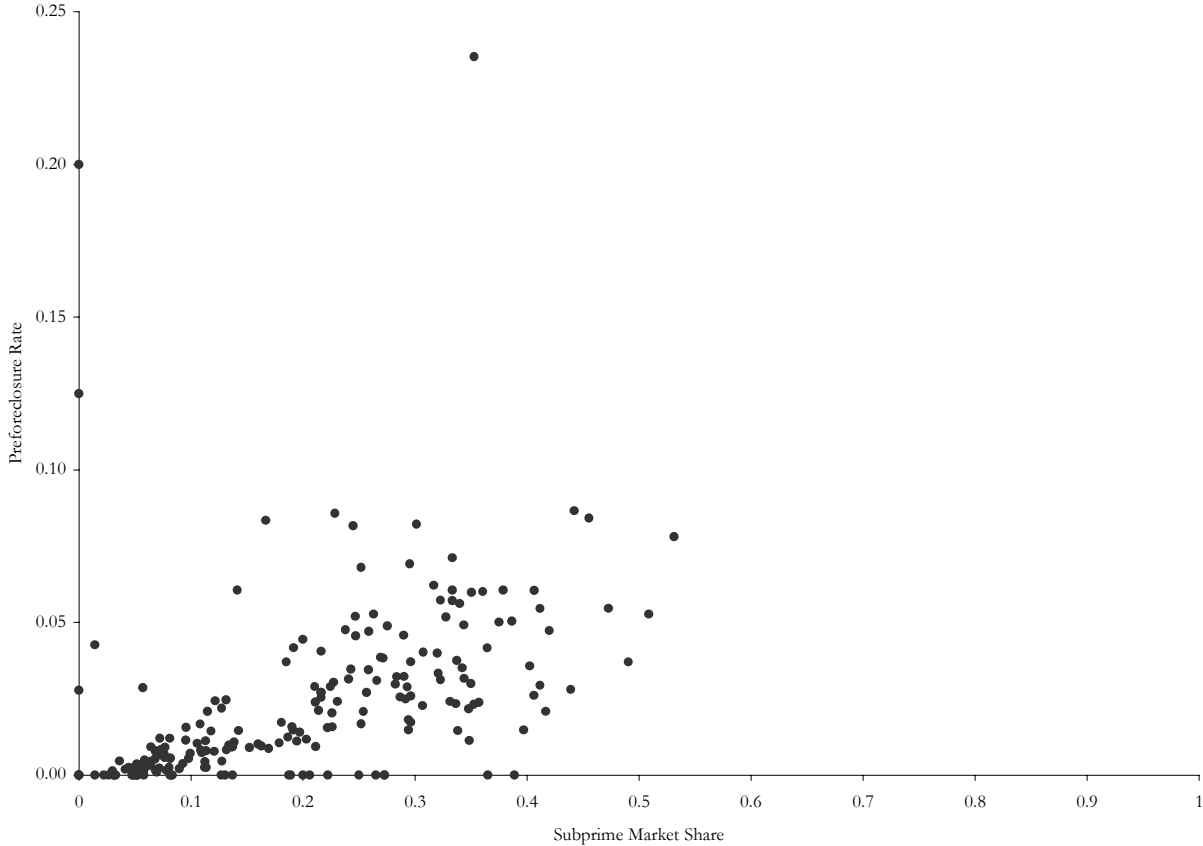
Figure 7. Tomography plot for Essex County preforeclosures.

Source: American Foreclosures, Inc. (1999); King (2000).

Figure 8. Estimated 1999 preforeclosure rates for prime and subprime loans. Top panel presents the lower end of the 95 percent confidence interval for the estimated preforeclosure rates for subprime loans originated between 1993 and 1998. Bottom panel presents the difference between a) the upper limit of the 95 percent confidence interval for the prime preforeclosure rate, and b) the lower limit of the 95 percent confidence interval for the subprime rate.
Source: American Foreclosures, Inc. (1999); FFIEC (1994-1999); Scheessele (1999).