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Race, Space, and Cumulative Disadvantage: A Case Study of the Subprime Lending Collapse

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Abstract

In this article, we describe how residential segregation and individual racial disparities generate racialized patterns of subprime lending and lead to financial loss among black borrowers in segregated cities. We conceptualize race as a cumulative disadvantage because of its direct and indirect effects on socioeconomic status at the individual and neighborhood levels, with consequences that reverberate across a borrower's life and between generations. Using Baltimore, Maryland as a case study setting, we combine data from reports filed under the Home Mortgage Disclosure Act with additional loan-level data from mortgage-backed securities. We find that race and neighborhood racial segregation are critical factors explaining black disadvantage across successive stages in the process of lending and foreclosure, controlling for differences in borrower credit scores, income, occupancy status, and loan-to-value ratios. We analyze the cumulative cost of predatory lending to black borrowers in terms of reduced disposable income and lost wealth. We find the cost to be substantial. Black borrowers paid an estimated additional 5 to 11 percent in monthly payments and those that completed foreclosure in the sample lost an excess of $2 million in home equity. These costs were magnified in mostly black neighborhoods and in turn heavily concentrated in communities of color. By elucidating the mechanisms that link black segregation to discrimination we demonstrate how processes of cumulative disadvantage continue to undermine black socioeconomic status in the United States today.

Keywords

stratification; discrimination; residential segregation; African Americans; wealth

Several recent studies have argued that the U.S. housing bust and foreclosure crisis was a racialized process in which residential segregation and private mortgage securitization structured risky subprime lending (Been, Ellen, and Madar 2009; Fisher 2009; Hyra, Squires, Renner, and Kirk 2013; Rugh and Massey 2010; Wyly et al. 2006, 2012). Although many posit a strong association between racial segregation and racially disparate subprime lending and foreclosure, we know surprisingly little about the mechanisms by which lending practices led to race-, class- and place-based inequalities. In this article we describe how residential segregation and individual and neighborhood racial disparities interconnect to generate cumulative disadvantage among African Americans in segregated cities. In doing so, we respond to Hedstrom and Swedberg's (2004:1) call for “the advancement of social

theory…that systematically seeks to explicate the social mechanisms that generate and explain observed associations between events."

Our elucidation of the mechanisms that link black segregation to racialized disinvestment enables us to quantify the financial losses sustained by African Americans as a result of discriminatory mortgage lending, and to demonstrate how processes of cumulative disadvantage operate to undermine black socioeconomic status in the United States today. Our research is guided by three goals. First we seek to explicate theoretically the structural conditions that enable highly racialized patterns of subprime lending and foreclosure in U.S. housing markets. Second, we seek to determine whether racial differences in background characteristics (credit scores, income, occupancy status, loan-to-value ratios, and loan purpose) and differential levels of exposure to exogenous factors (unemployment shocks, home price changes, and local foreclosure rates) might account for observed racial disparities in lending outcomes. Finally we seek to assess the degree to which racial disparities in subprime lending increase cumulative financial costs to black borrowers and black neighborhoods over time.

Our analysis contributes to the existing literature in several ways. First, we develop a theoretical model that links segregation, cumulative disadvantage, and racial stratification and apply it to the case of subprime lending and foreclosure (Anacker and Carr 2011; Bocian et al. 2011; Lichtenstein and Weber 2014). Second, we take into account omitted variables and multiple stages in the lending and foreclosure process not considered by prior work (e.g., Barr, Dokko, and Keys 2011, Faber 2013, Rugh and Massey 2010; Sen 2012; Williams, Nesiba, and McConnell 2005). Third, we quantify the serial displacement of capital experienced by African Americans in urban areas to move beyond simple ecological associations between residential segregation and socioeconomic disadvantage and demonstrate exactly *how* institutionalized discrimination widens economic disparities between individuals and neighborhoods on the basis of race (Kochhar, Fry, and Taylor 2011; Lipsitz and Oliver 2010; Molina 2012; Shapiro, Meschede, and Osoro 2013; Wolff 2012). Finally, we link previously discrete steps in the causal cycle of racial disinvestment by connecting the racial segmentation of mortgage capital in space (Ashton 2008; Crossney 2012; Fisher 2009; Hernández 2009; Wyly et al. 2006, 2012) to individual disparities in high risk/high cost lending (Ashton 2008; Barr, Dokko, and Keys 2011; Bocian, Reid, Li, and Quercia 2011) and then link both to neighborhood disparities in predatory lending (Apgar and Calder 2005; Bunce et al. 2002; Been, Ellen, and Madar 2009; Crossney 2012; Ding et al. 2008; Gilderbloom et al. 2012).

Drawing on a unique quantitative dataset originally developed to provide evidence for a landmark legal case, we estimate discrimination as the residual that remains between blacks and whites after controlling for all information used by mortgage brokers and bank officers to establish the terms of lending. We recognize, of course, that in the absence of sworn testimony or audit-based evidence (see Massey and Blank 2006), we cannot conclusively attribute discriminatory motives to the institutions and individuals involved, however much their behavior may seem to imply discriminatory intent. We nonetheless follow others in viewing the residual as an upper bound estimate of the extent of racial discrimination (e.g., Fix and Struyk 1993; Ladd 1998; Munnell et a. 1996; Reskin 2012; Ross and Yinger 2002;

Yinger 1998). In the end, we offer a comprehensive assessment of how cumulative disadvantage is generated spatially (DiPrete and Eirich 2006), how discriminatory systems emerge and are sustained (Reskin 2012), and how racial stratification is ecologically generated and reproduced over time (Massey 2007; Sharkey 2013).

RACE, SPACE, AND THE REPRODUCTION OF INEQUALITY

The historical link between institutional discrimination and racial residential segregation is well documented (Hirsch 1983; Massey and Denton 1993; Sugrue 1996) and has recently been extended to explain the disparate impact of the subprime mortgage crisis on blacks and whites (Rugh and Massey 2010). A growing body of scholarship indicates that the racialization of subprime lending and the ensuing concentration of foreclosures in historically disadvantaged neighborhoods was carried out primarily by private actors (Howell 2006; Hyra et al. 2013; Squires 2003; Stuart 2003) and enabled by the widespread securitization of risky mortgages by some of the world's most powerful financial institutions (Ashton 2008; Dymski 2009; Engel and McCoy 2011; Fligstein and Goldstein 2011; Hernández 2009; Immergluck 2009; Wilmarth 2009; Wyly and colleagues 2006, 2012).

The institutional innovations and financial deregulation that culminated in the subprime lending boom may have been as predatory as the lending practices and exotic loan products they enabled (Peterson 2007; Engel and McCoy 2007, 2011). As Squires (2003) first noted, the novel lending environment created by securitized mortgages made possible a new process of reverse redlining. Financial institutions that historically had redlined communities of color to deny them capital suddenly targeted them for subprime lending, literally capitalizing on segregation to perpetuate and profit from a dual housing market stratified by race (Aalbers 2011; Hernández 2009; Newman and Wyly 2004; Lipsitz and Oliver 2010; Rugh and Massey 2010; Shapiro 2006; Stuart 2003; Williams, Nesiba, and McConnell 2005; Wyly et al. 2006). The evidence strongly suggests that longstanding geographic disadvantages by race were exploited by private financiers who traded upon their class advantages in political and economic spheres (Krippner 2011; McCarty, Poole, and Rosenthal 2013; Wyly, Atia, and Hammel 2004; Wyly et al. 2012).

According to some observers, subprime lending in racially segregated neighborhoods directly fueled the proliferation of predatory lending practices (e.g., Engel and McCoy 2008, 2011; Fisher 2009; Williams, Nesiba, and McConnell 2005). Predatory practices involve lending based on assets (e.g., home equity) rather than the ability to repay, typically using deceptive terms and tactics that lead to further abuses or fraud and ultimately place borrowers into products that they are ill-equipped to repay, thereby increasing the profits of lenders and financial intermediaries at the expense of homeowners and investors (Delgadillo, Erickson, and Percy 2008; Engel and McCoy 2008; Goldstein 1999; Renuart 2004).

While not all subprime loans are predatory, virtually all predatory loans are subprime (Engel and McCoy 2011; Fishbein and Bunce 2001). Predatory lenders target borrowers with established home equity who have historically been underserved on the basis of age, gender, race, and neighborhood composition (Fisher 2009; Goldstein 1999; Howell 2006; Renuart 2004). Because subprime loans are more likely to yield adverse outcomes than standard

loans (Anacker and Carr 2011; Gilderbloom et al. 2011), during the subprime lending boom the principal mechanism of discrimination was not a denial of credit to minorities but the systematic seeking out of minority borrowers for loan packages that carried excessive costs and risks (Lipsitz and Oliver 2010; Oliver 2008).

Recent research on stratification has sought to understand how interlocking systems of discrimination and segregation influence individual- and neighborhood-level outcomes (Anderson 2010; Sampson 2012). As Reskin (2012) has argued, discrimination in lending is fundamentally related to inequities in other domains of social and economic life which are, in turn, structurally embedded within a broader system of race-linked disparities. According to Saegert et al. (2011), mortgage foreclosures entail a *serial displacement of capital* marked by the repeated extraction of financial, social, and human capital from poor minority communities defined at different geographic and social scales, such that losses suffered at one level in turn perpetuate losses at other levels.

The concept of *cumulative disadvantage* has likewise been developed to illustrate the mechanisms by which race can have both direct and indirect effects on individuals and families that accumulate over time, across generations, and between structural levels in society (Blau and Duncan 1967; Desmond 2012; DiPrete and Eirich 2006; Sharkey 2008; Wilson 1987). Anderson (2010) and Reskin (2012), in particular, provide strong philosophical reasons and empirical evidence to argue that discrimination within already racialized systems, such as housing and mortgage markets, exacerbates disparities in other systems, such as education and labor markets, to enable other forms of discrimination and inequality.

DiPrete and Eirich (2006) identify two distinct strains of theorizing about cumulative disadvantage: a strict cumulative theory informed by the work of Merton (1988) and a structural theory outlined by Blau and Duncan (1967). Here we follow the latter perspective, which attributes intergroup inequality to differences in returns to socioeconomic resources. Our study conceptualizes race as a cumulative disadvantage because of its direct and indirect effects on socioeconomic status, with consequences that reverberate across a borrower's life and between generations. Our study offers an empirical investigation of the financial costs of the cumulative exposure model of disadvantage articulated by DiPrete and Eirich (2006).

Continuous exposure to racial discrimination accross different venues can be expected to have direct, ongoing effects on the accumulation of wealth among individuals, families, and communities (Conley 1999; Killewald 2013; Oliver and Shapiro 1995). Our study attempts to identify and quantify the specific mechanisms by which discrimination in mortgage lending accumulates over the lives of individuals and neighborhoods (Blank, Dabady, and Citro 2004; Sharkey 2008), thus exposing African Americans to cumulative socioeconomic disadvantage irrespective of their personal and family characteristics (Sampson 2012; Sharkey 2013). Controlling for indicators of credit worthiness not found in prior work on race and subprime lending (Faber 2013; Williams, Nesiba, and McConnell 2005; Rugh and Massey 2010) we seek to quantify the cost of racially disparate treatment in mortgage markets. Figure 1 illustrates our conceptual model of the mechanisms that generate cumulative disadvantage through mortgage lending.

On the left-hand side of the diagram, the model includes all factors observed by lending officers on the loan applications themselves (listed in the boxes labeled “Borrower and Loan Features” and “Property Characteristics”). In the context of ongoing residential segregation and the shift toward private securitization (depicted to the left as exogenous conditions), black departures from predictions based on data from the application form (statistically significant unexplained residuals) constitute reasonable evidence of discrimination. We hypothesize that black borrowers and black neighborhoods are disproportionately channeled into subprime loans characterized by excessive costs and risks, which in turn raise the odds of default and foreclosure and ultimately increase the likelihood of repossession. Since higher loan costs reduce disposable income and riskier loan products threaten home equity, together they bring about the serial displacement of capital hypothesized by Saegert et al. (2011). Reduced income and lost wealth, in turn, carry forward through the life cycle and are transferred to future generations to create cumulative disadvantage as hypothesized by Blau and Duncan (1967).

Recent research on communities of color documents the serial displacement of capital through subprime lending. Using in-depth interviews, Botein (2013) demonstrates that the initial reliance of black borrowers on risky loans stems directly from the historical denial of credit to residents of segregated neighborhoods. Risky lending subsequently leads to the loss of wealth through foreclosure as well as subtle, repeated losses of income through sacrifices made by homeowners who do not default but are burdened by high cost loans. Thomas (2013) interviewed several dozen black and Latino households undergoing foreclosure in Boston and documented a pattern of “asset depletion” that ultimately led to “asset exhaustion,” wherein savings and other assets were used up in vain attempts to preserve home ownership. Like Botein (2013), Thomas (2013) found that while some households did manage to keep their homes, they nevertheless suffered from serial extractions of income that ultimately deprived them of resources for future mobility.

The racialized nature of this process of serial displacement was racialized is indicated by research documenting significant racial disparities that remain unexplained once factors germane to the lending process are taken into account. In his multinomial model of loan denial and high cost subprime loan receipt, for example, Faber (2013) reports that rates of subprime lending *decline* as incomes increase among white borrowers but *increase* with income among borrowers of color, net of other factors (see also Immergluck and Wiles 1999; Bocian et al. 2011). As a result of these unexplained racial differences in lending, racial disparities in foreclosure are greater among high income minority than poor minority borrowers (Anacker and Carr 2011; Anacker, Carr, and Pradhan 2012).

In our analysis, we estimate the excess costs and risks of mortgage discrimination for black borrowers with incomes over $50,000 as well as for blacks in general, a class boundary chosen by Lacy (2007, 2012) for theoretical reasons and supported by the empirical work of Faber (2013). We hypothesize that cumulative disadvantages in lending and foreclosure are worse for those earning higher incomes, consistent with the observation that high status blacks come into greater contact with whites and thus experience greater exposure to racial discrimination (Cose 1993; Collins 1997; Feagin and Sikes 1994; Hochschild 1995).

The proliferation of subprime and predatory lending in black communities depends on a specific historical configuration in which racial categories are linked to the ability to own property, accumulate assets, and transfer wealth through home ownership (Harris 1993). Beeman, Glasberg, and Casey (2011) identify "whiteness as property," such that light skin color is ascribed a value that confers both psychological benefits and concrete advantages in the accumulation of wealth through home ownership. The link between race, property, and subprime lending is consolidated by socially constructed, racialized space in cities (Anderson 2010; Coates 2014; Knowles 2003; Massey and Denton 1993; Neely and Samura 2011; Sampson 2012). As such, geographic space is interpreted by private and public actors to inscribe whiteness in terms of suburbanized residence and widespread homeownership and blackness in terms of city residence with low ownership (Gotham 2014; Powell 2005; Sugrue 1996).

Once a neighborhood is racialized as black space, the stigma tends to persist even if whites later come to exceed blacks numerically (Deener 2010, 2012). According to Knowles(2003:80), urban residential space represents an "active archive" of past social processes that shape contemporary conceptions in ways that undergird targeted subprime lending and reverse redlining (Hernández 2009; Satter 2009; Squires 2003; Stuart 2003; Williams, Nesiba, and McConnell 2005). As conceived by Anderson (2010), spatial segregation by race begets racial inequality, racial stereotypes, and stigmatized racial space, which in turn reinforce racial segregation and widen racial inequality. Our analysis attempts to show empirically how racial disparities are linked, amplified, and transferred through spatial mechanisms to other subsystems in ways that reinforce the cumulative disadvantage of African Americans in segregated cities.

DATA AND METHODS

While compelling, ecological correlations between neighborhood racial composition and racial disparities in mortgage lending and foreclosure must be subject to more rigorous empirical analysis to eliminate rival explanations and to demonstrate *how* racial segregation operates to generate disparate outcomes. To accomplish these goals we focus on a single lender in a single city to perform a quantitative case study (see Brady and Collier 2004; King, Keohane, and Verba 1994; Small 2011). Disparate outcomes in lending by race and neighborhood racial composition may stem either from structural or individual discrimination (Sen 2012). Structurally, borrowers of different races may be channeled toward different lenders by institutional practices and racial disparities may result from this channeling as well as discriminatory treatment. Individually, African Americans may also exhibit objective characteristics that draw them to certain institutions for subprime lending and increase the risk of default, apart from any possible racially discriminatory practices.

By focusing on a single lender in a single urban location (Wells Fargo in Baltimore) we minimize the influence of such confounding selective processes. Baltimore is a classic hypersegregated metropolitan area (Logan and Stults 2011; Massey and Denton 1989; Wilkes and Iceland 2004) and in many ways is emblematic of the national foreclosure crisis (Bunce, Gruenstein, Herbert, and Scheessele 2002; U.S. Department of Housing and Urban Development. 2000). As in other large, segregated urban areas—from Chicago to Los

Angeles, Minneapolis to Philadelphia, and Atlanta to New York— geographic disparities in subprime lending and foreclosure in Baltimore are more closely linked to individual race and neighborhood racial composition than to neighborhood income or borrower characteristics (Been, Ellen, and Madar 2009; Calem, Hershaff, and Wachter 2004; Crossney 2012; Ding et al. 2008; Fishbein and Bunce 2001; Hernández 2009; Hyra, Squires, Renner, and Kirk 2013; Institute on Race and Poverty 2009; Rugh and Massey 2010; Stuart 2003; U.S. Department of Housing and Urban Development 2000; Wyly et al. 2006).

When foreclosures are plotted geographically on a map, their disproportionate concentration in black neighborhoods becomes clear (City of Baltimore v. Wells Fargo et al. 2010). Compared to borrowers in predominantly white neighborhoods, those in predominantly black areas were 2.9 times more likely to lose their home in a completed foreclosure from 2000 to 2009. Although the data pertain only to a single financial institution, Wells Fargo Bank is the nation's largest home lender and issued a large share of all prime and subprime loans during the housing boom, not only in Baltimore but throughout the nation. In connection with a landmark legal settlement with the Department of Justice and city governments in eight other urban regions (Chicago, Cleveland, Los Angeles, New York, Philadelphia, the San Francisco Bay Area and Washington), in 2012 Wells Fargo agreed to pay $175 million to settle allegations of discriminatory predatory lending.

Baltimore is a good test case because theoretically it should its neighborhoods should have been protected by the provisions of the Community Reinvestment Act (CRA). From 2004 to 2006, we estimate that around 64% of all mortgage loans in the Baltimore MSA were originated by institutions covered under CRA (using the methods of Friedman and Squires 2005 and Rugh and Massey 2010). This level of CRA coverage ranked Baltimore 55th among the 100 largest metropolitan areas. Because research has demonstrated the beneficial effects of levels of CRA coverage in terms of access to credit (Casey et al. 2011) and neighborhood integration (Friedman and Squires 2005), levels of unregulated and potentially discriminatory subprime lending may be worse in many other urban areas, given that the degree of CRA coverage in Baltimore lies at the middle of the distribution among major metro areas during the housing boom. Whatever is the case elsewhere, the relatively high level of CRA coverage in Baltimore appears to have provided little protection to black borrowers from predatory lending.

During the housing boom in Baltimore and elsewhere loan officers relied on “rate sheets” to assign borrowers to specific mortgage products based on a matrix of objective characteristics, primarily the borrower's credit score, loan-to-value range, occupancy status, and documentation level (Brooks and Simon 2007). Prior research and sworn testimony suggest that, owing to a combination of racial stereotypes and perverse economic incentives, officers from mainstream lenders and not just independent mortgage brokers frequently deviated from these rate sheets on the basis of both race (steering them into subprime products when they qualified for conventional loans) and neighborhood racial composition (targeting black neighborhoods for the marketing of subprime loans using practices of reverse redlining—see Cavell 2012; City of Baltimore v. Wells Fargo et al., 2010; City of Memphis and Shelby County v. Wells Fargo et al., 2010; Fisher 2009; Hudson 2010; Morgenson and Rosner 2011; Stuart 2003).

To investigate claims of discriminatory steering and reverse redlining and their consequences, we combine data from two primary sources. First, under the Home Mortgage Disclosure Act (HMDA) we obtained borrower-, loan-, and tract-level information on mortgages originated in Baltimore, and second, from publicly available sources we assembled loan-level records covering two types of mortgage-backed securities—private label mortgage-backed securities (MBS) and loans securitized by the government-sponsored enterprise (GSE) Freddie Mac. Drawing on the work of Rugh (2012), who compiled a national database of over 10 million MBS and GSE loans, we extracted 3,027 matched records for loans made by Wells Fargo in Baltimore during 2000-2008. The final file contains detailed data on characteristics of the borrower, the loan, and the property, as well as time-varying information on housing and labor market characteristics defined at the tract, zip code, and city levels.

We focus on black-white disparities in mortgage lending and exclude borrowers of other races and ethnicities as well as those missing racial identifiers, limiting our final data set to 2,526 loans made to non-Hispanic blacks and non-Hispanic whites in Baltimore during 2000-2008. We follow the delinquency history of all loans in the data set through June 2010 and completed foreclosures through December 2012. We isolate structural and individual effects by estimating models of mortgage lending for black and white borrowers and black and white neighborhoods and use them to generate predicted disparities in loan characteristics that are then applied to account for later disparities in foreclosure and home repossession, controlling for rival explanations. Our framework thus connects outcomes across successive steps in the mortgage process to capture the interlinked processes that yield cumulative disadvantage for black borrowers and black neighborhoods.

Table 1 lists summary statistics for variables we employ in our analysis, presented separately for blacks and whites. The variables include all data from the loan application form, additional information on the loan itself, supplementary data on socioeconomic status, racial composition, and housing in the borrower's tract or zip code of residence, plus an indicator of employment conditions in Baltimore as a whole. Following convention and prior research (Been, Ellen, and Madar 2009; Faber 2013; Hyra et al. 2013; Rugh and Massey 2010), we use the HMDA data to define a high cost subprime loan as one in which the interest rate exceeds the comparable U.S. Treasury rate by three percentage points or more (five or more points for second lien loans).[1] Under this definition, the dramatic disparity in subprime lending by race is immediately obvious. Whereas 64% of black borrowers received such a loan the figure was just 18% for whites, meaning that black borrowers were 3.5 times more likely than white borrowers to experience subprime lending.

Black borrowers were also more likely to end up with what is known as a combined risk loan—one characterized by multiple risk factors that together statistically predict high default rates. Following the work done in the case of Adkins v. Morgan Stanley (2012), we define a combined risk loan as a high cost loan that has at least two of the following additional risk features: an adjustable rate, interest only amortization, low or no

[1]In a matched sample, Rugh (2012) reports that 91% of subprime loans independently labeled by secondary market institutions were also high cost HMDA rate spread loans.

documentation, a combined loan-to-value ratio over 90%, balloon payment provisions, a prepayment penalty, or a back-end debt-to-income ratio greater than 55%. Whereas 45% of black borrowers received such a loan, the figure was only 13% for white borrowers, a differential of more than three to one.

Although low or no documentation lending may appear to be a potential boon to disadvantaged borrowers, given that they receive a larger loan per unit of income than other borrowers, several accounts indicate that low/no documentation loans during the housing boom were given to borrowers who were, in fact, willing and able to offer full documentation of their income and assets but who were nonetheless steered into higher cost, higher interest loans (Andrews 2009; Engel and McCoy 2011; Lewis 2010; Morgenson and Rosner 2011). Beyond any single risk category, prior research has found that the *layering of risk* is what leads to higher rates of foreclosure, even after controlling for other factors that also predict the likelihood of default (Ding et al. 2011; Goldberg and Rice 2013; Zandi 2009)

In addition to the foregoing racial disparities, compared with whites blacks also exhibit higher rates of investor occupancy, more frequent single mortgage borrowing, greater loan-to-value ratios, higher rates of cash-out refinance lending, more frequent exposure to prepayment penalties, and more adjustable interest rate loans. They are also much more likely to experience these risk factors simultaneously. Partially as a result of this layering of risk factors, black borrowers are much more likely to receive a *Lis Pendens* filing and enter foreclosure, with 18% going into foreclosure compared with just 6% of white borrowers. In addition, some 11% of black borrowers had completed foreclosure and lost their homes to repossession, a fate shared by only 4% of white borrowers.

Racial disparities in lending, default, foreclosure, and repossession are thus readily apparent in our data. Yet the remaining sample statistics reveal other important differences between black and white borrowers that might plausibly account for racial disparities in lending terms and foreclosure rates. For example, blacks evince a greater likelihood of borrowing at the housing bubble's peak in 2006 as well as lower incomes, credit scores, and rates of neighborhood educational attainment, all factors that prior studies have shown to undermine loan performance and raise the odds of default and foreclosure (e.g., Anacker and Carr 2011; Chan et al. 2013; Ding et al. 2011; Gilderbloom et al. 2012; Pennington-Cross and Ho 2010).

Despite the foregoing disparities, two indicators of mortgage risk either do not differ by race (the prevalence of low or no documentation loans) or are actually higher among white borrowers (interest only amortization). Particularly instructive, however, is the black-white difference in refinance lending and cash-out refinance lending. As the majority population and longtime residents of a Baltimore's historically underserved market, black borrowers were more likely to use loans to refinance existing mortgages than to purchase new homes, and to use the refinance to extract cash for other purposes (Botein 2013). The converse was true for white borrowers, thus underscoring the potential for predatory wealth extraction from borrowers with an already established equity position in their homes (Goldstein 1999; Howell 2006; Renuart 2004).

At the neighborhood level, census tract data reveal that black and white mortgage holders occupy very different spaces within Baltimore's racially segmented landscape. Indeed, the symmetry of isolation by race in our sample of borrowers is striking. Whereas 79% of whites lived in tracts that were less than 50% black, 81% of blacks lived in tracts that were at least 50% black. Although 21% of white borrowers appeared to live in black neighborhoods, close inspection of these cases revealed many to be investors who likely lived elsewhere (see Gilderbloom et al. 2012). While rising gentrification partly fueled by the subprime mortgage boom may have integrated black and white households in resurgent cities such as Washington, DC, black-white segregation may have been exacerbated in cities such as Baltimore (Bond and Williams 2007; Fischer 2013; Friedman et al. 2012; Friedman, Tsao, and Chen 2013; Hyra and Rugh forthcoming; Lichtenstein and Weber 2014).

The statistics in Table 1 also confirm the well-documented disparity in home appreciation rates by race and neighborhood racial composition (Flippen 2004). From 2000 to the neighborhood-specific peak in 2006-2007, local home prices rose by 139% for black borrowers compared with 168% for white borrowers. Although prices rose higher among whites they dropped by only 35% compared with 40% among blacks. Thus the explosion and collapse of home values in Baltimore further cemented the nexus between geography, race, and real estate value, thereby putting black wealth even further behind that of whites (Conley 1999; Oliver and Shapiro 1995; Schafran and Wegmann 2012).

DOCUMENTING RACIAL DISPARITIES IN LENDING

In order to assess the degree to which discrimination may have played a role in determining racially disparate outcomes with respect to foreclosure and repossession, we begin by focusing on two critical loan features: cost and risk. We assess differential lending cost by predicting the probability of receiving a subprime loan by race of borrower and the tract percentage black percentage while controlling for other relevant borrower, loan, and contextual characteristics. To assess differential exposure to risk we express the probability of receiving a combined risk loan on the same set of variables. These regressions allow us to estimate the controlled effects of individual race and neighborhood racial composition on the odds of experiencing two prominent features of predatory lending: high cost and excessive risk.

As discussed earlier, to the extent that the race of individual borrowers and their neighbors has significant effects net of controls we consider this residual effect a reliable estimate of the maximum magnitude of individual racial discrimination against African Americans and reverse redlining directed at black neighborhoods. The main results by race and neighborhood racial composition that we report here are adjusted predictive margins (average marginal effects) generated using Stata software version 12.1 (StataCorp 2011).[2] In Figure 2 we graph the predictive margins in high cost subprime lending for black versus

[2]Post-estimation predictive margins are particularly well-suited for the nature of our investigation for three important reasons. First, predictive margins or adjusted predictions are estimates of the underlying outcomes in tangible units of measurement. In our case, predictive margins yield probabilities (i.e., of high cost and combined high risk lending) which lead to more intuitive interpretations than odds ratios. Second, the margins estimation procedure may be specified to generate adjusted margins based on the actual values of the data rather than constraining the remaining covariates to sample means which may not be of interest or appropriate given the underlying data (Williams 2012). The third reason predictive margins are a suitable method is that they may be generated along a

white borrowers along the continuum of neighborhood racial composition, plotting the adjusted predicted probability of receiving a high cost loan by race (and the 95% confidence bands) after accounting for a comprehensive set of borrower, loan, and neighborhood characteristics reported in Appendix Table 1, column (1). We overlay dotted lines that correspond to the unadjusted incidence of high cost lending without controlling for any additional factors.

After accounting for critical controls such as loan-to-value, credit score, and borrower income there is no overlap in the predicted probability or margin of error for white and black borrowers in Figure 2. The separate estimates by race each exhibit a rising slope as the proportion of the neighborhood that is black increases. The overlaid actual means by quintile punctuate the elevated levels of high cost lending experienced by black borrowers—all well above predicted ranges aside from the few that live in predominantly white neighborhoods. By contrast, the actual levels of high cost lending among whites lie below, overlapped, and, for a few in mostly black areas, above the predicted range. Because blacks are concentrated in mostly black areas and whites in mostly white areas, the average adjusted prediction for high cost lending (margin) for whites overall is 30% and blacks, 46%.

Using the same specification as above in Figure 3 we estimate the probability of receiving a combined risk loan (Appendix Table 1, column (2)) and depict the adjusted predictions by race and neighborhood racial composition. Despite controlling for underwriting criteria there is no overlap between the adjusted predictive margins for black and white borrowers. Additionally, although the margins for whites overlap with unadjusted rates of combined risk lending, the margins for blacks once again strongly suggest the presence of discrimination in lending in terms of risk. Net of all controls, the average adjusted predicted probability of combined risk lending among whites overall is 22%, and blacks, 31%.

THE COST OF CUMULATIVE DISADVANTAGE

The results depicted in Figures 2 and 3 reveal that control variables attenuate but do not erase the racial and neighborhood disadvantages that appear at the first stage of the lending process, where loan cost and risk are determined. The systematic racial disparities among black borrowers and residents of black neighborhoods in high cost/high risk lending by itself can be expected to increase the likelihood of foreclosure and repossession, yielding an indirect pathway by which racial disparities and racial discrimination in lending may constrain the potential for home ownership and wealth accumulation. The foregoing section offered estimates that suggest possible significant discrimination against black individuals and black neighborhoods in mortgage lending within Baltimore and which together imply a layering of risk that may accumulate across different segments of the lending and foreclosure process through both direct and indirect mechanisms, as hypothesized in Figure 1.

continuum of representative values and a combination of multiple explanatory variables of interest (Williams 2012). For our purposes, this means that we may examine predictive margins or adjusted predictions not solely for blacks and whites, but simultaneously along the continuum of neighborhood racial composition (e.g., blacks in black neighborhoods and blacks in white neighborhoods). We report the robust standard errors in the appendices without clustering at the local level. In separate specifications, we clustered the standard errors at the zip code and census tract levels and our pattern of results and levels of significance on the main variables of interest remained unchanged.

Although Figure 1 describes the mechanisms by which cumulative disadvantage operates via mortgage lending practices in segregated cities such as Baltimore, it does not measure the total value of the costs that black borrowers incur or the losses they sustain because of potential racial discrimination. Although black borrowers and black neighborhoods may have been targeted for high-cost subprime mortgages and high-risk lending products, we have yet to examine the degree to which this discrimination produced additional financial and risk burdens that lowered disposable income and ultimately increased the likelihood of foreclosure and repossession to result in the loss of specific amounts of home equity. We now turn to estimate the cumulative financial costs of the racialized processes we have documented to this point.

Excess Borrowing Costs

We begin by estimating an ordinary least squares regression model to predict monthly loan payment amounts using data on white borrowers with a model specification identical to that used to predict cost and risk, except that we exclude borrower gender and include loan balance to approximate as closely as possible the underwriting criteria seen by loan officers. For reference and transparency we show the estimated model in Appendix Table 1, column (7). We then generate predictive margins (adjusted predictions) for black borrowers by applying the estimated coefficients for white borrowers to the observed characteristics for black borrowers to predict monthly payment amounts. This procedure simulates outcomes for black borrowers had they received the same treatment as similarly situated whites. We subtract this predicted monthly loan payment from the observed loan payment to compute the extra amount paid by black borrowers because of cumulative disadvantage and potential racial discrimination.

The results of this exercise are shown in the top panel of Table 2, which displays in different rows the extra amount paid by different subsets of borrowers: all black borrowers, those earning over $50,000, and those with private label securitization. As discussed earlier, we choose to specify black borrowers with incomes over $50,000 for theoretical (Lacy 2007, 2012) and empirical reasons (Faber 2013) and expect that higher income will not diminish, and may even exacerbate, the cumulative disadvantage in subprime lending. After the column indicating the number of cases in each group, the first substantive column shows the extra amount paid per month as a percentage of the borrower's total payment. Subsequent columns express the extra amount in total dollars annually, dollars spent on the loan to date, and total dollars projected over a 30-year amortization period. For example, in the first row of the top panel the average black borrower in Baltimore paid about 5.3% extra per month in mortgage payments than predicted by the white model, which cumulates to $497 per year, $1,739 as of the time of foreclosure, and a potential total of $14,904 over the life of a 30-year mortgage.

As expected, higher socioeconomic status does not appear to afford black borrowers protection from the financial costs of serial displacement. On the contrary, among black borrowers earning over $50,000 per year the racial disparity amounted to 6% of the monthly payment rather than 5.3% for all black borrowers, for an additional cost of $634 per year, $2,220 since loan origination, and $19,026 over the life of the mortgage. The role played by

the private secondary market in funding subprime lending to African Americans is indicated by the very high costs associated with privately securitized loans (70% of all loans to black borrowers). The average cost for those holding privately secured loans was more than twice as large as for all black borrowers, 11.1% of the monthly payment compared with just 5.3%, yielding estimated excess costs of $1,067 per year, $3,733 to date, and $32,000 over the life of the loan.

In order to assess the potential cost of reverse redlining to borrowers in majority black neighborhoods, we generate predictive margins to estimate monthly loan payments, but this time we compare borrowers in majority black neighborhoods to those living in majority white neighborhoods. The second panel of Table 2 shows the estimated cost of cumulative disadvantage to borrowers living in predominantly black neighborhoods. On average, the cost of living in a black neighborhood was around 3% of the monthly mortgage payment, yielding a total cost of $255 per year, $894 since loan origination, and $7,664 over the life of the loan. As before, the cost of discrimination was greater for affluent borrowers, rising to 3.7% of the monthly payment for those earning at $50,000 per year, $10,768 over the life of the loan. Private securitization raises the cost to 7.5% of the monthly payment, $19,786 over the life of the loan.

The excess amounts paid by borrowers as a result of the two bases of discrimination—being black and living in a black neighborhood—are shown in the third panel of Table 2. Based on the characteristics of black borrowers living in black neighborhoods we generate the predicted (adjusted margin) monthly payment they would have made if they had been treated like white borrowers in white neighborhoods. We then subtracted this amount from the observed monthly payment to determine the combined cost of racial discrimination against black individuals and black neighborhoods.

The top line of the third panel shows that the total cost of individual- and neighborhood-based racial discrimination for the average borrower came to 6.4% of the monthly payment, or $532 per year, $1,861 since loan origination, and $15,948 over the life of the loan. These amounts estimate the costs of discrimination incurred by the 80% of all black borrowers in Baltimore who lived in majority black neighborhoods. As we have come to expect, the costs rise for affluent borrowers and those holding privately securitized mortgages, for whom the monthly penalties rose to 7.2% and 11.3%, respectively, yielding total costs of $651 and $954 per year, $2,277 and $3,339 since origination, and $19,516 and $28,616 over the course of full amortization.

The remaining two panels document similar adverse outcomes for blacks in white neighborhoods and whites in black neighborhoods. The difference in actual versus predicted monthly payments was especially pronounced (9.7% or $1,405 per month) for blacks with privately securitized mortgages living in white neighborhoods. This result documents how the channeling of blacks into the riskier and costlier loan products in demand by secondary markets imperiled the residential stability of African Americans even outside core black areas (Molina 2012; Schafran and Wegmann 2012). Whites in black neighborhoods also paid more than they would have had they been located in white neighborhoods. According to the logic of reverse redlining that targeted segregated neighborhoods, whites in black areas

also experience a risk disparity in lending, albeit smaller than that experienced by blacks (Holloway 1998; Williams, Nesiba, and McConnell 2005). Overall this location-based disparity for whites was small but rose to 6.4% or $679 per year for privately securitized loans, providing further evidence of targeted reverse redlining (Been, Ellen and Madar 2009; Fisher 2009).

Excess Borrowing Risks

In addition to being channeled into higher cost loans, borrowers in Baltimore were also channeled into riskier lending products if they were black and/or lived in predominantly black neighborhoods. As before, to determine the excess risks experienced by African Americans because of racial discrimination we estimate models to predict the likelihood of receiving a combined risk loan for white borrowers, for all borrowers in predominantly white neighborhoods, and for white borrowers in white neighborhoods (Appendix Table 1, column (3)). We then use these models to generate adjusted predictions (margins) based on the observed characteristics of African Americans to determine the likelihood they would have received a combined-risk loan if they had been white, living in a white neighborhood, and been white and living in a white neighborhood. We again augment these scenarios by also comparing African Americans in white neighborhoods to whites in the same white neighborhoods and whites in black neighborhoods to whites in white neighborhoods. The results of these five sample group comparisons are summarized in Table 3.

The top panel considers the excess risk experienced by African Americans generally. The first column to the right of the sample size shows the observed share of black borrowers in Baltimore receiving a combined risk loan; the next column shows the predicted share if they had been treated the same as whites; and the final column computes the excess risk experienced because of racial discrimination by subtracting the two values. As shown in the first line, 45% of black borrowers received a combined-risk loan whereas if they had been treated like white borrowers in the lending process the figure would only be 31.9%, yielding an excess of 13.2 points in risk exposure, or a risk disparity of 41%. In this case, the excess was slightly lower at 9.5 points for affluent blacks earning $50,000 or more; but as before the excess was greater for privately securitized loans (18.9 points or a risk disparity of 42%).

The second panel shows the excess risk experienced because of disparities experienced by residents of predominantly black neighborhoods. Based on predictions for those living in predominantly white neighborhoods only 31.0% of borrowers in black neighborhoods would have received a combined-risk loan rather than the observed 41.8%, yielding an excess exposure to risk of 10.8 points or roughly 35%. Once again the excess risk was lower for affluent borrowers but much higher for those with privately securitized loans (an excess of around 19.8 points or a risk disparity of 46%). The third panel shows that when borrowers were not only black but lived in black neighborhoods the excess exposure to a combined risk loan was quite marked at 13.5 points or 41%. For those with privately securitized mortgages the disparity was 18.9 points or 41%. The final two panels of Table 3 document that the risk differential for blacks in white tracts is somewhat reduced. For whites in black tracts, the risk gap is reduced further except for privately securitized loans, underscoring the how securitization may have helped fuel reverse redlining.

Excess Foreclosures

The foregoing analyses strongly suggest that racial discrimination against individual African Americans and black neighborhoods in Baltimore's home lending market imposed excess costs and risks on black borrowers, especially when mortgages were privately securitized, and that higher class status did not protect African Americans from excess costs. With systematically higher mortgage payments and riskier lending packages, we expect African Americans and those in black neighborhoods to display a greater likelihood of default and foreclosure. Following our previous approach, to assess the excess likelihood of foreclosure owing to racial discrimination we estimated three logistic regression models to predict the probability of entering foreclosure: (1) for white borrowers, (2) for all borrowers living in white neighborhoods, and (3) for white borrowers living in white neighborhoods. The equations were the same as those used earlier except that they included the amount of the predicted monthly mortgage payment and the predicted probability of combined-risk loan receipt. We then used the estimated coefficients to generate average adjusted “out-of-sample” predictive margins (StataCorp 2011) based on the observed characteristics for black borrowers (vs. in-sample of white borrowers), borrowers in black neighborhoods (vs. white neighborhoods), black borrowers in black neighborhoods, black borrowers in white neighborhoods, and white borrowers in black neighborhoods (all vs. whites in white neighborhoods). These out-of-sample predictive margins measure the predicted probabilities of foreclosure in the absence of discrimination and neighborhood disadvantage.

As Reskin (2012) has argued, discrimination and racial differences are interconnected across different domains, such as the stages of lending and foreclosure. Rather than applying the coefficients to observed mortgage payments and the actual kind of mortgage held, therefore, we substituted in the adjusted predicted (predictive margins) mortgage payment and the expected probability of holding a combined-risk mortgage estimate from white models on earlier steps (Appendix Table 1), giving each borrower the value on these predetermined variables they would have achieved in the absence of discrimination. The resulting estimation results and out-of-sample margins for sub-groups by race and tract composition are shown in Appendix Table 2.

The three left-hand columns of Table 4 show the final predicted probabilities or predictive margins of foreclosure and compare them with observed probabilities for black borrowers (top panel), borrowers in black neighborhoods (second panel), black borrowers in black neighborhoods (third panel), black borrowers in white neighborhoods (fourth panel), and white borrowers in black neighborhoods (final panel), and subtracts them to compute the excess likelihood of foreclosure owing to hypothesized racial discrimination and cumulative disadvantage. As can be seen, black homeowners in Baltimore would be expected to have a 10.4% likelihood of entering foreclosure if they had been treated the same as whites instead of the observed 17.9%, a gap of 7.5 points, which translates into 90 excess foreclosure filings.

As hypothesized, the predicted likelihood of foreclosure was lower for affluent black homeowners at just 7.7% whereas the observed likelihood was much *higher* at 19.4%, yielding a large gap of 11.6 points (77 excess filings). The gap is also quite large at 9.2 points for privately securitized loans (13.8% predicted versus an observed likelihood of

23.0% or 75 extra filings). As before, higher socioeconomic status carries little or no protective effect against foreclosure within the black community (Anacker and Carr 2011; Lacy 2012), and once again private mortgage securitization accentuates the risk (Bocian et al. 2011). The top panel reveals that the average black borrower who entered foreclosure had accumulated nearly $42,000 in equity at the time of filing, putting a total of some $3.7 million in home equity at risk of potential loss through foreclosure.

The second panel shows the estimated gap in the likelihood of foreclosure between borrowers living in predominantly white versus predominantly black tracts. Although the gaps are smaller than when comparing white and black borrowers, the overall pattern is the same, with higher rates of foreclosure among affluent borrowers and privately securitized loans than among residents of black neighborhoods generally. Among borrowers living in majority black tracts, the potential loss was $2.5 million. Combining black race with residence in black neighborhoods in the third panel reveals the cumulative effect of racial disparities on the likelihood of foreclosure. Black residents living in predominantly black tracts would evince a foreclosure rate of 9.3% if they were treated like white residents of white tracts with the same characteristics, but the observed likelihood of foreclosure is 17.2%, a gap of 7.9 points and 76 excess foreclosure filings. The gap rises to 11 points (55 extra filings) among those with incomes over $50,000 and 9.7 points (63 extra filings) among those with privately securitized loans. Among black borrowers living in black neighborhoods the potential losses stood at $3.5 million.

The remaining two panels show that the aftereffects of cumulative disadvantage are vastly lower for blacks in white areas and more so among whites in black areas. Compared with the 90 excess foreclosure filings estimated for all blacks only 19 were estimated for those in white tracts; and because refinance lending was more likely in black tracts where borrower equity was greater, less than $1/15^{th}$ of the threatened black homeowner equity was in white tracts. Among whites in black areas, the observed, predicted, and excess rates of foreclosure were far smaller and only an estimated $361,000 in excess equity was threatened as a result of cumulative disadvantage in lending.

Loss of Wealth

The repossession of a home is catastrophic for any family, implying not only the loss of a place to live but a significant decrease in family financial assets. Home equity is the most important source of wealth for most American families and the loss of a home through foreclosure and repossession implies a major drop in a wealth and the security associated with it. Our general assumption is also that foreclosure is a bad thing, though under certain circumstances some might consider it “rational” to walk away from a home that is worth less than what is owed. According to Gerardi et al. (2013), however, only 6 percent of defaulters have both negative equity and enough assets to make even one month's mortgage payment, thus potentially qualifying as “strategic defaulters;” individual unemployment is by far the strongest predictor of default (see Owens 2013). Moreover, whatever their motivations, defaulters suffer a major hit to their credit ratings, making it much more difficult to obtain loans and severely restricting their ability to smooth consumption and build wealth. Thus we

are comfortable in maintaining that foreclosure is a bad outcome and is only financially beneficial under very unusual and rare circumstances.

Up until now we have only documented the accumulation of loss in the form of curtailed income, greater risk, and equity threatened, but with housing wealth still intact. In Table 5 we culminate our analysis by estimating the number of excess homes repossessed and the predicted loss of wealth from home equity as a result of excess forfeiture. For each group—black borrowers, borrowers in black tracts, blacks in black tracts, blacks in white tracts, and whites in black tracts—we compute the average home equity at the time of foreclosure filing and then at repossession and multiply these values by the estimated number of excess filings and repossessions to derive the amount of threatened home equity and the actual lost in wealth through repossession experienced by these borrowers.

As expected, the frequency of home loss to repossession is lower than home foreclosure filings but is still elevated—in excess of 10% across most groups. In the middle panel we see that black borrowers in black neighborhoods would have experienced a home loss rate of 6.2% if they had been treated the same as white borrowers in white neighborhoods, compared with an observed rate of 10.9% or a gap of 4.7 points or 46 extra housing units. Once again, home loss was more likely for affluent home owners and the racial gap was bigger. Whereas the likelihood of home loss for blacks in black neighborhoods would have been 5.8% had they been treated the same as whites, the observed figure was nearly double at 12.9%, yielding a gap of 7.1 points or 36 extra home losses. The racial gap did not differ very much for privately securitized loans, with a predicted likelihood of 8.0% compared with an observed figure of 13.5% and 36 additional home losses.

We estimate that 53 of the 90 excess homes in foreclosure were repossessed with an average equity at the time of repossession of almost $40,000, yielding a total excess loss of nearly $2.1 million in wealth from Baltimore's black community. Among borrowers living in majority black tracts actual excess losses were close to $1.9 million. Among black borrowers living in black neighborhoods the actual excess losses stood at almost $2.0 million, demonstrating the tremendous disproportionate burden of racial disadvantage borne by black communities. Among both black borrowers generally and those living in black neighborhoods, the actual excess losses were greatest for the most affluent homeowners, totaling $2.1 million in the former case and $1.3 million in the latter.

DISCUSSION

Our research contributes to a long line of work connecting the historical formation of race in the United States to distributions of income and wealth and the intergenerational transmission of disadvantage (Anderson 2010; Beeman, Glasberg, and Casey 2011; Conley 1999; Harris 1993; Freund 2007; Oliver and Shapiro 1995; Sharkey 2013). Using a strong theoretical model and reliable empirical estimates, we document a clear and consistent pattern of racial disparities that suggest significant racial discrimination occurs across successive phases of mortgage lending carried out by a major financial institution in a major American city. We have illustrated the pathways by which racial disadvantage and racial discrimination in lending end up diminishing opportunities for home ownership, wealth

accumulation, and social mobility among African Americans through a process of serial displacement (Saegert et al. 2011). Holding constant the underwriting criteria observed by lenders, basic loan characteristics, and contextual circumstances at the tract, zip code, and city levels we document systematic racial disparities consistent with institutional discrimination against black individuals and black neighborhoods at successive stages of the lending process. As a result, African Americans were disproportionately likely to receive higher cost and higher risk loans, which in turn lowered their disposable incomes and put them at greater risk of foreclosure and repossession.

After properly accounting for the excess costs and risks they experienced, we estimated the excess incidence of foreclosure and home loss among black borrowers and residents of black neighborhoods relative to comparable white households and residents of white neighborhoods. Consistent with prior research, we found that black borrowers not only likely experienced individual discrimination with respect to the costs and risks of the lending products they received, but also faced higher costs and risks for living in predominantly black neighborhoods (see Shapiro 2005, 2006). The average black borrower in Baltimore paid an estimated $1,739 in excess mortgage payments from the time of loan origination and the average black borrower living in a black neighborhood expended $1,861 in excess mortgage payments. Over the life of a 30 year loan, these racial disparities would total $14,904 and $15,948, respectively, forcefully illustrating how prior disadvantage and systemic discrimination in mortgage lending produces an ever-growing cumulative disadvantage for African Americans over time, income that might otherwise have been put into savings, invested in children's education, allocated to promote health, or improve living standards (Botein 2013; Conley 1999).

As Sharkey (2013) has shown, the cumulative disadvantages associated with black race and black neighborhoods interact powerfully to account for the stalled progress of black social mobility across generations in contemporary America. Consistent with sociological research on the black middle class (Cose 1993; Collins 1997; Feagin and Sikes 1994; Hochschild 1995; Lacy 2007, 2012; Pattillo-McCoy 1999, 2000) higher socioeconomic status by no means protects families from systematic discrimination, especially when they live in black neighborhoods. Indeed, higher status may even exacerbate potential losses to black income and wealth (Anacker and Carr 2011; Bocian et al. 2011; Botein 2013; Faber 2013; Lacy 2012). Compared with $14,904 for all African Americans, the projected cumulative cost of discrimination for blacks earning over $50,000 per year was $19,026. Our findings thus confirm those of Faber (2013), who documents higher rates of subprime lending for higher income blacks, and Anacker and Carr (2011) and Bocian et al. (2011), who report higher rates of foreclosure for upper class blacks net of other factors.

In addition, although much attention has focused on the role of government sponsored enterprises such as Fannie Mae and Freddie Mac in fomenting the mortgage crisis (Acharya et al. 2011; Morgenson and Rosner 2011), our analysis highlights the central role played by private interests in structuring elevated racial disparities in high-cost, risky lending. Whereas the average black borrower in Baltimore paid a yearly excess of $497, among those whose mortgages were privately securitized, the differential more than doubled, rising to $1,067, a disparity that potentially accumulates to $32,000 over the life of the loan.

Not only were black borrowers more likely to receive more costly mortgages on the basis of race and neighborhood composition, they were also more likely to be channeled into riskier loan products. After controlling for underwriting criteria, loan characteristics, and contextual factors, the likelihood of receiving a combined risk loan (a high cost loan with at least two additional risk factors) was greater for black than white borrowers (45% versus 31.9%) and greater for black borrowers living in black neighborhoods than for whites living in white neighborhoods (46.3% versus 32.8%). Once again the key role played by private financial institutions is highlighted by the fact that black borrowers with privately securitized mortgages were 42% more likely to receive a combined risk loan relative to comparable white borrowers. As a result of the excess higher costs and risks experienced by black borrowers, they experience foreclosure and repossession of their homes. Because of racial disparities consistent with discrimination, the cumulative cost to African Americans could be quite high. For example, black borrowers in Baltimore were threatened with $3.8 million in potential losses from repossession and nearly $2.1 million had already been lost from the black community as of 2012.

Our findings illustrate how the serial displacement of capital identified by Saegert et al. (2011) acts cumulatively to undermine the well-being of black individuals and communities. Our findings also lend support to the contention that discrimination today is obscured by neutral rhetoric but systemically embedded in social structures and institutions (Bonilla-Silva 1997, 2013; Coates 2014; Desmond and Emirbayer 2009; Feagin 2014). Interlocking systems of racial discrimination in housing and credit markets may lead to the displacement of capital for both black individuals and collectively for black communities through a variety of direct and indirect pathways. Discrimination in housing markets, both directly against black home seekers and indirectly through the implementation of restrictive zoning regimes in suburbs (Massey et al. 2013; Rothwell and Massey 2009), continues to promote high levels of racial segregation in the United States, particularly in large urban black communities such as Baltimore (Rugh and Massey 2013).

The current housing crisis is only the latest manifestation of America's longstanding racial divide (Coates 2014; Hirsch 1983; Massey and Denton 1993; Sagalyn 1983; Sugrue 1996; Satter 2009). Mechanisms of discrimination continue to be structured by ongoing patterns of racial segregation and serve actively to perpetuate racial inequality today (Anderson 2010; Rugh and Massey 2010). In the context of persistent racial segregation, the dual housing market that has historically characterized urban America has not disappeared, though the denial of capital to black neighborhoods due to redlining gave way to the displacement of capital from black neighborhoods through reverse redlining and predatory lending.

We hypothesize that similar race gaps in lending and foreclosure owing partly to discrimination exist in other cities with similar patterns of racial segregation, wealth inequality, and homeownership disparities. However, the racial disparities we uncovered and the discriminatory processes we inferred in Baltimore might differ in other locations if there was significant variation across metropolitan areas in our independent variables. Notwithstanding the limitations, we maintain that our estimates may be generalized to large metropolises where blacks are highly hypersegregated—home to around half of all urban African Americans in 2000 (Iceland and Wilkes 2004; Massey 2004).

Our analysis of the relationship between residential segregation, suspected discrimination in lending, spatially concentrated foreclosures, racially disparate repossessions, and the consequent losses of black income and wealth informs the process of cumulative racial stratification and illustrates how racial inequalities continue to be generated in post-civil rights America. We hope our analysis provides useful information for those policymakers who allocate funds, focus resources geographically, and design solutions to prevent the next crisis, particularly reforms to consumer protection and the flawed private securitization market.

In addition to our quantitative analysis, future research will include a qualitative analysis of depositions made available in the City of Baltimore v. Wells Fargo lawsuit. These data include in-depth interviews with financial employees who frankly describe the racialized process by which mortgages were marketed and sold to black clients, as well as interviews with mortgage clients who describe the treatment they received. Further research should also be conducted on how the loss of wealth documented in this paper leads to disadvantage in other spheres of life such as health (Jones, Squires, and Ronzio 2014; Saegert et al 2011; Cagney et al. 2014), education (Ravitch 2013), identity (McCormack 2014; Ross and Squires 2011), and economic mobility (Chetty et al. 2014; Sharkey 2013). Future studies can be connected to deepen theoretical models of subprime lending as a form of cumulative disadvantage. In the end, we hope we have contributed to a better understanding of the processes by which interlocking systems of discrimination act cumulatively over time and across space to promote disadvantage and continue to make the United States a racially stratified society.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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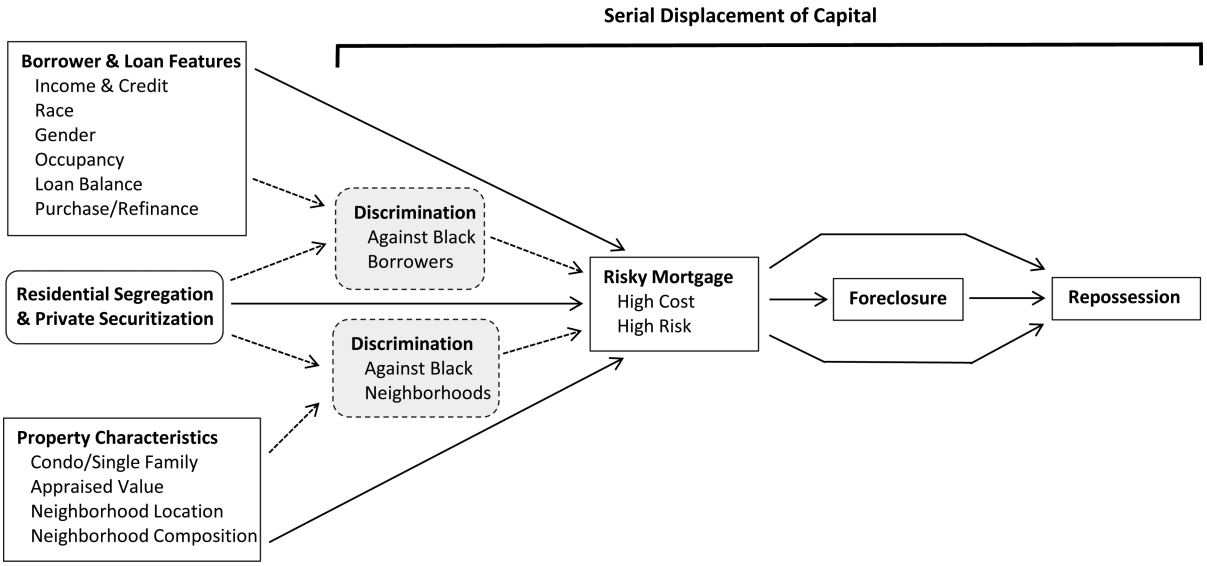

Figure 1.
Model of Cumulative Disadvantage

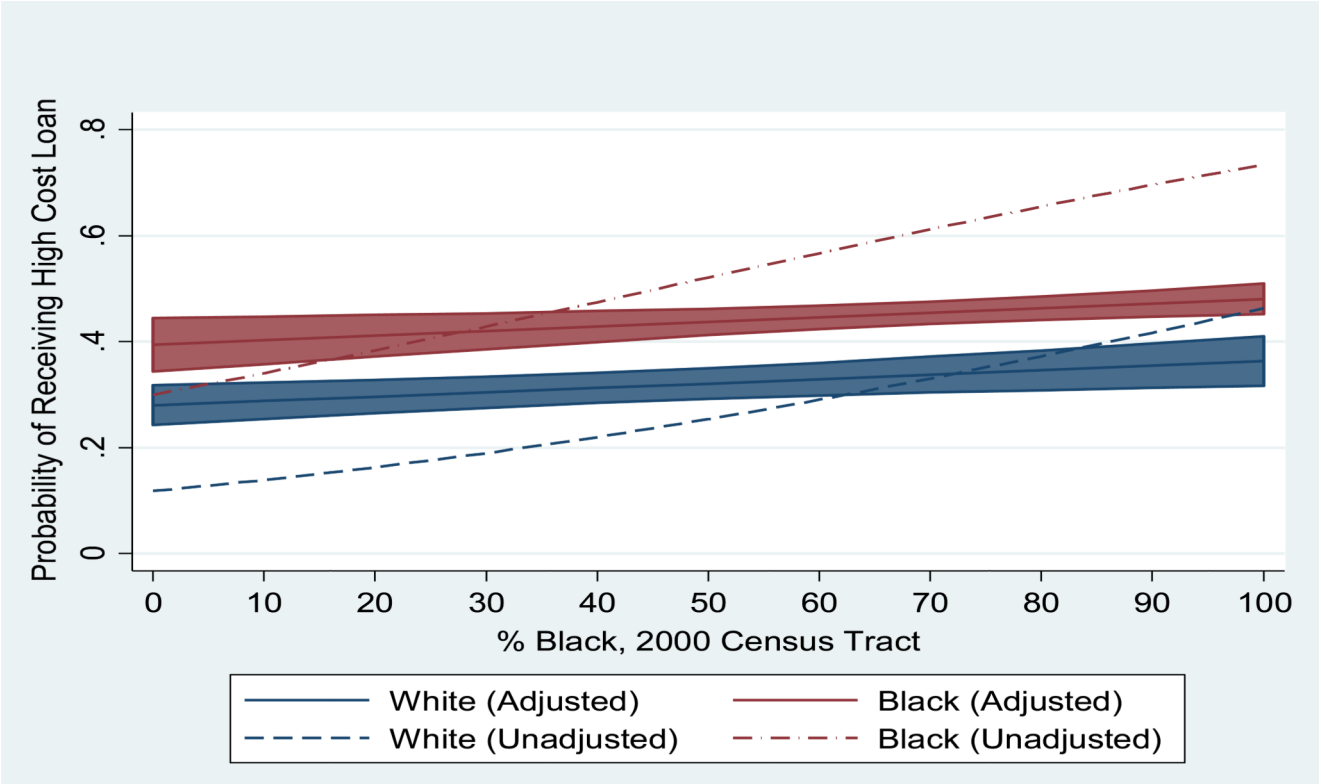

Figure 2.
High Cost Subprime Lending by Race and Tract Composition Unadjusted vs. Adjusted Margins (with 95% Confidence Bands)

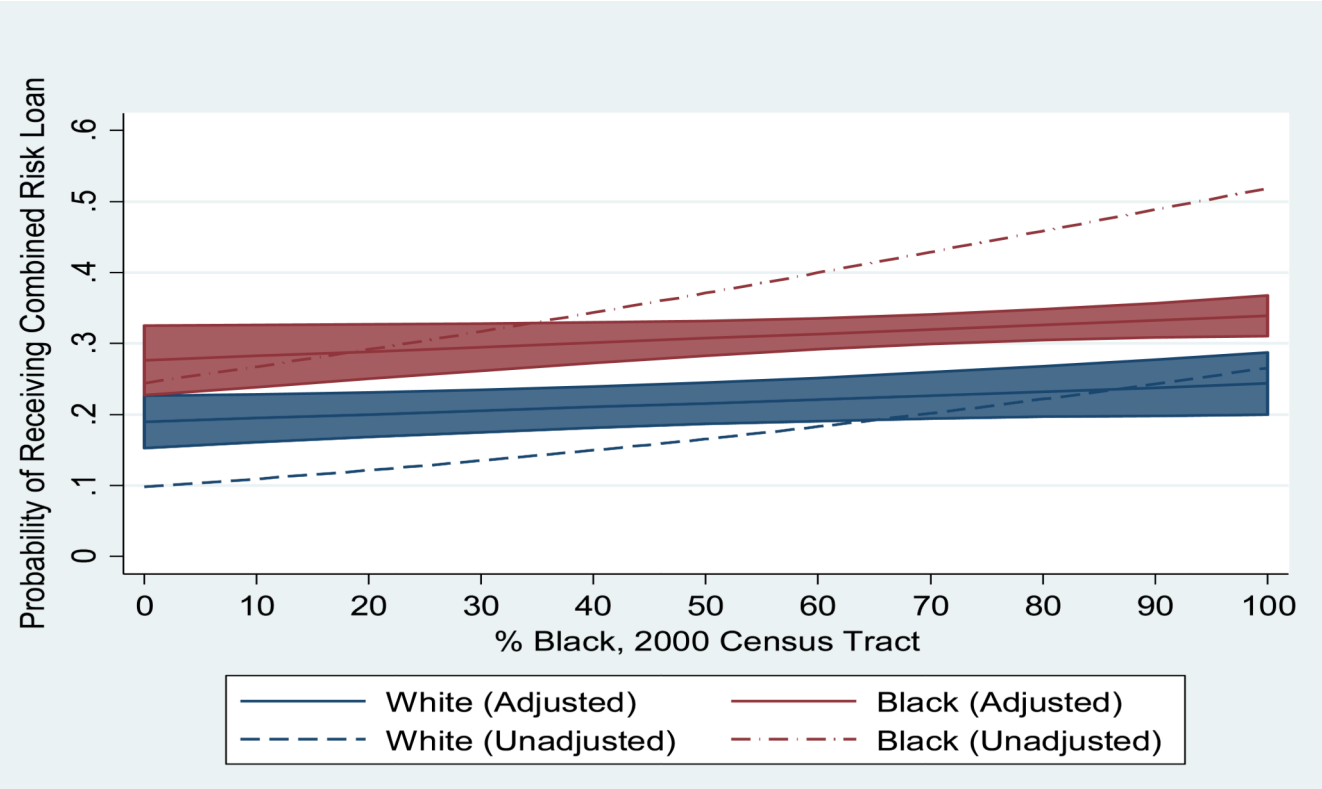

Figure 3.
Combined Risk Lending by Race and Tract Composition Unadjusted vs. Adjusted Predictive Margins (with 95% Confidence Bands)

Table 1

Summary Statistics for Black and White Borrower Sample

	Black Borrowers			White Borrowers		
	N	**Mean**	**S.D.**	**N**	**Mean**	**S.D.**
High Cost Subprime Loan	1,242	0.64	0.48	1,218	0.18	0.39
Combined Risk Loan *	1,259	0.45	0.50	1,267	0.13	0.33
Total Combined Risks	1,259	1.95	1.58	1,267	1.33	1.55
Ever Received Foreclosure Notice (L*is Pendens*)	1,196	0.18	0.38	1,235	0.06	0.23
Lost Home to Foreclosure	1,196	0.11	0.31	1,235	0.04	0.19
Investor Occupant	1,259	0.31	0.46	1,267	0.19	0.39
Borrower is a Woman	1,246	0.54	0.50	1,264	0.33	0.47
No Co-signer on Mortgage	1,259	0.83	0.38	1,267	0.64	0.48
Borrower Income ($1,000s)	1,206	81.22	186.13	1,234	122.44	150.54
Income < $40,000	1,206	0.29	0.45	1,234	0.10	0.30
$40,000 <= Income < $70,000	1,206	0.35	0.48	1,234	0.25	0.44
$70,000 <= Income < $100,000	1,206	0.17	0.38	1,234	0.20	0.40
$100,000 <= Income < $150,000	1,206	0.11	0.31	1,234	0.21	0.41
Income >= $150,000	1,206	0.08	0.27	1,234	0.24	0.42
Borrower FICO Credit Score	1,246	653.39	71.77	1,258	710.59	63.91
Credit Score >= 660	1,246	0.43	0.50	1,258	0.79	0.41
Condominium Property	1,259	0.06	0.24	1,267	0.11	0.31
Loan-to-Value (LTV) Ratio	1,245	76.26	18.55	1,260	73.78	16.74
Combined LTV Ratio	1,245	78.34	18.11	1,260	75.95	17.64
CLTV <= 80%	1,245	0.52	0.50	1,260	0.67	0.47
81% <= CLTV <= 90%	1,245	0.29	0.45	1,260	0.17	0.37
91% <= CLTV <= 95%	1,245	0.08	0.28	1,260	0.08	0.28
96% <= CLTV <= 100%	1,245	0.10	0.31	1,260	0.08	0.26
Original Loan Balance ($)	1,259	111,020	80,728	1,267	225,089	152,118
Amortization Term (months)	1,259	359.02	55.39	1,267	350.34	47.79
Purchase Loan	1,259	0.44	0.50	1,267	0.62	0.48
Home Improvement Loan	1,259	0.04	0.20	1,267	0.04	0.21
Refinance Loan	1,259	0.56	0.50	1,267	0.38	0.48
Cash-out Refinance Loan	1,259	0.41	0.49	1,267	0.20	0.40
Low/No Documentation Loan	1,259	0.15	0.36	1,267	0.16	0.37
Interest Only Amortization	1,259	0.05	0.21	1,267	0.16	0.36
Prepayment Penalty Clause	1,243	0.48	0.50	1,240	0.14	0.35
Adjustable Rate Mortage (ARM)	1,259	0.37	0.48	1,267	0.25	0.43
2/28 ARM	1,259	0.26	0.44	1,267	0.07	0.26
3/27 ARM	1,259	0.07	0.26	1,267	0.02	0.15

	Black Borrowers			White Borrowers		
	N	**Mean**	**S.D.**	**N**	**Mean**	**S.D.**
5/25 or 10/20 ARM	1,259	0.04	0.19	1,267	0.13	0.33
Balloon Loan	1,259	0.10	0.29	1,267	0.02	0.15
Private Label Securitization	1,259	0.70	0.46	1,267	0.46	0.50
Freddie Mac Securitization	1,259	0.30	0.46	1,267	0.54	0.50
Originated from 2000 to 2003	1,259	0.02	0.12	1,267	0.04	0.19
Originated in 2004	1,259	0.04	0.19	1,267	0.07	0.26
Originated in 2005	1,259	0.20	0.40	1,267	0.19	0.39
Originated in 2006	1,259	0.49	0.50	1,267	0.37	0.48
Originated in 2007	1,259	0.18	0.38	1,267	0.23	0.42
Originated in 2008	1,259	0.07	0.26	1,267	0.10	0.30
Tract % Black, 1990	1,259	64.67	35.66	1,267	19.17	27.93
Tract % Black, 2000	1,259	76.59	26.51	1,267	26.98	30.05
Tract % Black, 2010	1,259	80.59	23.41	1,267	30.06	30.58
0% - 50% Black, 2000	1,259	0.19	0.39	1,267	0.79	0.41
50% - 100% Black, 2000	1,259	0.81	0.39	1,267	0.21	0.41
1990-2000 Change % Black > 10%	1,259	0.41	0.49	1,267	0.28	0.45
Tract % College Graduates, 2000	1,259	14.78	11.80	1,267	29.93	21.75
% College Graduates <10%, 2000	1,259	0.39	0.49	1,267	0.21	0.41
Tract % in Poverty >= 40%, 2000	1,259	0.06	0.24	1,267	0.03	0.18
Tract % Foreclosure Rate, 2000	1,259	2.69	0.97	1,267	1.91	1.13
Tract % Foreclosure Rate, End of Loan	1,176	2.89	0.98	1,234	2.32	1.07
Tract % Rise in Home Values, 2000-Peak	1,259	139.45	64.67	1,267	168.18	75.88
% Fall in Zip Code Home Values since Peak	1,259	40.00	7.99	1,267	35.51	8.18
Zip Code % Black, 2010	1,259	71.09	20.38	1,267	37.22	22.92
Zip Code Median Credit Score <660	1,259	0.63	0.10	1,267	0.49	0.13
Change City Unemployment Rate since Origination	1,164	2.37	2.38	1,229	3.15	2.01

Data sources: Authors' matching of 2000-2008 Home Mortgage Disclosure Act Loan Application Register (HMDA LAR) data with 2000-2008 loan-level collateral file records from Private Label Mortgage-backed Securities (MBS) and Freddie Mac MBS; and merging of 1990-2010 Decennial Census tract- and zip code-level data, data on 2000-2009 tract foreclosures and home sales prices from the Baltimore Neighborhood Indicators Alliance, data on 2000-2010 zip code home value index from Zillow.com, and data on 2000-2010 monthly unemployment rates for Baltimore city County from the Bureau of Labor Statistics.

*Combined Risk Loan consists of High Cost Subprime Loans with at least two additional high risk features: Adjustable Rate, Interest Only Amortization, Low/No Documentation, CLTV>90%, Balloon, Prepayment Penalty, or Debt-to-

Table 2

Estimated Cost of Cumulative Disadvantage in Baltimore

		Cost of Cumulative Disadvantage: Excess Amounts Paid			
	N	**As % of Monthly Payment**	**Annual Excess Amount Paid**	**Excess over Observed Life of Loan**	**Excess over Projected 30 Year Term**
Black Borrowers (vs. White Borrowers)					
All Black Borrowers	***1,259***	5.3%	$497	$1,739	$14,904
Borrower Income over $50,000	***696***	6.0%	$634	$2,220	$19,026
Private Label Securitization Loans	***877***	11.1%	$1,067	$3,733	$32,000
All Borrowers in Black Tracts (vs. All Borrowers in White Tracts)					
All Borrowers in Black Tracts	***1,288***	2.9%	$255	$894	$7,664
Borrower Income over $50,000	***742***	3.7%	$359	$1,256	$10,768
Private Label Securitization Loans	***847***	7.5%	$660	$2,308	$19,786
Black Borrowers in Black Tracts (vs. White Borrowers in White Tracts)					
Black Borrowers in Black Tracts	***946***	6.4%	$532	$1,861	$15,948
Borrower Income over $50,000	***494***	7.2%	$651	$2,277	$19,516
Private Label Securitization Loans	***655***	11.3%	$954	$3,339	$28,616
Black Borrowers in White Tracts (vs. White Borrowers in White Tracts)					
Black Borrowers in White Tracts	***242***	4.8%	$647	$2,265	$19,415
Borrower Income over $50,000	***159***	4.8%	$762	$2,667	$22,864
Private Label Securitization Loans	***167***	9.7%	$1,405	$4,916	$42,138
White Borrowers in Black Tracts (vs. White Borrowers in White Tracts)					
White Borrowers in 50%-100% Black Tracts	***271***	1.8%	$187	$654	$5,609
Borrower Income over $50,000	***205***	2.3%	$269	$941	$8,068
Private Label Securitization Loans	***137***	6.4%	$679	$2,377	$20,376

Note: Excess amount paid equals average adjusted predictive margins for monthly payment estimated as an outcome in Appendix Table 1 subtracted from the actual observed mean payment for the sub-sample in each row . Average observed life of loan is 42 months for loans that never entered foreclosure, 29 months for loans in foreclosure, and 28 months for loans that ended in foreclosure and home reposession

Table 3

Estimated Excess Risk Due to Cumulative Disadvantage in Baltimore

		Combined Risk Lending		
	N	**Observed Incidence**	**Adjusted Prediction**	**Excess Incidence**
Black Borrowers (vs. White Borrowers)				
All Black Borrowers	***1,259***	45.0%	30.2%	14.8%
Borrower Income over $50,000	***698***	41.2%	30.5%	10.7%
Private Label Securitization Loans	***877***	63.6%	42.9%	20.7%
All Borrowers in Black Tracts (vs. All Borrowers in White Tracts)				
All Borrowers in Black Tracts	***1,288***	41.8%	29.3%	12.5%
Borrower Income over $50,000	***743***	37.2%	29.0%	8.2%
Private Label Securitization Loans	***847***	62.7%	40.9%	21.8%
Black Borrowers in Black Tracts (vs. White Borrowers in White Tracts)				
Black Borrowers in Black Tracts	***1,016***	46.3%	31.2%	15.1%
Borrower Income over $50,000	***538***	42.2%	31.0%	11.2%
Private Label Securitization Loans	***709***	65.3%	44.5%	20.8%
Black Borrowers in White Tracts (vs. White Borrowers in White Tracts)				
Black Borrowers in White Tracts	***243***	39.9%	14.2%	25.7%
Borrower Income over $50,000	***160***	37.5%	15.0%	22.5%
Private Label Securitization Loans	***168***	56.6%	21.1%	35.4%
White Borrowers in Black Tracts (vs. White Borrowers in White Tracts)				
White Borrowers in 50%-100% Black Tracts	***272***	25.0%	16.3%	8.7%
Borrower Income over $50,000	***205***	23.9%	16.2%	7.7%
Private Label Securitization Loans	***138***	49.3%	28.9%	20.4%

Note: Excess amount paid equals average adjusted predictive margins for probability of combined risk lending in Appendix Table 1 subtracted from the actual observed mean for the sub-sample in each row . Note: Combined Risk Loan consists of High Cost Subprime Loans plus at least two additional high risk features: Adjustable Rate, Interest Only Amortization, Low/No Documentation, CLTV>90%, Balloon, Prepayment Penalty, or Debt-to-Income Ratio > 55%. See text for more details.

Table 4

Excess Foreclosure Filings and Home Equity Threatened Due to Cumulative Disadvantage in Baltimore

		Entered Foreclosure						
	N	Observed	Predicted	Excess Difference	Total Foreclosure Filings	Excess Foreclosure Filings	Mean Home Equity Threatened	Total Excess Home Equity Threatened
Black Borrowers (vs. White Borrowers)								
All Black Borrowers	***1,196***	17.9%	10.4%	7.5%	214	90	$41,848	$3,766,304
Borrower Income over $50,000	***661***	19.4%	7.7%	11.6%	128	77	$38,317	$2,950,383
Private Label Securitization Loans	***814***	23.0%	13.8%	9.2%	187	75	$40,583	$3,043,762
All Borrowers in Black Tracts (vs. All Borrowers in White Tracts)								
All Borrowers in Black Tracts	***1,421***	15.4%	11.4%	4.0%	219	57	$44,851	$2,556,518
Borrower Income over $50,000	***816***	15.6%	10.0%	5.6%	127	46	$42,488	$1,954,464
Private Label Securitization Loans	***897***	21.3%	15.3%	6.0%	191	54	$41,927	$2,264,033
Black Borrowers in Black Tracts (vs. White Borrowers in White Tracts)								
Black Borrowers in Black Tracts	***962***	17.2%	9.3%	7.9%	165	76	$46,521	$3,535,592
Borrower Income over $50,000	***506***	18.8%	7.8%	11.0%	95	55	$43,268	$2,379,763
Private Label Securitization Loans	***655***	22.0%	12.3%	9.7%	144	63	$44,179	$2,783,276
Black Borrowers in White Tracts (vs. White Borrowers in White Tracts)								
Black Borrowers in White Tracts	***234***	20.9%	12.8%	8.1%	49	19	$26,465	$502,843
Borrower Income over $50,000	***155***	21.3%	11.7%	9.6%	33	15	$24,362	$365,426
Private Label Securitization Loans	***159***	27.0%	17.3%	9.8%	43	16	$26,557	$424,917
White Borrowers in Black Tracts (vs. White Borrowers in White Tracts)								
White Borrowers in 50%-100% Black Tracts	***262***	10.7%	6.8%	3.9%	28	10	$36,094	$360,937
Borrower Income over $50,000	***198***	10.1%	6.3%	3.8%	20	8	$35,475	$283,802

		Entered Foreclosure						
	N	Observed	Predicted	Excess Difference	Total Foreclosure Filings	Excess Foreclosure Filings	Mean Home Equity Threatened	Total Excess Home Equity Threatened
Private Label Securitization Loans	***128***	19.5%	12.7%	6.9%	25	9	$30,750	$276,750

Note: White tracts label refers to 0%-50% black tracts and black tracts label refers to 50%-100% black tracts. The predicted foreclosure rates are average adjusted predictive margins based on what rates among corresponding borrowers for each row in the table would experience given observed characteristics along with predicted monthly loan payments and predicted probabilities of receiving a combined risk loan had they received equal treatment as similarly situated borrowers in the comparison group in parentheses. Home equity at time of foreclosure calculated for all borrowers who ever entered a foreclosure using information on combined loan-to-value ratio at origination, monthly payment, interest rate and amortization schedule, adjustable rate resets, interest only amortization, and zip code home price change (appreciation/depreciation in underlying property value). Equity is diminished by accrued interest for deliquent loans and calculated using the actual current balance recorded by the latest monthly update to the mortgage-backed securities files; mean home equity includes borrowers with negative equity. For a small number of loans the actual current deliquent balance is estimated by assuming 120 days delinquent for loans entering foreclosure, consistent with average timeline of judicial foreclosure in Maryland during the period of study. Average adjusted predictive margins estimations exclude 6 borrowers who received loan modifications and also entered foreclosure. See text for further explanation.

Table 5

Excess Homes Lost to Foreclosure and Home Equity Lost Due to Cumulative Disadvantage in Baltimore

		Lost Home to Foreclosure						
	N	Observed	Predicted	Excess Difference	Total Homes Lost	Excess Homes Lost	Mean Home Equity Lost	Total Excess Home Equity Lost
Black Borrowers (vs. White Borrowers)								
All Black Borrowers	***1,196***	11.1%	6.6%	4.4%	132	53	$39,838	$2,111,423
Borrower Income over $50,000	***661***	12.9%	5.1%	7.8%	85	52	$40,264	$2,093,722
Private Label Securitization Loans	***814***	13.4%	8.8%	4.7%	109	38	$37,395	$1,420,997
All Borrowers in Black Tracts (vs. All Borrowers in White Tracts)								
All Borrowers in Black Tracts	***1421***	9.9%	6.7%	3.3%	141	46	$40,967	$1,884,490
Borrower Income over $50,000	***816***	10.4%	6.5%	4.0%	85	32	$40,616	$1,299,708
Private Label Securitization Loans	***897***	13.3%	8.7%	4.6%	119	41	$37,728	$1,546,860
Black Borrowers in Black Tracts (vs. White Borrowers in White Tracts)								
Black Borrowers in Black Tracts	***962***	10.9%	6.2%	4.7%	105	46	$42,902	$1,973,488
Borrower Income over $50,000	***506***	12.9%	5.8%	7.1%	65	36	$41,836	$1,506,091
Private Label Securitization Loans	***655***	13.5%	8.0%	5.5%	88	36	$39,100	$1,407,585
Black Borrowers in White Tracts (vs. White Borrowers in White Tracts)								
Black Borrowers in White Tracts	***234***	11.5%	8.6%	2.9%	27	7	$27,924	$195,465
Borrower Income over $50,000	***155***	12.9%	8.2%	4.7%	20	7	$35,155	$246,085
Private Label Securitization Loans	***159***	13.2%	11.9%	1.3%	21	2	$30,250	$60,501
White Borrowers in Black Tracts (vs. White Borrowers in White Tracts)								
White Borrowers in 50%-100% Black Tracts	***262***	7.3%	5.5%	1.8%	19	5	$27,589	$137,947
Borrower Income over $50,000	***198***	6.6%	5.3%	1.3%	13	3	$22,406	$67,218

		Lost Home to Foreclosure						
	N	**Observed**	**Predicted**	**Excess Difference**	**Total Homes Lost**	**Excess Homes Lost**	**Mean Home Equity Lost**	**Total Excess Home Equity Lost**
Private Label Securitization Loans	***128***	13.3%	10.3%	3.0%	17	4	$19,998	$79,990

Note: White tracts label refers to 0%-50% black tracts and black tracts label refers to 50%-100% black tracts. The predicted foreclosure rates are average adjusted predictive margins based on what rates among corresponding borrowers for each row in the table would experience given observed characteristics along with predicted monthly loan payments and predicted probabilities of receiving a combined risk loan had they received equal treatment as similarly situated borrowers in the comparison group in parentheses. Home equity at time of foreclosure calculated for all borrowers who ever entered a foreclosure using information on combined loan-to-value ratio at origination, monthly payment, interest rate and amortization schedule, adjustable rate resets, interest only amortization, and zip code home price change (appreciation/depreciation in underlying property value). Equity is diminished by accrued interest for deliquent loans and calculated using the actual current balance recorded by the latest monthly update to the mortgage-backed securities files; mean home equity includes borrowers with negative equity. For a small number of loans the actual current deliquent balance is estimated by assuming 270 days delinquent for completed foreclosures, consistent with average timeline of judicial foreclosure in Maryland during the period of study. Average adjusted predictive margins estimations exclude 6 borrowers who received loan modifications and also entered foreclosure. See text for further explanation.