Inequity by Default:

Metropolitan Foreclosure, Housing Supply, and Racial Residential Segregation*

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Abstract

The devastating consequences of the Great Recession on individuals and households across the United States are well-documented and far-reaching. However, few studies have attempted to connect the housing crisis with spatial patterns of racial and ethnic segregation in American cities. This study is among the first to investigate the impact of concentrated home mortgage foreclosure on processes of racial residential segregation in the U.S. I combine metropolitan-level census data containing demographic, economic, and housing characteristics with a unique and expansive geocoded dataset covering nearly all foreclosure listings in the U.S. from 2005 to 2010. Results indicate that the concentration of foreclosure events does not affect changes in minority-white dissimilarity and isolation between 2000 and 2010. Nevertheless, associations between foreclosure concentration and several housing market conditions known to reshape racial residential segregation are significant and operate as hypothesized. More specifically, percent foreclosure predicts increases in internal migration and declines in both median housing value and rate of minority homeownership. Overall, these findings suggest the effects of the housing crisis on changes in racial residential segregation have not yet materialized but may occur in the future as foreclosures continue to influence important housing supply processes.

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The devastating consequences of the Great Recession on individuals and households across the United States are well-documented and far-reaching. The housing bust has been associated with postponing family formation (Morgan, Cumberworth, and Wimer 2011), increasing emergency room visits related to heart attack, stroke, and mental health (Currie and Tekin 2011), disrupting primary education (Been et al. 2011), and attracting deviance in the form of robbery and property crime (Arnio, Baumer, and Wolff 2012; Arnio and Baumer 2012; Baumer, Wolff, and Arnio 2012). Despite scholarly attention devoted to understanding the repercussions of the economic crisis, studies assessing the impact of concentrated home mortgage foreclosure on housing supply processes known to reshape racial residential segregation in U.S. metropolitan areas are sparse at best. Did variations in the concentration of foreclosures affect the urban housing market conditions capable of changing levels of black, Latino, and Asian segregation from whites, above and beyond historical and contemporary features of the metropolis?

I use a unique and expansive geocoded dataset containing almost all foreclosure listings in the U.S. for the six-year period from 2005 to 2010 to peruse this pending puzzle. Especially important for the purpose of my study is precise information on the geographic location of over five million foreclosure events, which I use to produce metropolitan-level measures, spanning the period of time before, during, and after the recession. The Neighborhood Change Database (NCDB), 2000 and 2010 decennial census surveys, 2008-2012 American Community Survey (ACS) 5-year estimates, and the Bureau of Labor Statistics provide data on the demographic, economic, and housing features of each metropolitan area.

This study mitigates a number of theoretical and methodological limitations that hamper previous analyses, thereby contributing to the literature in three key ways. First, I expand upon previous scholarship by identifying associations among metropolitan-level foreclosure concentration, housing supply features, and changes in racial segregation that are traditionally documented at lower levels of aggregation. I elaborate on these relationships by including a battery of contextual and compositional control variables. Second, I move beyond case studies of individual communities, counties, and cities, and cast a wider net to address the severe shortage in geographic coverage of the housing crisis by investigating all U.S. American metropolitan areas. Third, I leverage longitudinal data describing the housing crisis between 2005 and 2010 to establish temporal ordering among foreclosure events, housing market conditions, and segregation. The evaluation of foreclosure at the highest level of aggregation, across the entire urban population, and over the course of many years as opposed to single snapshots in time is important for resolving the ambiguity of past findings and understanding the extent to which segregation is influenced by structural changes to the American housing system.

The Foreclosure-Segregation Link: Housing Supply Processes

There are theoretical reasons to believe the surge in foreclosure activity during the 2007 financial crisis might have stalled or reversed post-Civil Rights Era progress toward greater integration by changing conditions of the housing market. To date, no empirical analysis of racial residential segregation has accounted for a measure of concentrated

home mortgage foreclosure, despite its ability to shake the demographic, economic, and housing features of a metropolitan area.

Evidence suggests the impact of the foreclosure crisis of 2007 was distributed unevenly across racial and ethnic groups. At the household-level, the prospects of experiencing a foreclosure have been significantly greater for black and minority families than for similarly positioned white families (Allen 2011). Subprime mortgages tend to be promoted to and spatially concentrated in lower-income, high-minority communities that experience more foreclosure (Delgadillo and Erickson 2006; Gerardi and Willen 2008; Lauria and Baxter 1999; Lauria 1998; Li 2011; Pedersen and Delgadillo 2007) at a much faster rate (Williams, Galster, and Verma 2013). Accordingly, metropolitan areas with larger shares of blacks and severe segregation from whites have greater concentrations of high-cost subprime loans prone to default and more foreclosure activity (Hyra et al. 2013; Rugh and Massey 2010). Racial differences in the likelihood of experiencing foreclosure should translate to racial disparities in housing supply processes that influence changes in the levels of residential segregation in a metropolitan area. The concentration of residential mortgage foreclosure could ultimately affect levels of segregation by spurring internal migration, inhibiting suburbanization among minorities, slashing property values, and decreasing the percent of minority owner-occupied housing units.

Data and Methods

Rich housing data on over five million foreclosure events were acquired through proprietary agreements between Cornell University, the University of Washington, and real estate firm RealtyTrac. Foreclosure records were compiled by RealtyTrac from the offices of county assessors in 2,860 of 3,143 U.S. counties. This unique, geocoded dataset covers nearly all foreclosure listings in the U.S. for the six-year period from 2005 to 2010. The final sample of foreclosure records used in this study is limited to the period of time between January 1, 2005 and April 1, 2010, when the Census Bureau begins enumerating the population. Data on demographic, economic, and housing characteristics in 2000 and 2010 were collected from the Neighborhood Change Database (NCDB) for all 366 metropolitan statistical areas (MSAs) as defined by the U.S. Office of Management and Budget (OMB) in 2009. Developed by GeoLytics, Inc, the NCDB normalizes tract boundaries as far back as 1970 to geographically match neighborhoods as they are defined in the 2010 decennial census survey. This consistency controls for the shifting nature of tract areas and allows for metropolitan-level aggregation without distortion. Data not available by way of the NCDB were collected from the 2000 and 2010 U.S. Census decennial surveys, the American Community Survey 5-year estimates for 2008-2012, and the U.S. Bureau of Labor Statistics. I limit the final sample to MSAs with at least 2,500 of each minority group because measures of segregation tend to be unstable for analyses with smaller populations (Logan, Stults, and Farley 2004; Timberlake and Iceland 2007).

Measuring the dependent variables. This study is interested in understanding post-recession urban housing market systems and the underlying factors prompting recent changes in two indicators of residential segregation between three racial-ethnic groups and whites as a function of metropolitan-level foreclosure density. With respect to housing supply characteristics, internal migration captures the volatility of a metropolitan area's housing market and is measured as the percentage of persons that moved within the MSA in the past year. The 2008-2012 ACS provides reliable estimates of local moves

at the metropolitan-level. This measure can be considered the percentage of people who moved at the tail-end of the recession in 2009. Minority suburbanization is measured as the percent of nonwhite residents living in the suburban rings located outside the principal cities of metropolitan areas. Metropolitan-level housing value is operationalized as the median dollar value of specified owner-occupied housing units. Specified houses are one-family houses on no more than 10 acres of land that do not contain a business or medical office on the property. The minority homeownership rate is derived by subtracting the total number of non-Hispanic/Latino white owner-occupied housing units from the total number of housing units divided by the total number of housing units.

Because my analysis investigates the effect of foreclosure concentration on changes in segregation over the last decade, my models incorporate the percent change in the index of dissimilarity ($D_{2010\text{-}2000}$) and the percent change in the within-group isolation index ($P^*_{2010\text{-}2000}$) estimated across census tracts. Measuring percent change in these two outcome variables captures the rate of change between two time periods to more accurately describe the relative difference in segregation within a city over time. The index of dissimilarity and isolation index are considered the most interpretable dimensions of segregation and are commonly used to assess the dissimilarities between whites and each minority group (i.e., black, Latino, and Asian) as well as the typical experience of each minority group coming into contact with white neighbors. Measures of segregation are calculated using data available through the US2010 project and Spatial Structures in Social Sciences initiative at Brown University.

Measuring the independent variables. The primary predictor in this analysis is the metropolitan-level foreclosure concentration. I derive my primary explanatory variable, percent foreclosure, from the cumulative number of foreclosed residential properties for each MSA between 2005-2010 divided by the estimated total number of housing units in the metropolitan area as provided by the 2000 Census decennial survey. Historical and contemporary features of the metropolitan context are exogenous to the foreclosure-segregation. These contextual and compositional characteristics of the MSA include region, age of the metro, industrial structure, population size, and minority representation.

Analytic strategy. I employ OLS regression techniques to fit two sets of models. The first set of models predict minority-white outcomes across percentage change in the two segregation indices, whereas the second set of models predict features of the urban housing market. To describe the basic association between racial residential segregation and metropolitan foreclosure, I regress the percentage change in the index of dissimilarity and percentage change in the isolation index for black-white, Latino-white, and Asian-white pairs on metropolitan-level foreclosure concentration. Multivariate regression models elaborate on these bivariate associations. In order to isolate the effects of foreclosure on segregation, I include confounding covariates reflecting the contextual and compositional arrangements of the metropolitan area known to shape racial and ethnic settlement patterns. As implicated by my theoretical framework, I test housing supply features as mediating variables to examine the mechanisms through which foreclosure at the metropolitan-level affects racial residential segregation. The final models are defined by equation 5:

$$Y = \alpha + \beta_1 \mathbf{Foreclosure} + \beta_2 \mathbf{Context} + \beta_3 \mathbf{Housing} + \varepsilon \quad (5)$$

where *Y* represents the percent change in the index of dissimilarity between 2000 and 2010 for black-white, Latino-white, and Asian-white dichotomies, or the percent change in the isolation index for black, Latino, and Asian groups; α is the intercept; **Foreclosure** is a vector of percent foreclosure values with coefficients β_1; **Context** is a set of ecological and compositional control variables with coefficients β_2 that represents region, age of the metropolitan area, functional specialization, log population size, percent black, percent Latino, and percent Asian; **Housing**[1] is a set of mediating variables with associated coefficients β_3 that represents percent internal migration, minority percent suburban, median housing value, percent vacant housing, percent rental housing, and new housing construction; ε is the error term.

Lastly, I model housing supply characteristics as individual outcomes in a series of regression equations that also account for third variables. Equation 6 specifies these four models:

$$Y = \alpha + \beta_1 \mathbf{Foreclosure} + \beta_2 \mathbf{Context} + \varepsilon \quad (6)$$

where *Y* represents percent internal migration, minority percent suburban, median housing value, or minority percent homeowners; α is the intercept; **Foreclosure** is a vector of percent foreclosure values with coefficients β_1; **Context** is a set of ecological and compositional control variables with coefficients β_2 that represents region, age of the metropolitan area, functional specialization, log population size, percent black, percent Latino, and percent Asian; ε is the error term.

Results

OLS regression coefficients suggest the independent effect of foreclosure concentration on measures of dissimilarity and isolation is not statistically significant, although several associations operate as hypothesized. For instance, non-significant positive coefficients suggest high-foreclosure metropolitan areas are associated with rising unevenness between minorities and whites. The effects of isolation, on the other hand, are less straightforward across these racial-ethnic groups. For black residents, the possibility of coming into contact with someone of the same race increases in urban housing markets with higher concentrations of foreclosure activity. The opposite is true for Latinos and Asians, for whom exposure to other groups increases with the proportion of foreclosed housing units. Moreover, it appears that housing supply processes mediate the foreclosure-segregation in models predicting change in minority isolation, though this conclusion is questionable given that the equations are not statistically significant.

Percent foreclosure had a significant positive independent effect on internal migration. The flood of foreclosures that accompanied the Great Recession increased volatility of urban housing markets, as indicated by the rate of local moves in 2009. The association between foreclosure concentration and minority suburbanization is not statistically significant. This finding counters the hypothesized negative association between foreclosure concentration and minority percent suburban. It is possible this relationship is not statistically significant because of the countervailing effects of Asian households that were lumped in with the potentially different effects of black and Latino experiences with suburbanization. Median housing value is also strongly positively associated with foreclosure concentration in metropolitan areas. The relationship between

[1] Minority percent homeowners was highly collinear with percent black and percent Latino and therefore excluded from the equations.

foreclosure concentration and minority homeownership further reveals the deleterious effects of the Great Recession on the capital acquisition and maintenance of blacks, Latinos, and Asians residing in American urban areas. The negative association is not surprising. Foreclosure concentration disproportionately affected minority homeowners who were most likely to purchase predatory loans.

Recent developments in the social science scholarship understand the impact of foreclosure on U.S. racial-ethnic dynamics to be precarious and uneven. Estimates from regression models provide support for and rebuttal against the hypothesized associations relating foreclosure concentration, housing supply processes, and changes in racial residential composition in post-Recession era U.S. American cities. Despite theoretical expectations, analyses of U.S. American metropolitan areas found no significant relationship between percent foreclosure and indicators of racial residential segregation between whites and three major racial-ethnic groups. The percentage of metropolitan-level foreclosure might not predict more residential segregation or intragroup contact among minorities, but associations hint at the possibility that black segregation and isolation increased following the Great Recession, while Latinos and Asians found integration to be more commonplace, though not necessarily with whites as indicated by these two groups' proclivity for more segregation.

Failure to reject the null hypotheses that the foreclosure crisis did not reshape residential segregation via housing supply characteristics counters much of the consensus in the literature evaluating similar associations at lower levels of aggregation. The Great Recession influenced a number of social, cultural, and economic dynamics in the U.S. since 2007 (Grusky, Western, and Wimer 2011), but it appears the egregious organization of racial-ethnic groups in urban neighborhoods was spared. Or, is it too soon to make complete claims on the outcomes presented in models of residential segregation and isolation? Indeed, foreclosure effects on segregation might take some time to happen as the Great Recession was declared officially over in 2009. Only 10 months later, the Census Bureau began enumerating the population for the 2010 decennial survey used in this study. The data available for modeling these outcomes might be inadequate for capturing the lagged effects of economic recessions. The aggregate effects of the foreclosure crisis on residential segregation may not have materialized yet. Perhaps most salient is the plausibility that the economic crisis and ensuing waves of mass foreclosure concentration might require more time to exact its toll on residential attainment processes. Foreclosure effects on several housing market conditions associated with segregation are foreboding. The percentage of foreclosures in a city appears to have already started reshaping several conditions of the urban housing market known to influence racial settlement patterns in metropolitan areas and might facilitate growing racial inequality in the coming years. Results from regression models assessing housing supply processes reveal that the percent of a city's housing supply that succumbs to foreclosure is associated with increased housing market volatility in the form of internal migration, shrinking home prices, and declining rates of homeownership among minority residents.

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