

Thesis Workshop
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**“Racial Residential Segregation and Interracial Economic Disparities”
Revisited**

Abstract:

Housing segregation and economic disparities between races continue to be urgent issues in the United States in spite of other progress made in the area of racial inequality. Housing segregation has been demonstrated again and again, in studies both old and new, to be related to a series of adverse conditions for minority communities. Individuals in segregated black neighborhoods, for instance, are more likely to be poor, to be unhealthy, and to be under-educated. These outcomes are not accidents and are not inevitable. This paper seeks to understand the causes and effects of residential segregation and particularly its relationship to economic inequities. In 1987, George Galster published an article entitled "Residential Segregation and Interracial Economic Disparities." This paper, written nearly three decades ago, sought to understand these same issues. Dr. Galster developed a statistical technique to shed light on the mechanics of these disparities. He measured the effects of residential and occupational discrimination; white self-segregation; and job and housing market characteristics on residential segregation and economic disparities. With only slight alterations that are described in detail later on, this thesis replicates the methodology described in Galster's 1987 paper with the most recent available data. The hypothesis presented is that in spite of objective social progress in race relations in other areas, the dynamics of residential segregation and economic disparities have remained more or less unchanged. The numbers do not bear this out, however. Instead, an important transformation appears to have taken place. Having been unable to rule out the null hypothesis, the implications are less clear and objective than could be hoped. Nevertheless, the

migration of whites back into urban areas in recent years and the effects of gentrification may help explain some of the deviation from the predicted values.

Introduction:

Racial residential segregation is among the most insidious of attributes of modern American cities. A product of racism and discrimination, self-segregation, history, poverty, inequitable distribution of jobs and services, and any number of other causes, residential segregation is perhaps the most obvious indicator that racial justice is far from attained in the twenty-first century.

Though most indicators show that segregation has decreased over the past decades, other evidence contradicts that finding. Recent studies suggest that school segregation (which itself can be a measure of residential segregation since most students attend local schools) is in fact increasing.¹

While residential segregation may be perceived to have benefits to some residents, it is emblematic of a system that is fundamentally 'separate and unequal.'² Even though many might choose to live in segregated neighborhoods as a matter of personal preference, numerous studies have demonstrated clearly that segregated, predominately black neighborhoods put their residents at considerable risk when it

1 "Segregation Now: The Resegregation of America's Schools." ProPublica. N.p., 16

2 Thompson, D. (2007). Kerner commission. In D. Goldfield (Ed.), *Encyclopedia of American Urban history*. (pp. 415-417). Thousand Oaks, CA: SAGE Publications, Inc. doi: <http://dx.doi.org/10.4135/9781412952620.n235>

comes to economic and educational opportunities,³ health and mortality outcomes,⁴ and are correlated with a number of other adverse affects.

The issue of residential segregation, while rarely discussed as such in popular media, is the essential context for the most notable events in 2015, specifically the spat of murders of unarmed black men and boys by white police officers, and the emergence of 'Black Lives Matter.' These narratives emphasize the fact that different racial groups live in 'parallel worlds' in the United States and that racial inequity persists.

The issue of racial residential segregation is particularly salient now because of the 'reverse white flight' ('Seinfeld effect'⁵) process occurring in our cities whereby black neighborhoods are gentrified by white newcomers.⁶ This fact raised the question: have the dynamics of racial residential segregation stayed constant, or has the re-urbanization of America, combined with social progress with regard to racial issues, fundamentally transformed the way segregation works in the metropolitan United States?

3 Kawachi I. Income inequality and economic residential segregation: The relation between income inequality and economic residential segregation is undoubtedly causal. (Income Inequality). *Journal of epidemiology and community health* (1979). 2002-03-01;56:165.

4 Acevedo-Garcia, Dolores et al. "Future Directions in Residential Segregation and Health Research: A Multilevel Approach." *American Journal of Public Health* 93.2 (2003): 215–221. Print.

5 Piiparinen, Richy. "Gentrification as an End-Game and the Rise of "Sub-Urbanity"" *New Geography*

6 Roberts, Sam. "'White Flight' Has Reversed, Census Finds." *The New York Times*. *The New York Times*, 22 Sept. 2008. Web. 16 Dec. 2015.

Literature Review:

There are a number of quantitative models that tackle the dynamics of racial residential segregation. None would be complete, however, without briefly acknowledging the obvious historical context in which racial segregation, and even the very idea of race, exist. That context includes a series of segregatory policies and social attitudes that range in their degree of explicitness, but together have divided our cities. Slavery, Jim Crow laws, racist local ordinances, restrictive covenants, redlining, discriminatory landlords and neighbors, etc. have all, over time, contributed to the segregated condition that exists today. Though housing discrimination is formally illegal in the US and much social progress has been made, we know that it endures.

There are several measures for residential racial segregation. A dissimilarity index compares a smaller jurisdiction (e.g. a neighborhood) to a larger one (a city). This index, which ranges from 0 to 1, shows the extent to which the smaller unit is dissimilar to its context in terms of the numeric distribution of racial groups. Conceptually, it is a measure of what proportion of people of a particular racial group that would have to move in order to achieve a jurisdiction that perfectly mimics its larger context⁷. The way that segregation is measured is sensitive to scale. For instance while segregation within jurisdictions has declined since the

⁷ Boustan, Leah Platt. "Racial Residential Segregation in American Cities." (2013)

sixties, segregation between jurisdictions has increased.⁸ This distinction is significant.

There are a number of factors that the literature suggests are causes of racial residential segregation. Among other things, discrimination, self-segregation, economic inequalities,⁹ and cultural differences are suggested as primary catalysts. This review will consider each cause individually before examining a number of models that purport to show how those factors interact.

Black self-segregation is a primary driver of the uneven distribution of the races in the residential context. Reasons for why this might be are relatively straightforward: blacks may simply prefer to live with other blacks. When presented with a survey that asked respondents to choose their preferred prototypical neighborhood, blacks consistently chose the predominately black neighborhoods over other options.¹⁰ This effect actually increased between the 1970's and the 1990's. It could also be the case that retail and restaurant establishments that tend to cater to particular racial groups over others drive housing decisions and thus perpetuate segregation.¹¹

8 Ibid.

9 Galster, George C. "Residential Segregation and Interracial Economic Disparities: A Simultaneous-equations Approach." *Journal of Urban Economics* 21.1 (1987): 22-44. Web.

10 Leah Platt. "Racial Residential Segregation in American Cities." (2013): n. pag. Web.

11 Waldfogel, Joel. *The tyranny of the market : why you can't always get what you want*. Harvard University Press, 30 Jun 2009.

Collective discrimination on the part of whites against blacks also has the effect of promoting racial residential segregation. Before the passage of the Fair Housing Act in 1968, American landlords were allowed to deny individuals housing on the basis of race. Since then, tactics have changed. In some cases, the Fair Housing Act has been leveraged against itself. The law not only prohibits segregatory housing decisions but also mandates positive action on the part of housing authorities to promote integration. Authorities use Low Income Housing Tax Credits to fulfill their integration mandate, but strategically site developments in such a way as to have a segregatory effect. Racial steering on the part of white real estate agents is also a documented source of segregation.

On a smaller scale, individual discrimination also plays a role in the segregation of American cities and neighborhoods. Like blacks, when tested empirically, whites express a preference for living with other whites, though this result is sensitive to the way it is measured.¹² Schelling used game theory to illustrate that the preference of individuals to live near others of the same racial group would lead to total segregation in a theoretical world.¹³

Economic disparities likewise cause segregation. Of particular concern is that existing segregation interacts with poverty in such a way as to promote social conditions (in the form of unemployment amongst males and single motherhood

12 Carr, James H.. "The Complexity of Segregation: Why It Continues 30 Years After the Enactment of the Fair Housing Act". *Cityscape* 4.3 (1999): 139-146. Web...

13 Hatna, Erez, and Itzhak Benenson. "The Schelling Model of Ethnic Residential Dynamics: Beyond the Integrated - Segregated Dichotomy of Patterns." *JASSS Journal of Artificial Societies and Social Simulation* 15.1 (2012): n. pag. Web.

amongst females) that have the effect of concentrating poverty in black neighborhoods.¹⁴ Zhang employs game theory to update Schelling's model to include the price of housing. This illustrates the way in which race and class interact and produce residential segregation.

As discussed above, while civil rights legislation in the 1960's, including the Fair Housing Act, was designed to promote integration and address racial inequalities, the effect of this legislation could contradict its stated goals. The Fair Housing Act and 'the expansion of civil rights [which] generated new opportunities for middle-class blacks'¹⁵ were successful in creating housing mobility for the black middle-class. But while this itself was an act of integration, the void of a middle-class it created in black neighborhoods led to a hyper-concentration of poverty in those areas. As we know, poverty itself has a segregatory effect. This theory is excerpted from part of a larger argument by William J. Wilson about the rise of the 'minority underclass,' which factors in not only civil rights legislation but also economic and demographic factors. Massey rebuts this idea in part by pointing out that the departure of middle-class blacks from the 'ghettos' in the 1970's was overstated.¹⁶

14 "Redress for historical injustices in the United States: on reparations for slavery, Jim Crow, and their legacies" Michael T. Martin - Marilyn Yaquinto - Duke University Press - 2007

15 William J Wilson quoted in: Massey, Douglas S. "American Apartheid: Segregation and the Making of the Underclass". American Journal of Sociology 96.2 (1990)

16 Massey, Douglas S. "American Apartheid: Segregation and the Making of the Underclass". American Journal of Sociology 96.2 (1990)

Indeed, the bulk of the literature refutes the idea that 1960's era civil rights legislation had a net effect of perpetuating segregation.

Similarly, it is suggested by some commentators that welfare programs, ostensibly created to combat inequality, in fact do the opposite in some regards. The rationale behind this argument is that welfare creates a 'culture of dependency' where perpetually dependent individuals are unwilling or unable to find gainful employment. This perpetuates segregation to the extent that concentrated poverty divides cities along racial lines. This is a controversial theory.

In addition to a long list of adverse correlates, segregation is said to perpetuate itself through a chain of factors. The logic is this: segregation makes neighborhoods susceptible to decline and concentrations of black poverty. This leads to decay, crime and social disorder which together create an 'oppositional culture' that stands in deliberate counterpoint to the mainstream. This distinct culture results in social isolation. Unemployment and poverty naturally follow. Poverty then leads back into segregation.

Each of these conceptual models approach the dynamics of segregation through a particular lens, be it cultural, economic, or discriminatory. And though they often consider feedback loops in terms of the relationship between poverty and segregation, their general structure is that of a vector: an input causes an output. This is the way statistical regressions work. While much valuable information can be derived from this technique it overlooks the bidirectionality of causation. Racial residential segregation is classic 'chicken or egg' problem where causes and effects are deeply engrained with one another and are indifferentiable.

Galster's "Residential Segregation and Interracial Economic Disparities," seeks to address that conceptual issue by establishing a series of models that show not only the causes and effects of segregation, but how the causes and effects cause and affect one another. With this in mind, he tests how self-segregation, discrimination, economic opportunity, the workforce and the labor market are related to residential segregation. In his formulation, residential segregation is a function of i) economic disparities, ii) housing discrimination, and iii) employment location. Economic disparities are a function a i) residential segregation, ii) labor market discrimination, iii) and employment location. I find his model to be extremely compelling and persuasive. For the rest of the thesis I will refer to it, and approximate its methodology, with updates where appropriate.

Hypothesis and Research Questions:

Fundamentally, this thesis asks the question, what are the causes and effects of racial residential segregation? How have those dynamics changed with the reversal of white flight trends in recent years? To examine those questions I use Galster's "Residential Segregation and Interracial Economic Disparities" as a model to measure changes in the dynamics of segregation over the last thirty years.

Though there have been measurable shifts in both demographics and social attitudes over the last thirty years, I argue that Galster's model will continue to be relevant in spite of these changes. With a couple of small exceptions the variables he considers have not been so dramatically transformed as to be rendered moot.

Methodology:

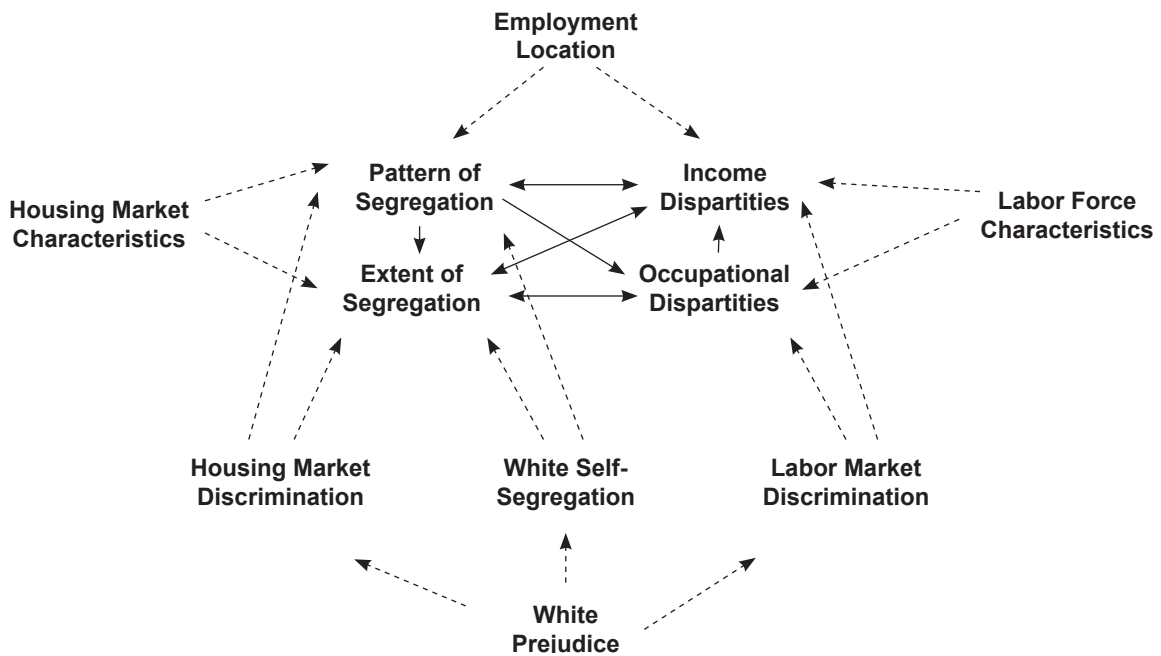
As mentioned above, this thesis uses Galster's 1987 "Residential Segregation and Interracial Economic Disparities" as a point of reference. My methodology therefore is based on the models he devised for that work, with a couple of strategic updates that take into account computing technology and specifically mapping techniques that have been developed recently. This model measures segregation on the level of the Metropolitan Statistical Area, though inputs are collected on a range of scales.

Data has been collected via the American Fact Finder interface for accessing public information collected by the federal government. Demographic data was obtained from the most recent US Census American Community Survey 5 Year product available, in most cases from 2014. Data regarding public school performance was obtained from the National Center for Education Statistics. Discrimination information was borrowed from a dataset collected for "Statistical Discrimination of Prejudice? A Large Sample Field Experiment" published in the "The Review of Economics and Statistics".

There are four regressions which each measure a different dependent variable that constitute this methodology. Two regressions measure the causes of segregation, while the other two measure its economic impacts. Together, these four statistical measures constitute a loop: the dependent variable in each regression is subsequently used as an independent variable in the other regressions. In this way, the model is bidirectional, meaning that, as in real life, no variable exists in isolation

but is rather driven by a network of dynamic inputs. The figure below illustrates the interactions modeled.

Fig. 1



While the lines with arrows at both ends indicate feedback loops of cause and effect, a more comprehensive model would surely find even more interaction between the variables listed.

To summarize, the regressions represent:

1. The distribution of segregation over a MSA (**pattern**) is a function of: i) economic disparities, ii) affordable housing, iii) the change in the black population, and iv) discrimination.

2. The overall exposure of blacks to whites (**extent**) is a function of: i) the pattern of segregation, ii) occupational disparities and income, iii) the extent to which black people can live in predominately white neighborhoods, and iv) discrimination.

3. **Occupational disparities** (the extent to which white and black people work in different fields) are a function of: i. residential segregation, ii) educational disparities, iii) the distribution of jobs relative to underserved areas, iv) overall unemployment, v) the proportion of the workforce in manufacturing, vi) employment discrimination.

4. **Income disparities** are a function of: i) residential segregation, ii) occupational disparities, iii) educational disparities, iv) the spatial distribution of jobs, v) residential discrimination, vi) employment discrimination.

Regressions

Because the model relies on a network of regressions, further elaboration of the variables may help illuminate the question. Much of the following work summarizes quite directly the theories of Galster, with a few important distinctions. Variable names are described in capital letter abbreviations. For the sake of convenience, I have retained the abbreviations used in Galster's project.

Regression 1. Residential Segregation: Pattern

The first regression models the pattern (PATTERN) of segregation. The pattern considers the geographic distribution of segregated groups within a Metropolitan Statistical Area. Galster calculated this pattern by measuring the degree of segregation in a series of concentric rings arranged around the center of the Central Business District. This measure of the pattern of racial residential segregation relies on the conceptual framework of the “inner-city.” The idea of the “inner-city” is related to the idea of “white flight” and the reality of redlining. The idea is that these two trends resulted in “inner cities” which were thought to be largely poor, underserved and black, surrounded by rings of more affluent and white suburbs. Under this conceptual framework, the measurement of segregation pattern through a concentric ring analysis makes sense.

Current trends, however, require that these forms of measurement be updated. The geography of poverty has changed over the last decades and the poor-to-rich, center-to-suburb gradient no longer so cleanly applies. Numerous studies have shown increasing poverty in the suburbs and gentrification of the center city areas, inverting and complicating the previous paradigm.¹⁷ The concept of the “inner-city,” however, can remain useful as a tool of analyzing residential segregation if we modify the way in which we calculate its geographic boundaries.

Under Galster’s rubric, pattern is a result of “class, self-segregation and discrimination.” For the purposes of this study, the pattern of segregation will be measured by the degree to which highly segregated black neighborhoods are located in areas served by over-enrolled schools, lacking in jobs and impoverished.

¹⁷ <http://www.brookings.edu/research/topics/suburban-poverty>

This is in accordance with Galster's statement that, "The primary means by which the centralized pattern of segregation is thought to affect the well-being of blacks is by restricting (1) their employment opportunities in light of the progressive decentralization of jobs in metropolitan areas, and (2) their access to quality education in light of fiscal difficulties of center city school districts." By mapping the location of under-funded schools, employment opportunities and poverty we are able to more precisely locate the contemporary 'inner-city' equivalent that may or may not be concentrated in the center of the city.

To achieve this, the number of jobs and the proportion of the population in poverty were mapped in GIS on the census tract level for each MSA under study. Additionally, every public school in the MSAs was mapped along with their respective student / teacher ratios. The data was then indexed on a scale of 0-1, and interpolated across the MSA. A composite 'At-Risk' score summarizing 1) availability of jobs, 2) student - teacher ratios and 3), poverty was assigned to each census tract. Higher scores indicate areas that are more likely to be poor, have little access to jobs, and have underperforming schools. Tracts in the top quartile constitute a different set of boundaries for the 'inner-city,' which can be referred to as 'At-Risk-Zones.'

In order to quantify the pattern of segregation, the 'At-Risk' score was correlated with the proportion of the black population per census tract on the MSA level. This coefficient represents the degree to which the black population resides in the 'At-Risk' areas.

The diagrams below illustrate the differences between the original and the updated methods for measuring the pattern of segregation. The top diagram shows

Galster's methodology where the concentration of the black population is measured within a series of concentric rings. The second diagram illustrates the updated methodology, which measures the concentration of the black population within an "At-Risk Zone" which is defined as having high concentrations of poverty, poor quality schools and lack of access to jobs. Neither diagram is associated with a particular geography; rather they serve as generic conceptual maps.

Fig 2. Original method of measuring PATTERN

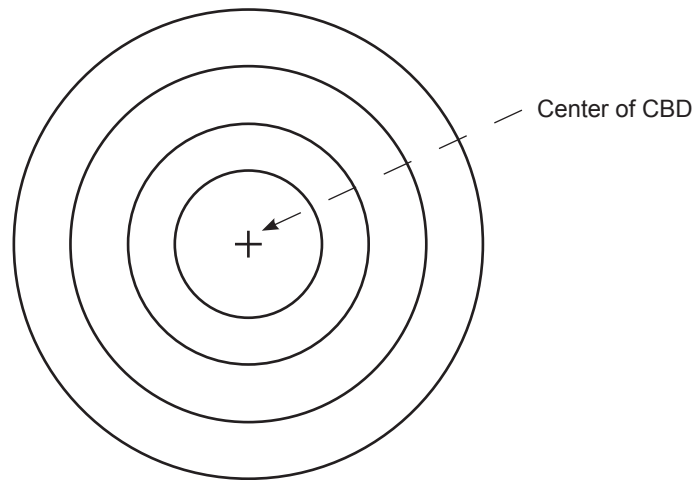


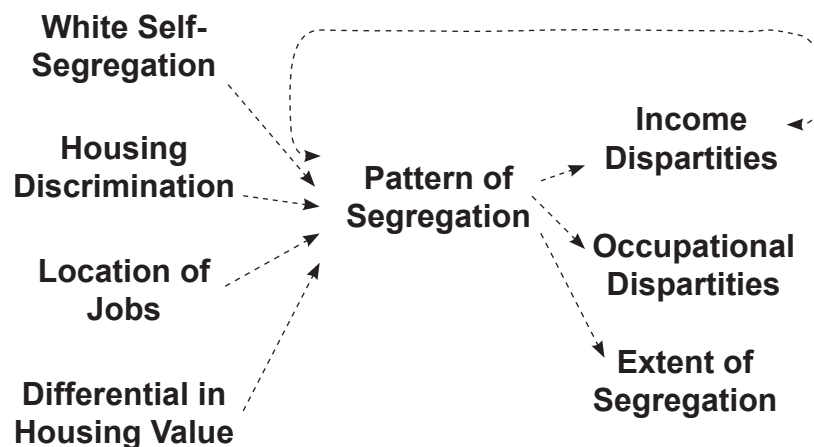
Fig. 3 Updated definition of PATTERN



In most MSAs studied, there was a positive correlation between 'At-Risk Zone' status and the proportion of the population that is black, i.e. black populations in these MSAs tend to be concentrated in more At-Risk areas. There are, however, several significant exceptions, including the largest cities studied. In Los Angeles, Atlanta, and Houston, there is a negative correlation between the variables. Likely, the existence of other racial groups affects this measure. The pattern correlation is weakest in cities with large Hispanic populations, exposing the fact that racial residential segregation is more complicated than the binary black-white model studied here.

A number of variables are regressed against the 'pattern' of segregation that may be categorized as those relating to class, self-segregation and discrimination, which Galster identifies as being the primary causes of segregation.

Fig. 4



Because At Risk Zones are defined by the fact that they are underserved, theory suggests that increased purchasing power would lead wealthier individuals

to reside elsewhere. Because of this, we would expect differentials between the median incomes of blacks and whites (BWMEDINC) to be related to the PATTERN of segregation. With a high differential between white and black income (in every case studied, whites make more than blacks), we would expect to find a higher concentration of the black population in the At-Risk Zones.

The ratio of the median value of housing stock within the At-Risk Zones relative to that of the larger MSA can also influence the pattern of segregation. When multiplied by (interacted with) the ratio of black to white median income (HSEGCCR), this variable represents the relative ability of different racial groups to afford housing in non-At-Risk Zones.

The pattern of residential segregation may also be affected by racial attitudes, either in the form of self-segregation (blacks choosing to live with blacks, and white with whites) or in housing discrimination (landlords or owners refusing to rent or sell to particular racial groups. We would expect the pattern of segregation to be positively correlated with the degree of discrimination.

Absent data that directly measures self-segregation, Galster suggests several proxies: the proportion of the MSA that is black (BWSMSA), the change in the black population over the preceding decade (CHNGPB), the proportion of the white population that is college educated (PWCOLLEG) and the proportion of the white population over age 45 (PW45YRP). Admittedly, these proxies are very rough measures, but each has its own logic. Large MSA black populations (LBSMSA), high ratios of blacks to whites (BWSMSA), and increasing black populations are all seen to be threatening to whites and may serve as drivers of white prejudice and self-

segregation on the city level. These factors are expected to correlate positively with PATTERN. Since college educated whites are shown to be less prejudiced towards blacks than those without college degrees, the proportion of the white population that has graduated college (PWCOLLEG) would be expected to negatively correlate with PATTERN.

Fortunately, there does exist concrete data relating to housing discrimination. In “Residential Segregation and Interracial Economic Disparities” major insights were made by the use of a new dataset compiled in 1977 by HUD in the Housing Market Practices Services that measures housing discrimination based on race. That data was compiled manually by sending white and black ‘auditors’ to open houses across forty SMSAs in the United States. Both auditors expressed interest in renting or purchasing available property and presented themselves to be equally qualified and financially capable for the housing in question. Meticulous data was collected regarding the differences in treatment the two candidates received and scores ranging from ‘black favored’ to ‘white favored’ were assigned.

HUD has replicated the methodology of this technique more recently, in 2000 and 2012, but in a much smaller range of MSAs – an inadequate sample size for this project. Instead, the regressions here rely on another data set that measures housing discrimination along racial lines. For “Statistical Discrimination or Prejudice? A Large Sample Field Experiment,” Ewens, Tomlin and Wang conducted a survey by contacting landlords in 34 MSAs electronically with purported inquiries into housing availability. Some of the correspondents were assigned names that are substantially more likely to be given to a black child than to a white one (Tremayne,

Jamal, Rasheed, Hakim are examples), and others were assigned more typically 'white names' (such as Todd, Greg, Brett or Matthew). These 'white' or 'black' names were isolated by statistical rather than subjective means. Like the HUD HMPS survey, meticulous data was collected regarding the responses to equally qualified candidates who were assigned either 'black' or 'white' names.

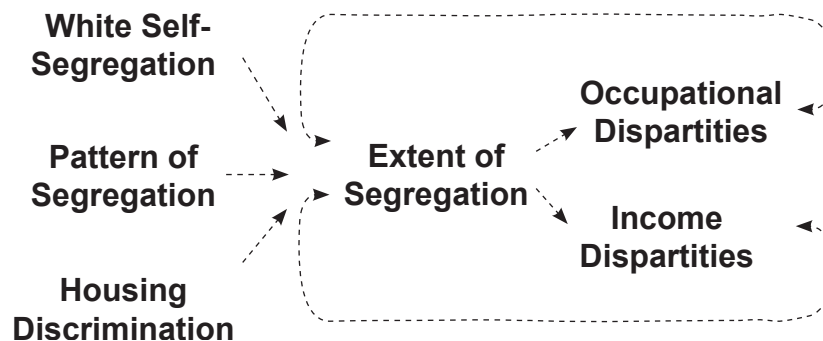
By creating a correlation coefficient for the variables of racial status and positive response rate from prospective landlords, an acceptable proxy for housing discrimination along racial lines was created. The higher the absolute value of this coefficient, the greater the degree of housing market discrimination within the MSA. In every MSA of the thirty-four studied, with the exception of statistically insignificant findings in Indianapolis and Denver, there is a negative correlation between black racial status and positive response rate from potential landlords indicating the continued existence of housing discrimination.

Lastly, the number of jobs in the At-Risk Zone (PCCJOBS) affects the pattern of segregation. In order to minimize travel time and costs, a residence near employment is desirable. Since the black population in MSAs tends to be poorer than the white population, the black population would therefore have fewer resources to expend on commuting. High concentration of jobs in the At-Risk Zones should therefore be related to a higher degree of segregation as measured by the pattern. PCCJOBS is calculated as the proportion of jobs located within the At-Risk Zone. Because the area of the city that these zones comprise varies, PCCJOBS has been normalized by the proportion of the city that is At-Risk. Because Galster's concentric circles were of consistent sizes, this step was unnecessary in his study.

Regression 2. Residential Segregation: Extent

As discussed earlier, the extent of segregation is an exposure index of whites to blacks. In short, extent is a measure of the amount of variation in racial composition there is between each tract and the MSA mean. The higher the degree of variation, the greater to degree of separation between the races. As Galster concisely explains, “EXTENT takes the value 100 if all blacks live in tracts that are 100% black and all whites live in tracts that are 100% white; it takes the value zero if the racial composition of every tract is identical to that for the SMSA as a whole.” Where pattern measures segregation spatially and in relation to other social factors, extent represents a more abstract, overall measure of segregation within the MSA. Regardless, pattern and extent are highly correlated.

Fig. 5



Interestingly, the EXTENT of segregation is least pronounced in the largest cities studied, including those cities with recent examples of unrest related to interracial disparities, such as Chicago and Los Angeles. Portland, Oregon, with a black population of around three percent, has an EXTENT score of 68, the highest of

the group, indicating that relatively small black population in Portland is highly concentrated. At the low end of the EXTENT spectrum, the cities exhibited ratios of black to white populations (BWSMSA) more near the mean.

The pattern of segregation is an important independent variable in this regression. Interracial economic inequities (BWMEDINC) are expected to be negatively correlated with the extent of segregation. Because housing types cluster (high value homes may be near other high value homes and vice-versa), we would expect to see a higher degree of segregation (in the form of EXTENT) with higher economic disparities between the races. Independent of income, workers in similar occupations tend to live near one another. Because of this, occupational disparities between the races (BWD OCCUP) should likewise impact the extent of segregation. If, for instance, all carpenters live together, and a disproportionate number of carpenters are white, the extent of segregation would increase.

Occupational disparities are measured through an index of dissimilarity (BWD OCCUP). Indexes of dissimilarity are most often used to measure segregation (though for this project, an exposure index was used instead). In this instance, the ratio of black to white workers in five separate fields was measured per census tract and individually compared to the overall numbers of black to white workers in each field. A high index indicates a high degree of segregation across the profession. An index was created for each job category available from the census, which are, broadly speaking: management, service, construction, production, and manufacturing. The summary index, used here, is an average figure, representing disparities not in any one field, but for all workers.

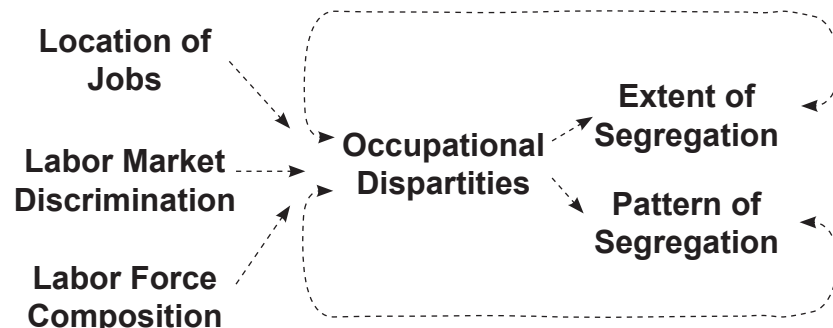
The extent of segregation should logically be associated with the ability of each racial group to pay for different qualities of housing (HOUSSEG). If there is a high differential in housing quality and high differential between median incomes of racial groups, it can be assumed that residential segregation would also be high. Galster describes this as 'the degree to which blacks are financially incapable of residing in the same [census] tracts as whites.' He measures this by multiplying a dissimilarity index of the proportions of homes per tract above and below median MSA value by the ratio of white to black median income: more simply this measures the variation in housing times the variation in income. Where Galster uses the proportion of homes above median MSA value per tract as the basis for the dissimilarity index, this study uses an index of dissimilarity comparing the difference between the top quartile home value per tract with the median home value and the bottom quartile home value with the median. This change is due to the availability of data. Both indexes analyze the degree to which the quality (measured by assessed monetary value) of housing varies across the MSA. Though there appears to be no obvious pattern in the distribution of HOUSSEG across MSAs in terms of large and small cities, low-rent and high-rent, low diversity and high diversity, northern and southern, etc. HOUSSEG is correlated to PCCJOBS.

In this regression the same proxies for self-segregation and discrimination are employed as were used in Regression 1, and for the same reasons.

Regression 3. Interracial Economic Disparities: Occupation

For this regression occupational disparities (BWDOCCUP) serves as the endogenous dependent variable. Whereas the previous regressions sought to understand the causes of segregation as a function of, among other things, economic disparities, this regression and the following one measure the opposite: how residential segregation causes economic disparities.

Fig. 6



The top four cities for occupational disparities are all midwestern, ‘rust belt’ cities: Milwaukee, Cleveland, Chicago, and Detroit, in that order. This is likely a result of the unique labor markets of these post-industrial cities. The cities with the least degree of BWDOCCUP are all southern (San Antonio, Austin, Raleigh, Charlotte).

Both the pattern and extent of segregation are expected to be directly related to occupational disparities. The pattern of segregation, by the very way it is measured, should be related to the availability of jobs. As black and white populations cluster, their respective access to specific jobs changes. Though BWDOCCUP and EXTENT do significantly correlate, in this study the cities with the

lowest degree of occupational disparities, exhibit above-mean measures of residential segregation.

The location of unemployment centers relative to the pattern of segregation as described above (PCCJOBS) is related to the occupational disparities amongst black and white populations. The extent to which jobs are located in the At-Risk Zones, and the concentration of the black population within those zones affects the relative accessibility of the black population to jobs. Where there are larger number of jobs in the At-Risk Zone and high concentrations of the black populations within that zone, we would anticipate a higher degree of accessibility of jobs to the black population and thus less disparity in the job market. BWOCUP is thus predicted to be negatively correlated with PCCJOBS.

Though discrimination in the housing and labor markets functions differently, the same set of variables for discrimination are employed in this regression for lack of better, more concrete data. If large black populations (LBSMSA), and a high ratio of blacks to whites (BWSMSA) is threatening to the white population, as we assume it is in Regression 1, it would logically follow that this same prejudice would manifest in the labor market. White employers in areas with large black populations may paradoxically be driven towards prejudiced hiring and firing decisions.

Galster points out that the opposite may be true for LBSMSA. He points out that: "A larger black community may be more able to assemble significant institutional and political power and thereby may more than overcome any intensified discriminatory barriers." Because of this ambiguity, no prediction is

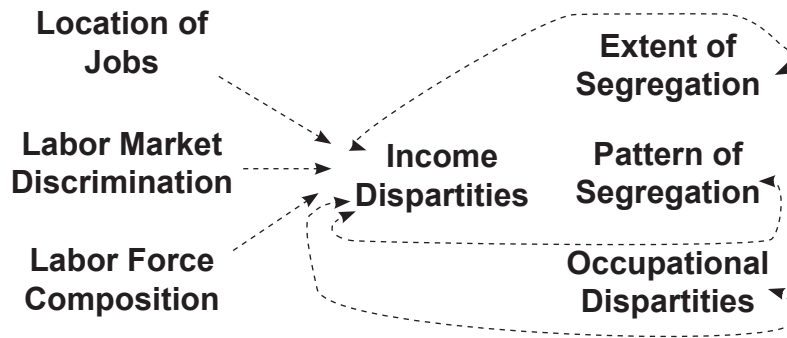
given with respect to the impact of the size of the black community on occupational disparities.

Variables related to the labor market are also considered. It is assumed that the manufacturing industry exhibits less discrimination than other sectors because of the manual labor and worker protections associated with that field. The relative size of the manufacturing sector (PMFG) is thus considered as a variable. Because unemployment (PUNEMPL) can be viewed as a driver of competition amongst job seekers, it can be assumed to be that unemployment would be positively correlated with occupational disparities, since employers have greater leeway to act in a discriminatory way.

Regression 4. Interracial Economic Disparities: Income

The disparity between black and white median incomes (BWMEDINC) is largely related to the variables listed above for Regression 3 because income and occupation are closely related. Where groups work in different fields, they may be expected to make different amounts of money. What distinguishes this regression from the previous example is that the endogenous dependent variable used above, BWDOCCUP, is included here as an independent variable. This is important because though BWMEDINC and BWDOCCUP are closely related, understanding the causes of one without the other may provide incomplete information.

Fig. 7

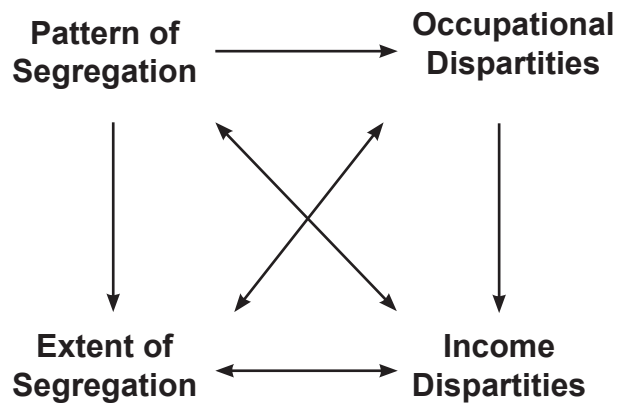


The Network of Regressions

Essentially two questions are asked in the above the set of regressions. They are: what are the causes of i) residential segregation, and ii) interracial economic disparities. That follows because “Residential Segregation and Interracial Economic Disparities” is the title of paper on which this thesis so heavily relies. It is assumed that causation between these two regressions is unclear: neither segregation nor income disparities is the clear source of the other, rather the total system perpetuates the problem.

While conceptually this network of regressions is useful for understanding these complicated dynamics in an intuitive way, the interrelatedness of the variables presents a complication in executing the statistical techniques.

Fig. 8



Each of the endogenous dependent variables for the respective regressions is highly correlated with one another, with the exception of PATTERN and BWMEDINC, which do not appear to covary.

Table 1: Correlations between dependent variables.

	EXTENT	PATTERN	BWDOCCUP	BWMEDINC
EXTENT	1			
PATTERN	-0.5274	1		
BWDOCCUP	-0.3509	0.3779	1	
BWMEDINC	0.1492	-0.0301	-0.4042	1

This inherently presents problems with multicollinearity since these variables are, in turn, used as independent variables in subsequent regressions. The problem is that, in the case of occupational disparities and income disparities in Regression 4, there may be a correlation between unaccounted for variables (error term) and the other endogenous variables. It is likely that BWDOCCUP is related to, for instance, MSA specific racism (distinct from self-segregation and discrimination) which itself is related to the error term of Regression 4, since we are unable to capture this factor with data. This creates bias and inconsistency. By instead regressing BWMEDINC on a predicted value of BWDOCCUP, that conflict is avoided. This technique of i) using proxies to create predicted values of independent variables, which are then ii) regressed against dependent variables as a structural regression is referred to as Two Stage Least Squares Regression, and is employed throughout this model. Each regression creates a predicted value for the dependent variable (\hat{y}). In subsequent regressions, using the predicted value in place of the actual

value eliminates a potential bias. Because all variables included in the regressions are continuous, linear regression is used throughout.

The following steps were performed: first, OLS regression was run for each of the systems. The models were then tested and adjusted for multicollinearity (using correlation matrix and VIF test), kurtosis (sktest) and heteroskedasticity (estat hettest). Having run the diagnostic tests, the endogenous variables were replaced by predicted values. This has the effect of eliminating bias in the form of multicollinearity of dependent variables in networks of regressions.

The next stage comprised repeating the series of robust OLS regressions, but substituting the predicted values for the observed data as in cases where the endogenous variables were engaged as independent variables. The coefficients presented below are the result of this second stage regression. Because of issues with multicollinearity, several variables discussed above have been excluded from the model. Proxy variables representing the potential for self-segregation, particularly the size of the black population (LBSMSA) and the ratio of the black to white population (BWSMSA) proved to be collinear, as did the measure of housing segregation (HOUSSEG). While including them both may make sense on theoretical grounds, the theoretical basis for keeping these variables is not sufficiently strong to risk biasing the model. In the end, each of the four regressions proved to be statistically significant at the 95% confidence level.

Results: Residential Segregation

The table below summarizes the results of the equations modeling residential segregation. Though there is overlap, our findings differ in significant

ways from both our anticipated results founded in theory, and Galster’s results from 1987. The most consistent predictor of racial residential segregation found in both terms of PATTERN and EXTENT and in this survey and Galster’s is the differential in income of blacks and whites. This is also, perhaps, the most intuitive variable: as the share of black income decreases, segregation increases. In the table below, those key variables that conform to our expectations of the model are highlighted in yellow.

Table 2: Coefficients Explaining Residential Segregation

Categories	Variables	Pred. Sign	EXTENT	Galster EXTENT	Pred. Sign	PATTERN	Galster PATTERN
	PATTERN	+	-7.716	0.190			
	EXTENT						
class	BWMEDINC	-	-0.077	0.905	-	-0.005	b -2.710
	BWOCCUP	+	-117.64	a 1.380			
	HOUSSEG						
white self-segregation	LBSMSA						
	BWSMSA	+	-29.129	a -0.212			
	PWCOLLEG	-	-0.214	a -1.930	-	0.001	c -3.940
	CHNGPB	+	-0.468	a 4.130	+	-0.468	a 0.124
	PW45YRP	+	72.559	0.079	+	-0.850	b -0.447
discrimination	HDISCRIM	+	46.720	0.151	+	-0.756	a 0.499
employment location	PCCJOBS				+	-0.090	0.234
	_cons		102.87	-176.60		0.509	
	r2		0.539	0.610		0.638	0.530

a, b, c = coefficients statistically significant at 99%, 95%, 90%, confidence levels respectively

Pred. Sign = expected sign of coefficient

yellow = essential variable that conforms to expectation; teal = essential variable that does not

The other class variable affecting segregation, BWOCCUP, is inversely related to the EXTENT of segregation. This finding contradicts intuition, theory and Galster’s findings. Because this variable is significant at a confidence level of <.01,

and since BWOCUP is such an integral component of this system of equations, this finding demands further inquiry. Those essential variables that deviate from our theoretical expectations of the model are highlighted in teal.

The logic of why occupational disparities and residential segregation should positively correlate may appear to be obvious: Different occupations provide different wages. As the racial discrepancy in occupations increases, one would assume that segregation would increase because there would presumably be a concurrent disparity in incomes and thus housing values between races.

What this may overlook, however, is that while some neighborhoods may be integrated spatially on the census tract level, social, economic and cultural disparities remain. This is particularly the case in gentrifying neighborhoods, where those in different racial or economic brackets live in close proximity to one another but likely live very different lifestyles including working in different fields. Where there are greater occupational disparities, there might also be greater potential for gentrification because of the resulting imbalance of resources. 'Reverse white flight,'¹⁸ which appears to have picked up steam at the beginning of the new century, is likely the phenomenon that drives the reversal in the association between occupational disparities and segregation. According to this logic, areas with the highest degree of occupational dissimilarity would be the most susceptible to gentrification in the form of a new generation of formerly suburban whites moving into cities. This phenomenon would further increase the occupational disparity as

18 Roberts, Sam. "'White Flight' Has Reversed, Census Finds." *The New York Times*, 22 Sept. 2008.

unlikely to be employed in the same field as those they displace, while simultaneously decreasing the measure of segregation. This theory explains the relationship on both sides of the regression.

This finding is bolstered by the literature on gentrification, in which some authors define the phenomenon partially as a function of education level. If gentrification is related to increased occupational disparities as we find here, that can be explained by the fact that gentrification is measured by education which itself is related to occupation. In this way, we can clearly see how gentrification is associated with economic disparities.

Further confirmation of this theory can be found in the literature. Through integration in the form of gentrification, minority populations “have tended to remain disadvantaged.”¹⁹ Thus, in accordance with our empirical model, integration and occupational disparities may logically be positively correlated, in spite of the previous assumptions.

The variables relating to white self-segregation, BWSMSA, PWCOLLEG, CHNGB, PW45PYB likewise return mixed results as measured by both PATTERN and EXTENT. As originally postulated, the natural log of the population of blacks and the ratio of the size of the black population to that of the white population were anticipated to lead to increased segregation according to both measures. This theory hinges on the idea that black populations constitute a perceived threat on the part of whites who accordingly self-segregate. In fact, the empirical data contradicts this view.

19 Hwang, Jackelyn. "Divergent Pathways of Gentrification: Racial Inequality and the Social Order of Renewal in Chicago Neighborhoods." *American Sociological Review*

This finding may also be accounted for by the gentrification theory. It is precisely the At-Risk Zones which are most likely to be gentrified due to low housing costs and the relative indifference of pioneering gentrifiers (typically not yet rearing children) to poorly performing schools.²⁰ In this way, MSAs with large black populations may in fact become more integrated (read: gentrified) over time.

Another way to analyze this is the relationship between the extent of segregation and gentrification. Because there is a strong positive correlation (.31) between the exposure rate of blacks to whites and the percent of census tracts that were gentrified between 2000-2010, we see that indeed highly segregated MSAs are the more likely to gentrify.²¹ Thus, the discrepancy between the expected and actual coefficients may be better explained by gentrification than they are by white self-segregation.

The other variables related to self-segregation perform as anticipated: as the proportion of whites who are college educated increases, residential segregation decreases; as the proportion of the white population who is over age 45 increases, segregation also increases.

The location of jobs relative to the At-Risk Zone (PCCJOBS) is inversely correlated with the concentration of the black population in the At-Risk Zone. This finding contradicts the anticipated result that high concentrations of jobs in the At-

20 Phippin, J. Wheston. "Top 5 Cities With Highest "Black Flight" The Atlantic. Atlantic Media Company, n.d. Web. 31 Mar. 2016.

21 Gentrification is defined here as increases in both income and proportion of adults with bachelors degrees in census tracts that had been at the 40th percentile of median MSA income. Data courtesy of: <http://www.governing.com/gov-data/census/gentrification-in-cities-governing-report.html#citieslist>

Risk Zone would results in high concentrations of the black population residing within the At-Risk Zone. The logic that led to this (mistaken) theory was that because of existing economic disparities between whites and blacks, blacks would be unable to afford the commuting expense of time and money, and would therefore be stuck living near work, likely in the At-Risk Zone.

Again the gentrification theory may help explain the discrepancy between the anticipated finding, Galster's finding, and the current result. The relatively high concentration of jobs within the At-Risk Zone may be exactly the phenomenon that draws gentrifiers. Thus, as employment opportunities in the At-Risk Zone increase, segregation decreases in the form of gentrification.

Housing discrimination exhibits the anticipated result when it comes to the extent, but not the pattern of segregation. While discrimination clearly still plays a role the decision-making of landlords, racial 'steering' (i.e. brokers directing blacks to segregated, and often less desirable, neighborhoods regardless of their ability to pay) does not seem to have the anticipated affect. Housing discrimination is negatively correlated with the pattern of segregation.

It is possible, in accordance with the alternate theory of gentrification outlined before that, while racial steering continues, it happens in such a way that segregation, as we measure it, actually decreases. In this way discriminatory landlords may direct white prospective clients to neighborhoods that exhibit strong correlations between the size of the black population, low-quality schools, and a dearth of employment (i.e. high PATTERN score). Conceived of this way, the pattern index decreases as discrimination increases. To summarize: while the variables

highlighted in yellow show how the causes of residential segregation have remained constant, those highlighted in teal may in part be explained by gentrification.

Results: Interracial Economic Disparities

A table containing the results for the regressions modeling interracial economic disparities is included below. While the models for residential segregation seem to indicate a fundamental shift, the economic modeling seems to have remained relatively more constant. While there are discrepancies between anticipated outcomes and the actual values, the coefficients I determined seem to be closely linked to those Galster found. Where we would anticipate a positive relationship between occupational disparities and unemployment, for instance, both this survey and Galster’s found the opposite to be true. The variables related to segregation are mixed in their explanation of the economic disparities.

Table 3: Coefficients Explaining Economic Disparities

Categories	Variables	Pred. Sign	BWOCCUP	Galster BWOCCUP	Pred. Sign	BWMEDINC	Galster BWMEDINC	
segregation	EXTENT	+	-0.003	c	0.393	-	-0.311	0.336
	PATTERN	+	0.088		-0.258	-	14.816	-0.546
labor force	BWOCCUP					-	-86.457	a
	BWCOLLEG	-	-0.002	b	-0.111			
	BW45YRP					-	114.825	-0.016
labor market	PCCJOBS	-	-0.134	c	-0.106	+	5.446	0.043
	PUNEMPL	+	-0.001		-0.766	-	2.732	a
	LBSMSA	?	-0.010		-4.620			
	BWSMSA	+	-0.010		0.314	-	-106.659	c
	PMFG	-	0.647	c	0.110	+	-133.078	a
	_cons		0.829		77.150		135.360	a
	r2		0.260		0.640		0.710	0.160

a, b, c = coefficients statistically significant at 99%, 95%, 90%, confidence levels respectively

Pred. Sign= expected sign of coefficient

yellow = essential variable that conforms to expectation; teal = essential variable that does not

Significantly, neither the EXTENT nor the PATTERN of segregation is shown to drive economic disparities as measured by median income or occupation at the 95% confidence level. There is only a very slight negative relationship between EXTENT and BWOCUP, which is significant only at the 90% confidence level.

The finding of no strong relationship between economic disparity and residential segregation may have to do with increased car ownership across races since the publication of Galster's 1987 article. It has been shown that minority employment (as measured both by quality and quantity) is sensitive to car ownership, since mobility allows job seekers to access a larger pool of potential employers.²² Black car ownership may render the impacts of the spatial separation of the races with respect to job access moot in cities where commuting by car is common and practicable.

This theory is not incompatible with the fact that PCCJOBS is negatively correlated with BWOCUP and positively correlated with BWMEDINC in keeping with our predictions. While car ownership reduces the inaccessibility of distant jobs to segregated black populations, relative proximity of jobs to said populations (PCCJOBS) naturally leads to better outcomes for the black population.

The labor market variable results are likewise mixed. Where we would anticipate a positive relationship between unemployment and occupational disparities because high unemployment gives employers more leeway to discriminate, we find that the opposite is true. Because the unemployment data

²² Raphael, Stephen, and Michael Stoll. Can Boosting Minority Car-Ownership Rates Narrow Inter-Racial Employment Gaps? Thesis. UC Berkeley, 2000.

collected is from 2009-2014, the data reflects the job losses of the Great Recession. During this event millions of jobs were lost. As individuals who lost their jobs were forced to find lower-income, lower-status work it may be that occupational disparities decreased because privileged whites were forced to work with blacks who were more likely to work in lower-status occupations.

The proportion of jobs in the manufacturing fields affects both BWOCUP and BWMEDINC in exactly the opposite way that was predicted and in contrast to Galster's findings. A high PMFG was expected to increase the ratio of black to white income and to decrease occupational disparities. This is because since manufacturing as a field demands a relatively low skill level and a high degree of manual labor it was thought to be less likely to be discriminatory (thus, high PMFG should = low BWOCUP). Because the manufacturing industry has a strong worker protections and unionization, high proportions of manufacturing jobs may lead to relatively high-paying jobs (high PMFG and high BWSMSA should = high BWMEDINC). Between 1987, when Galster published his study, and now, however, the manufacturing sector has seen a significant decline in the United States due to globalization and free trade agreements. Areas with high proportions of manufacturing jobs are therefore likely to be in serious decline, and more likely, therefore, to exhibit high disparities in income and occupation. Detroit, for instance, has the highest proportion of jobs in manufacturing (19%) of the thirty-four cities studied. It also has among the highest disparity in black to white median income.

The other statistically significant variable serving as a proxy for white discrimination against blacks, BWSMSA, acts as predicted: where there is a larger

ratio of black population to white population, there are greater discrepancies in income (BWMEDINC) between the races.

Conclusions:

In this case, the hypothesis that the dynamics of segregation and economic disparities have remained relatively consistent since this model was first established must be rejected. The dynamics of residential segregation and interracial economic disparities have fundamentally shifted. While the most obvious correlations remain relevant (that income disparities and housing discrimination are both related to residential segregation should come as no surprise), the bulk of the variables indicate that a shift has occurred. Further, an alternative theory (that of reverse white flight and gentrification) seems to better explain the findings than do the theoretical foundations upon which the model was originally established.

Again, because the null hypothesis was not rejected, any further conclusions, while rooted in the data and the literature, are speculative. To summarize those findings, however: Residential segregation continues to be a function of class as anticipated by theory. With respect to white self-segregation and discrimination of whites against blacks, however, our theory falls apart. This may be due in part to gentrification. Areas that had previously been populated with large black populations (and which our model would therefore predict to be highly segregated) are precisely those areas most likely to face integration in the form of gentrification. This theory is bolstered by the fact that among the cities under consideration for this study there is a strong relationship between segregation and gentrification, i.e.

the most segregated cities are the most likely to be gentrified. This way, where segregation might previously have been predicted, integration instead occurs. Further, gentrification, as has been described in the literature, often simultaneously exhibits residential integration and occupational disparities. This is what has been found in the model (BWOCUP is negatively correlated with EXTENT). Additionally, perhaps the single most dramatic demographic trends since Galster's original study are 'reverse white flight' and gentrification. It is not a stretch, therefore, to suggest that these trends may play a role in the difference between the two models.

The results with regards to the causes of economic disparities are likewise mixed. There appears to be no causal relationship between residential segregation and occupation or income disparities. High unemployment results in decreased occupational disparities. A high proportion of manufacturing jobs is related to increased income and occupational disparities. Each of these phenomena do not act as anticipated. The anomalies may partially be explained by increased car ownership, the Great Recession, and the decline of the manufacturing industry, respectively. Thus, the variables related to labor force characteristics and employment locations cease to be effective predictors of segregation at least as conceptualized by this model.

Limitations:

This study is subject to a number of limitations. As with all statistical models, it is not possible to account for all variables. This is particularly dangerous with a complicated, closed-loop model that gives the appearance of comprehensiveness.

Further, the smallest unit available for this project is the census tract. While census blocks provide a higher resolution of data, they are subject to high margins of error and are not therefore appropriate for this study. Census tracts contain roughly 4,000 people. A single data point for this many individuals cannot account for variation in the degree of segregation within the census tract.

The PATTERN variable that was reconceived for this model is itself subject to a number of limitations. Though it proved to be a statistically significant variable, it relies on a number of complex mathematical systems (GIS interpolation and raster calculation) that are vulnerable to failure. Additionally using student/teacher ratio as a measure of school quality is contested in the literature. Galster's choice to measure PATTERN through rings of concentric circles, while in a sense simplistic, operates on many levels and is difficult to replicate conceptually. In the concentric circle model, the inner city is: poor, black, has bad schools and few jobs but is located near the central business district. The new measure of PATTERN must estimate those characteristics for the other regressions to make sense. Replicating those conditions through proxy variables is necessarily messy. The theoretical basis for redefining the measurement of PATTERN, however, remains strong.

This model considers only two populations, black and white. While analyzing this binary is important due to the unique, complicated and often troubled historic relationship between these groups, this study overlooks other minority groups, especially Asian, Hispanic, Native American and multi-racial populations. This omission, though strategic, is necessarily limiting. Further, through neglecting to consider other races and ethnicities, it is possible that the model is not only making

an oversight with respect to these groups, but that the results are mathematically skewed by leaving them out. The share of the US population who is Hispanic, for instance, has increased considerably in recent decades. This development may partially explain some of the variation between the findings included here and Galster's findings from 1987.

Most importantly, social issues, particularly those that are highly charged such as race, cannot be reduced to quantitative analysis. To the extent that this study exposes fundamental structures in the dynamics of residential segregation it is useful. I suggest that it cannot, however, explain the overall experience – psychological, sociological, cultural, historical, emotional, ...-- that is essential to understanding the meaning of this inequality. I have tried to mask that fundamental weakness by limiting my study to quantitative methods.

Planning Implications:

The mandate of planners is to use our tools – policy, zoning, analysis, community organizing, advocacy, etc. – to create a more just world. Where inequality exists on a spatial level, a planner cannot be content. Racial residential segregation and its attendant adverse correlates is a fundamental challenge in American urban and otherwise areas. By identifying the causes and effects of this phenomenon, especially at a moment of flux in terms of the demographic dynamics of cities, planners may be able to devise strategies to mitigate the worst and most inequitable effects of segregation.

If the gentrification theory stands (this study can neither confirm or deny

that since it is beyond the scope of the hypothesis) we must consider the impacts of gentrification as an instrument of integration. If gentrification displaces previous residents (empirical results are mixed on this issue), gentrification serves only as a temporary agent of integration. Since displacement takes time, a period of integration would precede a new spatial distribution of segregation whereby previously highly segregated black neighborhoods are replaced by highly segregated white ones.

If, however, gentrification leads to displacement only on a limited scale, this process of integration leads to more ambiguous results. It may be that gentrification leads to a number of public goods that help the existing population more than they hurt it.²³ Increased tax revenues and political power may bring increased public services and higher quality public schools to previously underserved communities.

Because of the ambiguity of the effects of gentrification, public policy relating to it must be nuanced. Segregation, to the extent that it is related to disparities in income, education, health and other vital measures, is clearly a shameful inequity and legacy of an ugly history in this county of white treatment of blacks. Forced integration, however, either in the form of gentrification or otherwise may not be a preferable alternative in all cases. A more desirable outcome would likely be achieved by addressing the root causes of both segregation and occupational disparities.

While the merits and demerits of gentrification overall may be debated, it is

²³ Lang, M. Measuring Economic Benefits from Gentrification. *Journal of urban affairs*. 1986-09-01;8:27-39 and Byrne, J. Peter. "Two Cheers for Gentrification." Georgetown University Law Center. N.p., n.d. Web. 07 Apr. 2016

beyond question that gentrification has certain negative impacts. Since this model finds economic disparities to be associated with integration (theorized to be related to integration in the form of gentrification) specific strategies to combat these forces may prove useful. The journal of Race, Poverty and the Environment lists the following strategies to combat the negative effects of gentrification:²⁴ i) community assessment of neighborhood changes, ii) the creation / maintenance of affordable housing options, iii) stabilizing existing renters, iv) community-developed zoning and development strategies, v) creation / maintenance of social infrastructure. These strategies aim to provide the existing community with the resources necessary to maintain their current housing in spite of the pressures of encroaching development. Specific tools within these strategies are, among dozens of others:²⁵ i) community land trusts, ii) housing trust funds, iii) inclusionary zoning. None of these tools or strategies are available to those without access to political power. Political organizing on the part of communities and non-profits is therefore a prerequisite to many of these actions.

In short, gentrification minimizes segregation (PATTERN and EXTENT). The above strategies for mitigating the negative effects of gentrification, while accepting existing occupational (BWOCUP) and income (BWMEDINC) disparities, seek to minimize the extent to which blacks cannot afford to live with whites (HUSSEG).

Unfortunately, this model is neither equipped to measure social infrastructure within MSAs or displacement as a result of gentrification. If we

24 Rose, Kalima. "Combating Gentrification Through Equitable Development." Race, Poverty and the Environment

25 *ibid.*

assume, though, that many of the adverse effects of residential segregation are due to a lack of this type of infrastructure, mitigated gentrification can provide public goods. In this scenario, the suggestions put forth by the Journal of Race, Poverty and the Environment provide a framework for constructive integration whereby the gentry bring with them community improvements, and displacement and cultural isolation of existing populations is minimized.

What these guidelines do not specifically provide, however, is a remedy for income disparities. In fact, as described above, these strategies accept given levels of BWOCCUP and BWMEDINC during gentrification: their strategies specifically aim to combat HOUSSSEG. We know, though, that BWOCCUP is a significant predictor of BWMEDINC. This makes intuitive sense, and is confirmed by the model.

If we are not content to accept mitigated gentrification along the lines described by the Journal of Race, Poverty and the Environment, however, and instead require improvements with regard to BWMEDINC, job strategies must be employed. Likely this needs to be a long-term endeavor. Occupational disparities often are related to disparities in education. Integration itself is likely to be the best remedy for educational disparities. Datcher finds that by moving from an average black neighborhood to an average white neighborhood, a black male raises his educational attainment by a year.²⁶ It is not unreasonable to assume, therefore, that integration will improve schools and have the long-term effects of decreasing occupational and subsequently income disparities.

²⁶ Datcher summarized in: Massey, Douglas. "Residential Segregation and Neighborhood Conditions in U.S. Metropolitan Areas." *America Becoming: Racial Trends and Their Consequences* 1 (n.d.): n. pag. National Academy Press.

While the gentrification theory provides an alternative explanation of a number of unexpected findings in this study, the finding that housing discrimination is positively correlated with the extent of segregation is a more definitive. Discrimination against blacks therefore perpetuates segregation, and the myriad ills that accompany it.

The Supreme Court's ruling in *Texas Dept. of Housing and Community Affairs v. The Inclusive Communities Project, Inc.* that upheld the disparate impact threshold in Fair Housing Act cases is a welcome development.²⁷ The Inclusive Communities Project, a Dallas non-profit, had sued the State of Texas for distributing low-income tax credits only in underserved and minority communities. Because a majority of those qualifying to live in these developments themselves were of minority status, the distribution of these tax-credits across Dallas had a segregatory impact. Because discriminatory intent is so difficult to prove (no developer is likely to openly state their plans to discriminate), the disparate impact threshold is a crucial tool in the enforcement of the FHA.

The FHA is a primary federal government tool in the fight against residential segregation.²⁸ By any measure, the act has not entirely achieved its objectives. This, not only in the persistence of residential segregation nearly fifty years after its enactment, but also in the disparities in health, education, income, etc. Housing discrimination is still relatively hard to prove. Though intent is not required in FHA

27 *Texas Dept. of Housing and Community Affairs v. The Inclusive Communities Project, Inc.* That. The Supreme Court. 25 June 2015

28 Trifun, Natasha. "Residential Segregation after the Fair Housing Act." American Bar Association.

cases, statistical analyses alone are inadequate proof under law. Some direct mechanism or system that has the effect of perpetuating segregation must be identified as well in order to prove discrimination.

In spite of its shortcomings, the FHA remains an important tool in the fight for integration, and a bulwark against discriminatory developers and landlords. The *Texas* case is an important example of how the FHA can work best. If the state had distributed the tax credits in such a way as to have an integrative impact, the state would not only have been integrating along racial lines, but would likely have helped alleviate economic disparities as well. This is because the ratio of black to white income (BWMEDINC) was found to be negatively correlated with segregation (PATTERN and EXTENT), i.e. economic disparities and segregation go hand in hand. It would follow, therefore, that increasing integration would also help alleviate economic inequities.

Mere weeks after the Supreme Court ruling upholding the disparate impact threshold, HUD initiated its Rule on Affirmatively Furthering Fair Housing (AFFH). If the alternate hypothesis of gentrification is correct, then our model based on data from thirty-four MSAs across the country is no longer relevant as a predictor of segregation at the local level. We know that residential segregation and economic disparities persist, but the model seems to be inconsistent in its predictions. In this event, site-specific interventions are likely to prove most successful. The recent HUD rule can be an important tool for achieving that goal.

The Rule on Affirmatively Furthering Fair Housing is more or less three-fold: it i) provides communities with data and mapping tools (both general and local), ii)

enables and facilitates local and community decision-making, and iii) allows smaller communities more time to adapt and develop to the new rules. Each of these three strategies gets to the point of empowering local communities to promote fair housing within their jurisdictions. Whereas statistical modeling may not be able to distinguish between the more negative impacts of gentrification and constructive integration, “local data, ... including information obtained through the community participation process,” is more likely to parse the difference.²⁹

More significantly, the rule makes continued federal grants conditional on localities accepting this new methodology. Whereas before communities were simply required to not discriminate, under the new guidelines they must develop strategies based on local, regional and national data, both qualitative and quantitative, to demonstrate to HUD an affirmative strategy for fair housing. Boston, for instance, with relatively high levels of segregation (PATTERN and EXTENT), high disparities in income, but relatively low levels of occupational disparity would likely not be best served by the same intervention that proves successful for Milwaukee, with low levels of segregation and occupational disparity, but high levels income disparity. The need for site-specific interventions is predicated by the idea that statistical models such as the one attempted above often provide mixed and ambiguous results, with less than evident policy implications.

Together, these recent FHA developments (*Texas* and *AFFH*) serve as potentially powerful tools to promote and enforce (constructive) integration and

²⁹ United States. Housing and Urban Development. HUD Rule on Affirmatively Furthering Fair Housing Executive Summary.

reduce economic disparities between the races. As such, they are constructive policies. They are limited in scope, however, because they rely on an incentive based structure. Westchester County in New York, for instance, opted out of federal funding opportunities in order to unyoke itself from fair housing regulations. Where this is an option, the AFFH lacks teeth.

As discussed above, the model employed in this paper has mixed success at predicting segregation and economic disparities nationally at the MSA level. Localized planning strategies are therefore preferred. Cincinnati, Louisville and Atlanta have each been removed from a list of hyper-segregated cities compiled by Massey in recent years. Their strategies for achieving this goal were decidedly local in approach. Cincinnati embarked on a simultaneous project of beautification, local economic development and affordable housing construction. Louisville instituted a policy of busing city students to the suburbs and vice versa. This project simultaneously fought economic and institutional disparities and reduced the incentive for 'white flight.' In Louisville, this approach appears to have worked because the political and popular will supported it, despite the reputation of the busing strategy as being an ineffective social tool. In Atlanta, foreclosures posed a serious threat to a growing black middle-class and increased the likelihood of a concentration of poverty. The aggressive construction of affordable housing helped mitigate these risks and ultimately reduce segregation.³⁰

Though these three examples each separately achieved the goal of

30 Henderson, Tim. "How Some Cities Reverse Segregation." *Governing*. 07 Apr. 2016.

integration, no one of these examples comprise universal strategies for combatting residential segregation or economic disparities, beyond the fact that they are each site specific, react to the particular economic conditions of the time, and harness local political will. These examples each illustrate the potential power of the AFFH rule. Where cities have already affirmatively combatted segregation, there are examples of success. The HUD resources provided by AFFH as well as the incentives it provides should serve as a stimulus to promote these types of constructive local strategies.

In sum, though the coefficients output by this model on the whole did not conform to expectations, they nonetheless provoked issues that can be addressed by targeted planning actions. Those actions are: i) continued implementation and enforcement of the FHA and AFFH, including continued funding for HUD in general, ii) MSA and community specific affirmative actions to combat both segregation and the negative impacts of gentrification, and iii) the strategies outlined by the journal of Race, Poverty and the Environment to combat gentrification.