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HOUSING FORECLOSURE AND RACIAL TRANSITION IN NEW ORLEANS *

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Housing Foreclosure and Racial Transition in New Orleans

Abstract

We explore housing foreclosure as a mechanism that links economic shocks and neighborhood change, particularly the process of racial transition. A panel data set of the 1980 and 1990 New Orleans, Louisiana Census of Population and Housing was merged with mortgage foreclosure data aggregated to the block group level. The analysis indicates that housing foreclosures added momentum to the process of racial transition and neighborhood change, net of the effects of exogenous economic shocks and other variables like median income of residents, change in the value of owner-occupied housing, or the existing racial distribution of population in the neighborhood. Foreclosure appears to have the strongest effect on racial transition in block groups where resident incomes are above the lowest levels, and there is a pre-existing and increasing black population.

HOUSING FORECLOSURE AND RACIAL TRANSITION IN NEW ORLEANS

Recent changes in the global division of labor and the social structure of accumulation are associated with changes in both the spatial and opportunity structures of U.S. cities. The suburban relocation and decline of high wage manufacturing jobs are well documented. So are increases in lower paid service sector employment and the concentration of poverty and social problems among the lower-income, largely minority residents who remain in many large cities (Galster, Mincy, and Tobin 1997; Massey and Denton 1993; Morenoff and Tienda 1997; Squires 1994). Debates about the uneven effects of deindustrialization and the role of racial segregation and out-migration on spatial reorganization and poverty have been further complicated by the effects of changes in housing finance on the process of neighborhood change. Previously sheltered housing markets dominated by savings and loan institutions that issue fixed rate mortgages have been integrated into the larger financial system. This has increased the importance for housing finance of adjustable rate mortgages, secondary mortgage markets, and mortgage-backed securities (Florida 1986; Meyerson 1986; Shenker and Colletta 1992). Multiple economic shocks provide a context for the interplay of demographic and racial processes traditionally associated with change in neighborhood income levels and racial composition (Grigsby et al. 1987; Squires 1994, 3; Temkin and Rohe 1996).

We use New Orleans, Louisiana as a case-study to explore the potential of housing foreclosure as a mechanism that links economic shocks to neighborhood change, particularly the process of racial transition. The paper investigates housing foreclosure, the legal process

whereby a lender separates a delinquent borrower from a vested interest in mortgaged property. Economic shocks that reduce population and real incomes can be expected to decrease housing prices and the ratio of the market value of mortgages to the market value of houses, all of which are likely to increase mortgage default and foreclosure (Case and Shiller 1996; Cunningham and Capone 1990). New Orleans is an ideal setting for the study because it experienced a severe economic shock caused by falling oil prices, and because of its location as a Southern city outside the range of sites typically chosen to study racial transition (see Wood and Lee 1991). The question investigated here is whether housing foreclosures added momentum to the process of racial transition and neighborhood change in New Orleans, net of the effects of exogenous economic shocks, median income of residents, changes in the value of owner occupied housing, and the existing racial distribution of population.

We proceed with an elaboration of theories of neighborhood change and racial transition, an overview of recent changes in the economy of the New Orleans Metropolitan Statistical Area (MSA), changes in key economic and neighborhood indicators in the city itself. We conclude with a multivariate analysis of changes from 1980 to 1990 in the proportion of blacks who reside in census tract block groups within the city.

UNDERSTANDING NEIGHBORHOOD CHANGE AND RACIAL TRANSITION

Untangling how the interactions of race and class contribute to differences in urban neighborhoods is an extremely knotty problem. Various scholars argue about the extent to which neighborhood succession processes are determined by natural selection based on market

assumptions, institutional mechanisms related to capital accumulation or racial discrimination, or the aggregated preferences of competing individuals of diverse cultural heritage. William Grigsby and his colleagues state quite clearly that the geographic separation of households according to real income levels is at the core of the neighborhood succession process (Grigsby et al. 1987, 10). William J. Wilson (1987) agrees that changes in the structure of economic opportunity primarily explain the spatial distribution of poverty. He explains how economic restructuring shifted employment from the central city to the suburbs and from higher paying manufacturing jobs to lower paying service jobs, which interacted with black migration patterns to exacerbate the spatial distribution of urban poverty. Paul Jargowsky (1997, 144) similarly argues that structural change in the economy disadvantaged those with lower skill levels, and interacted with the suburbanization of employment to induce more affluent residents to flee cities, increasing the proportion of black ghetto dwellers who remained.

Douglas Massey and his colleagues counter that racial segregation itself is an institutional process that concentrates poverty, especially during economic downturns, and that race is more important than class to predict segregation (Eggers and Massey 1992; Massey and Denton 1993, 85). Other institutional arguments stress how neighborhood redlining by lenders, block busting by real estate agents, and restructuring of housing finance have increased racial segregation and neighborhood change (Galster 1992; Squires 1994).

Much of the neighborhood decline and urban revitalization literature is based on refinements by economists of research that originated with the Chicago School of human ecology (Bradbury, Downs, and Small 1982; Downs 1981; Faris 1967; Vernon 1960). The central contribution of this literature is the stage model of residential succession and decline.

According to the model, vigorous competition exists for city land which is prized for its accessibility to all parts of the metropolis. Business and industry often are able to outbid others for the most central locations. City growth increases competition for residential space, which intensifies development of land nearest the central business district (CBD). Resulting congestion and high density around the CBD drives out those with higher incomes who seek cheaper land and better housing on the urban fringe, provided the commute time to work is not too long (Muth 1969). Central city housing is converted into smaller units, and landlords invest decreasing amounts of money in maintenance and renovation of the aging housing stock. Less affluent (often minority) residents move in and eventually dominate the neighborhood as the deteriorating housing stock filters down the status hierarchy. The end result is families with similar socio-economic status and ethnic identity living together in different parts of the city.

Hypothesis 1:

Exogenous economic shocks that decrease median block group incomes catalyze neighborhood succession, as represented by population decline, lower median housing costs, and a larger percent black population.

Ecological and neo-classical economic models propose that the relative cost of housing and mean commute time to work allows individuals with sufficient income to choose a housing sub-market that suits their preferences. This not only helps construct middle and upper income housing sub-markets, it also constricts, via the filtering process, the location of lower-income sub-markets. An increase in the number of households causes a rearrangement of neighborhood

occupancy by income group, and population decline is likely to cause neighborhood succession because of the decrease in housing prices and rents. The essentials of filtering, and hence racial transition, can be boiled down to the depreciation or appreciation of housing prices and rents to reflect changes in the income profile of neighborhoods (Grigsby et al. 1987, 27, 37).

The neo-Marxian approach to neighborhood change links the combination of global shifts in capital accumulation and local contradictions between use value and exchange value to changes in income, rents, and housing prices. Post World War II economic development featured, among others things, state subsidies of suburban housing development to support expanded automobile production and increased demand for housing, consumer goods, and petroleum products (Aglietta 1978; Gordon, Edwards, and Reich 1982). David Harvey (1973) argues that increased investment in suburban development during this period sucked capital out of the central city, which triggered disinvestment and abandonment of aging housing stock in the CBD. Deterioration of central city neighborhoods created racial transition and a “rent gap” between existing rents and rents that could be charged under more profitable uses (Logan and Molotch 1987; Smith 1979). Pressures for urban renewal and neighborhood revitalization can also be understood in this context.

The uneven revitalization and decay of urban neighborhoods since the 1970 can be linked to the effects of shifts in the institutional basis of capital accumulation on local housing conditions. Among the factors to consider are the ways the saturation of demand for suburban housing and an overall restructuring of housing finance affected the flow of capital to finance inner city renewal. Competition from foreign automobile and steel producers, global shifts in control of petroleum resources, and reduced state subsidies of urban development represent other

important changes in long standing institutional supports of capital accumulation. Consequently, real income levels and the condition and value of housing stock deteriorated in many urban locations, including northern industrial cities that lost manufacturing jobs, and domestic petroleum centers like New Orleans that lost jobs in the oil industry (Baxter 1997; Grant 1995; Harrison and Bluestone 1988).

Changes in social and economic variables operate through the system of housing suppliers and market intermediaries to affect decisions that change a neighborhood. Many scholars have argued that racial discrimination is institutionalized in housing markets (Cook 1988; Galster 1990; Galster and Hill 1992; Squires 1994). Under discriminatory conditions, rapid change in the racial composition of neighborhoods can transcend income change as a cause of neighborhood decline. Financial intermediaries may restrict lending, which drives down housing prices before poorer in-migrants drive down incomes. The early stages of neighborhood decline may cause panic among investors and homeowners who sell out at low prices to block busting real estate agents, thus accelerating the process of succession (Megbolugbe, Hoek-Smit, and Linneman 1996). At some point in the transition, a “tipping point” may be reached where greater than expected out-migration occurs because in-mover minorities are perceived to be undesirable neighbors. Border models of neighborhood succession propose that housing values may decline in neighborhoods adjacent to those undergoing racial transition due to perceptions that residence in integrated areas is undesirable (Denton and Massey 1991; Galster 1991). The bottom line is that most blacks live in highly segregated neighborhoods with high levels of poverty concentration, so any exogenous factors that increase poverty will geographically increase the concentration of poverty among blacks living in segregated neighborhoods (Massey

and Denton 1993, 122-26). This line of reasoning suggests a second hypothesis.

Hypothesis 2:

Prior racial composition of block groups has a significant effect on subsequent patterns of racial composition, net of the effects of economic variables.

Alternatives to the determinism of ecological and institutional theories stress social choice in residential location and neighborhood change. Social choice theories argue that, in addition to economic considerations, family lifestyles, values, and social status motivate residential location. The choice of a home often rests on preferences for a homogeneous social or cultural environment. Many scholars have found that a majority of blacks prefer to live in fully integrated neighborhoods, while most whites prefer to live in neighborhoods in which their race is numerically dominant (Clark 1991; Farley et al. 1978). Recent work by Reynolds Farley and his colleagues (1994) on racial segregation in Detroit, Michigan supports both George Galster's (1990) and Massey and Denton's (1993) speculation that whites who endorse negative racial stereotypes about blacks are more uncomfortable with black neighbors and are more likely to move away from mixed neighborhoods. Farley et al. (1994) go on to argue that these negative stereotypes are shared by many white financial professionals, home buyers and sellers, and therefore provide a link between institutional and social choice explanations of segregation and racial transition.

The Relationship of Housing Foreclosure and Neighborhood Change

Literature is scarce on the effects of housing foreclosure on the socio-economic characteristics of neighborhoods and the spatial structure of the city. Some research in economics has identified higher mortgage default risk and higher default rates when substantial economic boom is followed by a sharp downturn. Resultant declines in housing prices can create situations where borrowers, suddenly thrown out of work, owe more money on their homes than the home is worth on the open market. Case and Shiller (1996) report that uneven patterns of decline in housing prices in Boston and Los Angeles counties in the late 1980s were associated with higher mortgage default rates among certain clusters of properties. Lawrence Jones (1993) argues that higher default rates will cluster among properties occupied by more affluent people because they will abandon property with negative equity to foreclosure quicker than will poorer people.

Institutional theories of neighborhood succession suggest that a significant relationship exists between racial discrimination, mortgage default, and neighborhood change. Massey and Denton (1993, 131) argue that if housing prices decline because of investor panic or discrimination related to recent increases in black population, mortgage default and abandonment are likely to increase. They believe that a very small number of abandoned homes signal great decay in a neighborhood, and the same may be true of foreclosures in neighborhoods already experiencing racial transition.

Hypothesis 3:

Block groups with a higher proportion of units foreclosed will have both a significantly larger proportion of Blacks and a significantly larger increase in Black population from 1980 to 1990 than block groups with a lower proportion of units foreclosed.

Research indicates that lenders are most apprehensive about neighborhood instability, and recently integrated neighborhoods tend to receive the least credit (Massey and Denton 1993, 107). Any economic downturn or increase in vacancies increases fear of mortgage default, which may restrict loan terms and force buyers into new areas, thus increasing the proportion of renters and further weakening neighborhood stability (Grigsby et al, 51-52). High foreclosure rates will hasten the process of racial transition in these neighborhoods.

Given the socio-spatial segregation pattern of U.S. cities, it is also reasonable to speculate that if a city experiences a specific economic stimulus that increases foreclosures, affected mortgagors will have particular socio-economic characteristics, and foreclosures will cluster in particular neighborhoods.

Hypothesis 4:

The sectoral nature of economic change in New Orleans means that the initial impact of housing foreclosure is to hasten the racial transition of middle to upper income block groups more than lower income ones.

The logic here is that declines in oil and gas and manufacturing employment in New Orleans in the 1980s increased unemployment and decreased owner-occupied housing prices in middle class neighborhoods occupied primarily by whites employed in these relatively high paying jobs.

DATA, VARIABLES, AND METHODS

Data and Variables

A panel data set was constructed at the block group level for New Orleans from the 1980 and 1990 U.S. Census of Population and Housing, Summary Tape Files 3-A (U.S. Census Bureau 1982; 1992). The files primarily contain sample data inflated to represent the total population. Variables constructed at the block group level for 1980 and 1990, along with a variety of measures of change, are discussed in Table 1. The Census data were merged with data on housing foreclosures in New Orleans collected from Civil District Court records. Foreclosure cases were coded from properties sold at judicial foreclosure sales between 1985 and 1990. This time period was chosen to capture the key period before the oil crisis, the period of the crisis, and the start of the recovery. The address of each foreclosed property was geo-coded and the appropriate census block group number was matched to it using Arcview. A wide variety of variables was coded for each foreclosure, but for the purposes of this article, the only variable used is the percentage of properties foreclosed (propfc) in a block group from 1985-90.

TABLE 1**Variables and their Measurement**

Acronym	Variable description	Measurement
hsinc80	median household income in 1980	constant dollars
hsinc90	median household income in 1990	constant dollars
pubinc80 income	proportion of income from public assistance, 1980	public assistance income/total in block group
pubinc90 income	proportion of income from public assistance, 1990	public assistance income/total in block group
meanva80	mean value of owner occupied housing in 1980	constant dollars
meanva90	mean value of owner occupied housing in 1990	constant dollars
propbl80	proportion black in block group in 1980	black population/total population in block group
propbl90	proportion black in block group in 1990	black population/total population in block group
ageunit	median age of structure	1997 - median date unit constructed
mencom80 category	mean commute time for employed people who work away from home in 1980	mid-point of each category of commute time X number of people in the category; then summed totals and divided by total number of employed people
numhsld80	number of households in block group, 1980	

Table 1 (con't)

Acronym	Variable Description	Measurement
numhsl90	number of households in block group, 1990	
vac80	proportion of vacant housing units (all categories) in block group, 1980	total vacant units/total units in block group in 1980
vac90	proportion of vacant housing units (all categories) in block group, 1990	total vacant units/total units in block group in 1990
owned80	proportion of owner occupied units in 1980	total owner occupied units/total units in block group, 1980
owned90	proportion of owner occupied units in 1990	total owner occupied units/total units in block group, 1990
bl9080 proportion	change in proportion black in the block group from 1980 to 1990	proportion black, 1990 - black, 1980
popchg	population change from 1980-90	number of persons, 1990 - number of persons, 1980
hsl9080	change in number of households from 1980-90	number of households, 1990 - number of households, 1980
inco9080 1990 -	percent change in median household income, 1980-90	median household income, 1990/ median household income, 1980/ median household income, 1980
relco80	relative housing costs in 1980	mean value of owner-occupied housing, 1980/city-wide mean, 1980
chgrelco	change in relative housing costs, 1980-90	relative housing costs in 1990 - relative housing costs in 1980
seroc9080	change in personal service employment, 1980-90	proportion employed in block group, 1990 - proportion employed in 1980

Table 1 (con't)

Acronym	Variable Description	Measurement
agmi9080	change in agriculture + mining employment, group, 1980-90	Proportion employed in block 1990 - proportion employed in 1980
pro9080	change in professional employment, 1980-90	proportion employed in block group, 1990 - proportion employed in 1980
propfc	proportion of units in block group foreclosed, 1985-90	total foreclosures, 1985-90/total units in block group, 1990

A total of 4,320 properties were sold at foreclosure between 1985 and 1990: 27 in 1985; 46 in 1986; 247 in 1987; 1,255 in 1988; 1,506 in 1989; and 1,240 in 1990. An additional 707 foreclosure cases were dismissed (did not go to sale) during this period. Fifty-six of the 4,320 cases (1 percent) had insufficient address information, and another 91 (2 percent) had addresses that we could not geo-code. The final data set contains 4,173 housing foreclosures.[1]

Methods

We take a quantitative approach to neighborhood change. Neighborhoods are considered coterminous with census block groups, so shared demographic and spatial attributes operationally define a neighborhood. Neighborhood change is modeled with a panel design where information is

gathered on the same units at several points in time. A panel design is preferable to a cross sectional design because the explicit focus on change facilitates the analysis of causal relationships among variables (Finkel 1995, 1). For example, we raise questions about the causal priority of economic change and the prior racial distribution of population to explain subsequent racial distribution of population. Panel data make possible tests of the causal priority of these variables. [2]

The choice of an appropriate strategy to model change is among the problems associated with panel data analysis. The analysis reported below uses a conditional change model which includes lagged values of the dependent variable. This means that $Y(t)$ (% black in block group, 1990) is predicted from an earlier value $Y(t-1)$ (% black in block group, 1980), along with several independent variables.[3] The conditional change model was chosen instead of an unconditional change, or first differenced model, because it was hypothesized that prior values of the dependent variable were causally related to the dependent variable (Allison 1990; Beck and Katz 1996; Finkel 1995, 6; Markus 1979, 48). In some models reported below, the dependent variable is change in percent black population, 1980-90. In those cases, the lag variable is also included on the right hand side of the regression equation.

The inclusion of a lagged value of the dependent variable increases the likelihood of autocorrelated errors in regression analysis. Errors are autocorrelated when there is a significant correlation between the error of a variable measured at time (t) and the error of the same variable measured at time (t-1) (Greene 1990, 431). The presence of autocorrelation in panel models with a lagged dependent variable tends to produce biased and inconsistent parameter estimates with Ordinary Least Squares (OLS) estimation (Greene 1990, 435; Hanushek and Jackson 1977, 172).

Autocorrelation in the models reported below was corrected with an Estimated Generalized Least Squares (EGLS) procedure that calculates a matrix weighted average of OLS residuals before estimating the final parameters of the equation.[4]

ECONOMIC CHANGE AND RACIAL TRANSITION IN NEW ORLEANS

Changes in the Metro New Orleans Economy

The New Orleans MSA is ideal for the study of economic restructuring caused by the impact of global changes on a region dominated by oil and gas extraction. Mining accounted for 3.8 percent and manufacturing only 8.8 percent of total New Orleans MSA wage and salary employment in 1985, compared to 1 percent employed in mining and 19.9 percent employed in manufacturing nationwide (Ryan 1985). Global petroleum politics and fluctuations in oil and gas prices generated boom (1973-81), bust (1985-87), and recovery (1993-present) cycles that rippled through the local economy. Major oil companies closed regional offices in New Orleans during the 1980s and laid off thousands of employees (see Table 2). Consequently, previous centers of high wage employment in mining, manufacturing, and construction all declined significantly. A net out-migration of 65,000 people reduced New Orleans MSA population from 1.35 million in 1985 to 1.28 million in 1990. MSA population increased to 1.32 million in 1995, while the population of the city of New Orleans declined by 15 percent from 568,000 in 1980 to 482,290 in 1995 (Maruggi 1997).

TABLE 2**Shifts in New Orleans Area Employment Indicators, 1976-1995**

Sector	1976	1980	1985	1990	1995	% Change 1980-90
Mining	17,900	22,800	23,400	17,700	13,800	-22
Construction	34,000	31,500	43,900	25,300	27,500	-20
Manufacturing	63,000	66,600	50,600	49,000	47,400	-26
Trans, Comm, Utilities	47,900	58,500	48,500	46,700	42,300	-20
Trade	119,500	134,200	142,800	136,300	148,300	2
Finance, Ins, Real Estate	27,300	31,100	33,600	32,200	30,200	4
Services	94,800	117,100	135,200	154,500	186,600	32
Government	74,100	89,000	94,900	94,500	103,600	6
Total Non-Ag Employment	478,500	563,200	560,500	556,200	599,700	1

Source: Maruggi 1997.

Construction and expansion of a world class Convention Center and Aquarium helped alleviate the economic crisis, and the city has experienced a more diversified recovery since 1990. The key sectors of employment diversification are health and tourism (see Table 2). New Orleans MSA unemployment fell from over eleven percent in 1985 to 6.5 percent in 1995 as large numbers of lower paying jobs in tourism and retail trade replaced lost employment related to oil and gas extraction, and as workers left the area or dropped out of the labor force.

Changes in Income and Racial Composition In New Orleans

Economic restructuring decreased mining and manufacturing employment of New Orleans residents and increased employment in the service sector, much like the pattern reported for the entire MSA. While growth of health and professional services brought many high wage jobs to the city, the net effect of economic restructuring in the 1980s was a \$1,502 (8.3 percent) **decrease** in real median household income, and an increase from 13 percent to 15 percent of aggregate household income derived from public assistance (See Table 3). Recessionary economic conditions were also associated with a real decrease of \$5,777 (11.4 percent) in the mean value of owner occupied housing in the city, and an increase from 11 percent to 17 percent of all types of housing units left vacant. Add in the failure of a half dozen local savings and loan institutions, a crack cocaine epidemic with attendant increases in homicide, and the economic shocks of the 1980s clearly brought the conditions for high rates of housing foreclosure, increased concentration of poverty, and significant decline in many New Orleans neighborhoods.

TABLE 3**Means and Standard Deviations of Variables in the Analysis**

Variable	1980 (N=653) Mean (SD)	1990 (N=657) Mean (SD)	Change (SD)
Median Household Income(a)	\$18,069 (10,270)	\$16,567 (12,226)	\$-1,502 (7,116)
Median Age of Structure	---	46 (14.87)	---
Mean Value of Owner-occupied Housing(a)	\$50,464 (40,231)	\$44,687 (37,871)	\$-5,777 (22,326)
Median Gross Rent (a)	\$ 260 (102)	\$ 296 (118)	\$ 36
% black population	53.1 (37)	59.6 (37)	6.5 (17)
% Owner-occupied Housing	37 (29)	41 (26)	4 (17)
% Vacant Units	11 (14)	17 (12)	6
Number of Households	312 (194)	286 (220)	-26 (182)
Population of Block Group	849 (608)	756 (672)	-93 (384)
% Income from Public Assistance	13 (12)	15 (14)	2
% Units Foreclosed '85-90	---	1.8 (1.7)	
Mean Commute (minutes)	24.5 (7.1)	25.32 (8.27)	1

(a) constant dollars (1982-84=100).

The choice of 1980 to 1990 as the period to examine change in the racial composition of New Orleans neighborhoods may truncate the analysis and obscure the effects of an ongoing process of change. The black population of New Orleans increased from 37 percent in 1960 to 45 percent in 1970, before reaching 53 percent in 1980 and 60 percent in 1990 (U. S. Bureau of Census 1972; see Table 3). A net out-migration of over 60,000 whites combined with a nearly stable black population accounts for the increase in the proportion of blacks in New Orleans between 1980 and 1990. This suggests that, contrary to the claims of Ottensmann (1995) and other critics of the “racial tipping” hypothesis, changes in the racial composition of block groups in New Orleans were **not** related to the in-migration of blacks, but to the migration of whites out of the city. This is consistent with the prediction of Spain (1979) that in the 1970s New Orleans began a rapid process of racial succession that replaced two centuries of racial residential proximity with a pattern of racial segregation more typical of other large cities in the country.

The steady (.8 percent per year) increase in black percentage of the population over a thirty year period raises the question of whether ongoing racial transition preceded changes in real income reported for New Orleans block groups between 1980 and 1990. A cross-lagged EGLS regression analysis was performed to untangle the causal priority of race and median household income in the process of neighborhood change (see Table 4). Results indicate that change in percent black in a block group from 1980 to 1990 was prior to changes in median household income during the same period. Percent black in the block group in 1980 has a significant negative effect on median household income in 1990, with the effect of median household income in 1980 statistically controlled. The larger the percent black population in a block group in 1980, the smaller the median household income in that block group in 1990.

TABLE 4

**CROSS-LAGGED EGLS REGRESSION OF MEAN INCOME AND RACIAL
COMPOSITION OF NEW ORLEANS BLOCK GROUPS, 1980-90**

	Dep. Variable % Black, 1990	Dep. Variable Income, 1990
Independent Var.	b (t-ratio)	b (t-ratio)
Intercept	.167** (6.52)	6158.2** (5.81)
%Black 80	.842** (36.46)	-7010.3** (-7.40)
Income 80	-.000001 (-1.16)	.79** (22.84)
R ²	.841	.686
N	635	635

See table 1 for description of variables.
** p<.01

Household income in 1980, however, is **not** a significant predictor of percent black in a block group in 1990, with percent black in 1980 controlled. It appears that the size of the prior black population, rather than income levels, best predicts the subsequent proportion of blacks in a block group. What happened was that whites migrated out of integrated neighborhoods and were

replaced by poorer blacks. This is consistent with the conclusion that whites will move out of neighborhoods if they fear being outnumbered by blacks (Clark 1991; Denton and Massey 1991).

Consistent with the above findings, change in percent black in a block group is significantly and positively correlated with median household income in 1980 ($r=.16$, $p<.01$, see Appendix I), while the correlation of change in percent black in a block group with median income in 1990 is essentially zero ($r=-.002$). Change in black population during the 1980s occurred in block groups that declined in median income between 1980 and 1990. This is consistent with predictions of both ecological and institutional theories that the continued influx of poorer black residents drives down median income in affected block groups (Grigsby et al. 1987; Massey and Denton 1993). These results point toward an ongoing process of white flight from the city as a primary impetus for the increased concentration of poverty among poorer black residents who remained.

CORRELATIONAL ANALYSIS OF NEIGHBORHOOD CHANGE IN NEW ORLEANS

Vacancy rates are important indicators of abandonment and out-migration from a neighborhood. Significant changes in the spatial pattern of vacancy in New Orleans block groups are revealed by the low correlation ($r=.10$) between vacancy rates in 1980 and 1990. Further examination of changes in vacancy rates is revealing. The vacancy rate in 1980 is negatively correlated with percent black in the block group in both 1980 ($r=-.12$) and 1990 ($r=-.12$), which

suggests that vacancies were slightly more prevalent in block groups with a lower proportion of black residents. However, the vacancy rate in 1990 is significantly and positively correlated with percent black in the block group in both 1980 ($r=.34$) and 1990 ($r=.32$), which suggests that vacancy rates not only increased in 1990, but that they had also shifted to predominantly black neighborhoods. Higher vacancy rates in both 1980 and 1990 are also associated with less affluent block groups, but the correlations are larger for 1990 than 1980. To summarize, vacancy rates increased in lower income, predominantly black block groups that experienced an out-migration of whites between 1980 and 1990. This provides additional support for the proposition that white flight was a major cause of neighborhood instability.

The change from a negative and insignificant correlation of foreclosure and vacancy rate in 1980 ($r=-.07$), to a significant and positive correlation in 1990 ($r=.17$, $p < .01$) associates foreclosures with higher vacancy rates in predominantly black neighborhoods. This is consistent with the specification of Massey and Denton's (1993, 130-31) scenario in hypothesis three that abandonment and out-migration combine with housing foreclosure to intensify racial transition and neighborhood decline.

Significantly higher foreclosure rates are associated with block groups with a larger percentage of blacks in the block group ($r^{80} = .30$, $p < .01$; $r^{90} = .36$, $p < .01$, see Appendix I). The association of foreclosures with lower income black block groups contradicts the prediction in hypothesis four that foreclosures were concentrated in middle to upper income block groups inhabited by whites who fled the city during the oil crisis. While these results point to the existence of an ongoing process of racial transition in New Orleans, the fact that the petroleum industry either laid off or transferred to Houston thousands of white geologists and middle

managers clearly accelerated racial transition. A clearer picture of the process awaits the multivariate analysis of housing foreclosure and racial transition.

MULTIVARIATE ANALYSIS OF FORECLOSURE AND RACIAL TRANSITION

A baseline EGLS regression model was estimated for racial composition of New Orleans block groups. Consistent with the correlational analysis, percent black in the block group in 1980 is the strongest predictor of percent black in 1990 (see Table 5, model 1). Block groups with a larger percentage of black residents in 1980 have a significantly larger black population in 1990. Median household income in 1980 is not a significant predictor of percent black population in 1990.[5] However, block groups with larger increases in median income have significantly smaller changes in percent black population than block groups with smaller changes in income, and vice-versa. This suggests that more affluent block groups did not increase their black population from 1980 to 1990 while less affluent ones did. This finding reinforces the argument that the economic shocks of the mid-1980s intensified pre-existing patterns of racial transition, possibly through their effects on housing prices and foreclosure rates.

Housing foreclosure has a significant and positive effect on the proportion of black residents in New Orleans block groups, net of the effects of other variables in the model. The higher the percentage of units foreclosed in the block group, the larger the percent black population in 1990. More specifically, a 1.0 percent increase in foreclosures in a block group is associated with a 1.3 percent larger black population in 1990.

TABLE 5**EGLS REGRESSION OF RACIAL COMPOSITION OF NEW ORLEANS BLOCK GROUPS ON PREDICTORS OF NEIGHBORHOOD CHANGE (a)**

Variable	Model 1	Model 2
	b (t-ratio)	b (t-ratio)
Constant	.160** (3.41)	.146** (3.17)
Proportion Black, 1980	.750** (33.55)	.795** (31.02)
Median Age of Unit, 1980	-.002** (-3.06)	-.001** (-2.87)
Median Household Income, 1980	-9.05E-7 (-.970)	-7.45E-7 (-.836)
Change in Median Household Income, 1980-1990	-.074** (-5.65)	-.055** (-4.31)
Relative Cost of Owner-occupied Housing, 1980	-.032** (-2.95)	-.031** (-2.94)
Change in Number of Households, 1980-1990	.00008 (1.88)	.00008 (1.92)
Proportion of Foreclosures	1.274** (3.66)	2.777** (4.24)
Mean Commute Time, 1980	.006** (5.03)	.005** (4.76)
Proportion Black, 1980 X Proportion Foreclosed		-2.72** (-3.14)
Change in Professional Employment, 1980-90		-.268** (-5.34)
Change in Personal Service Employment, 1980-90		.162** (3.73)
Change in Agriculture and Mining Employment, 1980-90		-.257* (-2.21)
R ²	.864	.876
N	636	636

(a) See text for data sources, table 1 for description of variables.

* p<.05; ** p<.01

As predicted by hypothesis one and most research on poverty, lower relative housing costs in a block group are associated with a significantly larger black population. Mean commute time is also a significant predictor of a larger black population. The longer the mean commute time for people who work outside the home, the larger the percent black population in the block group. This is probably a consequence of the slower commute time of blacks, more of whom ride public transportation to work. The direction of the relationship between mean age of housing stock and percent black in the block group contradicts predictions of neighborhood succession theories summarized in hypothesis one. The older the average unit the smaller the percent black in the block group[6]. This may be due to a strong movement for historic preservation in many older neighborhoods, and to the large concentration of blacks and the significant racial transition in Eastern New Orleans, which was developed after World War II and grew in the 1960s and 1970s as an integrated middle class suburb. Much of the decline in white population during the 1980s was from block groups in New Orleans East (Spain 1979). At the same time, change in the number of households is not a significant predictor of black population in 1990. This suggests that the increase in the concentration of blacks was not only due to an out-migration of whites, but also a concomitant intra-urban migration of blacks into block groups abandoned by whites.

In an effort to specify the effects of economic shocks on racial transition, the baseline model was elaborated with the addition of variables that measure change from 1980 to 1990 in the percent of total block group employment in agriculture and mining, management and professions, and personal services. The statistical interaction was also investigated between percent black in a block group in 1980 and percent of housing units foreclosed from 1985 to 1990, as it affects black population in 1990.[7] Results in the baseline model did not change much with the addition of these variables. The same determinants of neighborhood change

remain significant, with a slightly stronger positive effect of housing foreclosure on percent black in the block group.

Changes in block group employment have effects on black population similar to those predicted by many scholars (e.g., Wilson 1987). Larger changes in professional and managerial employment are associated with a significantly smaller percentage of blacks in a block group. This is because most managerial and professional employees are white and live in predominantly white neighborhoods. The same is true of changes in agricultural and mining employment. Declines in employment in these sectors were concentrated in upper income white neighborhoods, so change in the percent employed in mining is associated with block groups with smaller black populations. Also as expected, larger changes in personal service employment have a significant positive effect on the percent black in a block group in 1990. This is related to the high concentration of blacks in lower paid personal service jobs like maid and gardener.

The interaction of housing foreclosure and percent black in the block group in 1980 has a significant negative effect on percent black in the block group in 1990. This indicates a nonlinear relationship where housing foreclosures have a different effect on the percent black population in 1990 in block groups with a smaller black population in 1980 than in block groups with a larger black population in 1980. A possible scenario to account for this finding is that the negative effects of economic recession on housing prices were compounded in integrated neighborhoods by a fear of racial transition that increased foreclosure rates when some whites who were laid off or transferred by oil companies abandoned their mortgages and left the city.

The nonlinear relationship between housing foreclosure and racial transition was investigated further with the estimation of OLS regression models for block groups with

different percentages of black population and different median household incomes in 1980 (see Table 6).

TABLE 6

SUMMARY OF OLS REGRESSIONS OF CHANGE IN PERCENT BLACK POPULATION IN NEW ORLEANS BLOCK GROUPS FROM 1980-90 ON FORECLOSURE RATES FOR VARIOUS CATEGORIES OF INCOME AND RACIAL COMPOSITION, CONTROLLING FOR INDICATORS OF NEIGHBORHOOD CHANGE (a)

Race and Income Category of % foreclosure	beta and (t-ratio)	% foreclosure, 1985-90
1. % Black, 1980 = 0 (N=56)	1.34 (.949)	.006
2. % Black, 1980 < .150 (N=153)	3.28** (3.97)	.007
3. % Black, 1980 > .93 (N=171)	.012 (.033)	.022
4. % Black, 1980 < .150 and change in % Black > 0 (N=89)	3.76** (3.49)	.010
5. income 1980 < 7798 (N=57)	.821 (.482)	.017
6. income 1980 < 18068 (mean, N=400)	1.20** (2.72)	.020
7. income 1980 >28338 (N=80)	4.37** (3.85)	.014
8. income 1980 >28338 and % Black, 1980 = 0 (N=25)	1.36 (.778)	.008

(a) Unreported predictors of neighborhood change are same variables listed in Table 5, Model 1.

* p<.05; ** p<.01

The idea here is to figure out how foreclosure affected block groups that were already experiencing racial transition when hit by the economic shock of lower oil prices. Percent black in the block group in 1980 was divided into three non-discrete categories: (1) zero percent black (n=56); (2) more than one standard deviation below the mean percent black for the city (<.15 black, n=153); and (3) more than one standard deviation above the mean percent black for the city (>.93 black, n=171). The dependent variable is change in percent black in the block group, which is regressed on all the predictor variables in Table 5, Model 1. For clarity of exposition, percent of housing units foreclosed and the regression coefficients for foreclosure rate are the only statistics presented in Table 6.

Results of these regressions reinforce the conclusion that a nonlinear relationship exists between housing foreclosure and racial transition. Percent foreclosure is not a significant predictor of percent black population in 1990 in block groups that either had no blacks in 1980 (Model 1, $p=.949$), or where the block group was more than 93 percent black in 1980 (Model 3, $p=-.033$). Foreclosure rates were low (.006), and income was high (\$12,000 above the city-wide mean) and increasing in the all white block groups, hardly the conditions for either foreclosure or racial transition.

Foreclosure rate is a significant predictor of black population in a block group in 1990 when the black population in 1980 was low, and especially when it was low but increasing (see Table 6, Models 2 and 4). It appears that housing foreclosure increased the percent black population in neighborhoods that were already beginning to experience racial transition. Higher income whites who departed these neighborhoods were replaced by lower income blacks, and housing foreclosure played a significant role in the process. Let us now briefly turn to the effects of foreclosure on racial transition in more and less affluent neighborhoods.

Foreclosure is not a significant predictor of change in the black population of the poorest block groups in the city (see Table 6, Model 5, $p=.482$), or in upper income block groups without any black population in 1980 (see Table 6, Model 8, $p=.778$). Foreclosure is an important predictor of racial transition in block groups above the lowest income level where there was a pre-existing black population. The substantive interpretation of this finding is that significant numbers of working and middle class whites living in integrated neighborhoods, particularly in Eastern New Orleans, abandoned to foreclosure homes with lower market values than mortgage balances when their jobs were affected by the oil crisis. They were replaced in these neighborhoods by poorer black residents.

DISCUSSION AND CONCLUSION

Massey and Denton (1993, 220) maintain that the main issue in the study of urban poverty is not whether race or class perpetuates the existence of poverty, but how they interact to produce neighborhood outcomes in particular locations. We investigated whether housing foreclosure is one mechanism that may help untangle the interaction of race and class in the process of neighborhood change. Empirical results are consistent with the argument that housing foreclosure intensified an ongoing white exodus from neighborhoods with relatively small black populations when a severe economic downturn negatively affected housing prices. It is plausible to argue that economic downturn catalyzed latent preferences of some whites to leave a neighborhood that was already in transition.

Housing foreclosure and various forms of vacancy were significant components of population decline, racial transition, and neighborhood change in New Orleans during the 1980s. Economic shocks reduced home values and that may well have interacted with negative racial stereotypes about the perceived effects of further integration on home values to catalyze the relocation decisions of some white residents. Recession in the core of the local economy reduced housing prices and opened up declining middle class suburbs (Eastern New Orleans) to poorer people who, in New Orleans, were also black. Negative racial stereotypes were incited and a segregated housing market existed to intensify racial transition and the concentration of poverty (Massey and Denton 1993, 220). The process of racial transition in New Orleans was ongoing, what we show is that when a severe economic downturn accelerated oil industry restructuring, employment and housing prices dropped and housing foreclosure became a significant independent accelerator to the process. This argument is tentative, for it remains unclear the extent to which a foreclosure strategy developed among lenders or distressed white home owners, and whether such a strategy hastened “racial tipping” of certain neighborhoods. However, it is clear that housing foreclosures did contribute to the process of racial transition in the city.

The argument developed here is complicated by difficulties in the analysis of change, and the complex interactions of race, income, housing costs, and foreclosure rates. Strategies for future research should include structural equation modeling of the causal processes investigated in this article. How do exogenous economic shocks affect housing prices, income, and foreclosure rates as they all influence racial transition? It also remains to be investigated whether foreclosures primarily affected vacancy rates of rental property or among resident homeowners

hurt by the economic downturn. Another future research strategy is to extend the study of housing foreclosure and neighborhood change to additional cities. It is very likely that foreclosure has different effects on neighborhood transition in cities with different types of economic stimulus, different local housing markets, and different racial attitudes and racial distributions of population. A comparison of New Orleans with a northern industrial city that experienced economic decline and a southern city that prospered in the 1980s would further clarify the role of housing foreclosure in the process of neighborhood change.

The theoretical contribution of this study can also be expanded. Foreclosure and abandonment may well be central mechanisms that link changes in the macro economy, housing finance, and racial stereotypes with the neighborhood succession process. However, micro level analysis of lender, homeowner, and landlord decision making are also required to cement the links between macro economics, housing foreclosure, and neighborhood change. It is our hope that this article will stimulate future research on these very important questions.

NOTES

[1] The 147 missing foreclosure cases are not statistically different (Student's t-test, $p < .01$, two-tailed) from the spatially matched cases on five important attributes (loan amount, interest rate, monthly payment, outstanding balance, and appraised value). Since some cases could not be spatially matched, there is no way to definitively evaluate the extent of spatial bias. For the purposes of this analysis, we assume no systematic spatial bias in these data.

[2] The analysis reported below includes a Granger test of causal order, which is a cross lagged regression of two or more variables measured at two or more points in time. A variable is said to "Granger cause" another if any value of the first variable measured at times $(t-1)$, $(t-2)$, etc. has a significant effect on the second variable measured at time (t) , controlling for all prior values of the second variable (Finkel 1995, 25-6; Markus 1979).

[3] The conditional change model can be expressed as follows:

$$Y_t = B_0 + B_1 X(t) + B_2 Y(t-1) + e ; \quad (1)$$

The unconditional change model with a lag value of the dependent variable can be expressed as follows:

$$\text{Change } Y = B_0 + B_1 X(t-1) + (B_2 - 1)Y(t-1) + e . \quad (2)$$

In equation (2), the effect of $Y(t-1)$ on Change in Y can be viewed as the stability effect of $Y(t-1)$ on Y_t in equation (1), minus one (Finkel 1995, 7).

[4] The generalized least squares procedure used in this analysis uses OLS residuals to estimate the covariances of errors across observations. The first observation is used to find a constant or starting value for the weighting process. This technique is widely used to correct for a first order autocorrelation process (Greene 1990, 440; Judge et al. 1985; SAS 1993, 217).

[5] The high correlation between household income and relative housing costs in a block group in 1980 ($r=.70$) creates a collinearity problem that confounds the analysis of household income and percent black, 1990, when relative housing costs is included in the model. Much neighborhood succession literature suggests that income filters households into housing sub-markets, so it was decided that relative housing costs and changes in income were the most relevant processes modeled, and the collinearity of income and relative housing costs must be tolerated.

[6] Mean age of occupied housing unit can be a misleading variable in the analysis of neighborhood change in an older city like New Orleans. The oldest house coded in the Census of Population and Housing was constructed in 1939, a relatively new house by New Orleans standards.

[7] Examination of scatterplots from the regression of percent black population on housing foreclosures in a block group revealed an abnormal distribution of errors, which suggested the possibility of a nonlinear relationship. Tests for interaction effects were then performed.

APPENDIX I

CORRELATIONS OF VARIABLES IN THE ANALYSIS

Variable (a)	1	2	3	4	5	6	7	8	9	10
1. Propbl90										
2. Propbl80	.898									
3. Bl9080	.178	-.273								
4. Hsinc80	-.549	-.600	.159							
5. Hsinc90	-.546	-.533	-.002	.808						
6. Inco9080	-.280	-.198	-.171	-.024	.466					
7. Propfc	.356	.299	.109	-.131	-.096	-.005				
8. Ageunit	.094	.164	-.161	-.269	-.011	.017	.005			
9. Hsld9080	-.068	-.141	.167	.304	.158	-.036	.128	-.279		
10. Mencom80	.491	.502	.043	-.310	-.166	-.179	.230	.207	-.078	
11. Pro9080	-.238	-.140	-.206	.089	.161	.142	-.141	.025	.036	-.107
12. Seroc9080	.095	-.003	.214	-.034	-.092	-.167	.046	.023	-.004	.009
13. Agmi9080	-.022	.025	-.105	-.117	-.059	.075	-.049	.091	-.059	-.038
14. Relco80	-.519	-.509	.006	.705	.747	.168	-.186	.081	.163	-.149
15. Chgrelco	.067	.065	.001	-.115	-.086	.004	.019	.086	-.059	-.015
16. Vac90	.318	.341	-.067	-.474	-.305	.066	.174	.309	-.188	.188
17. Vac80	-.116	-.118	.010	-.295	-.210	.129	-.072	-.266	.054	-.401
18. Meanva90	-.465	-.442	-.028	.653	.763	.237	-.173	.125	.101	-.135
19. Meanva80	-.519	-.509	.006	.705	.747	.168	-.186	.081	.163	-.149

(a) See Table 1 for a description of variables.

APPENDIX I (Con't)

CORRELATION MATRIX OF VARIABLES IN THE ANALYSIS

	11	12	13	14	15	16	17	18
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.	-.131							
13.	.022	-.002						
14.	.108	-.055	-.083					
15.	-.040	.015	.025	-.182				
16.	-.128	.013	.060	-.298	.224			
17.	-.006	.019	.073	-.240	.089	-.626		
18.	.118	-.045	-.050	.838	-.013	-.244	-.221	
19.	.108	-.055	-.083	1.00	-.182	-.298	-.240	.838

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