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A MARKET SEPARATION THEORY OF RENT DIFFERENTIALS  
IN METROPOLITAN AREAS

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## ABSTRACT

This study represents an attempt to explain rent differentials for whites and non-whites within metropolitan areas via a market separation model. Racial separation creates two distinct markets that are nominally integrated but between which flows of information, labor, and capital are not unrestricted; thus, differential prices for similar commodities may co-exist in the two markets. This study focuses on rents, based on the hypothesis that rent differential between white and non-white areas of the city can be attributed to three major forces: (1) the rate of growth of the non-white population; (2) the rate at which whites evacuate the center city; and (3) the degree to which non-white areas are centralized in the metropolitan area. These hypotheses are tested using a cross section of aggregate data for metropolitan areas from the 1950 and 1960 census; and in each case the coefficients are significant and supportive.

One noteworthy finding is that segregation does not appear to be a determinant of rent differentials, a result that coincides with the model since segregation merely indicates market separation and is not of itself an economic force that creates rent differentials. The authors conclude that policies designed to facilitate expansion by Negro communities may have greater impact on their economic well-being than will policies designed to reduce segregation and thus potential insight is provided into the motivations of the black separatist movement.

A MARKET SEPARATION THEORY OF  
RENT DIFFERENTIALS IN METROPOLITAN AREAS

The character of our metropolitan areas suggests a theory of market separation to explain economic differentials among the various geographic and racial sections of cities. Social and cultural characteristics limiting the free mobility of people, goods, and information, create conditions under which economic variables may take on different values in two markets that are geographically close and nominally integrated.

The purpose of this paper is to generate a model, based upon rather simple notions of market separation, to explain rent differentials between white and non-white sections of cities. These notions are then tested using a cross-section regression analysis on 1960 census data for U. S. metropolitan areas.

The General Model

Figure 1 depicts generally the population forces at work in metropolitan areas of both the North and the South in the 20th Century. The influx of Negroes into the center city has created expanding ghettos that have pushed wealthier whites out to the suburbs. The underlying economic, social, and cultural differences have created rather well-defined borders between the races across which

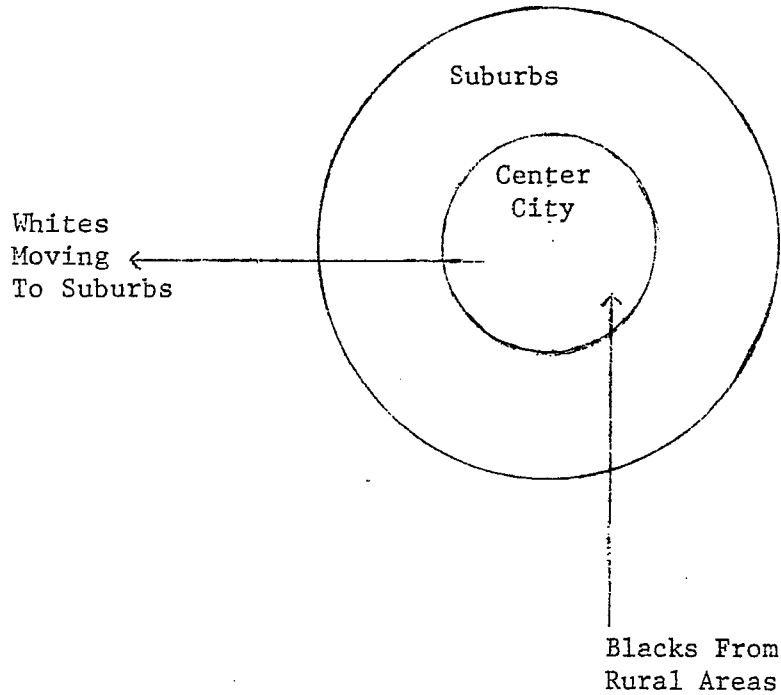


Figure 1

the flows of information, trade, and migration are not free. The sheer rate at which Negroes have migrated to metropolitan ghettos has put severe pressure on the borders between the races, pushing them back and driving whites farther from the ghetto centers.

The racial borders act effectively as trade barriers that can make price differentials possible between the black and white market areas. And, the more rapid the migration of Negroes into the ghetto area or the more resistant the white wall that surrounds the ghetto, the more evidence we should find of price differentials accompanying

racial congregation. These price differentials may show up in many commodities, but the primary evidence should be in the most immobile commodity of all, land. Thus, our study focuses on rents--the price of location.

The extent of observed rent differentials between white and black areas should be dependent on three basic characteristics of the metropolitan area: (1) the rate of influx of Negroes, (2) the rate at which whites pull back from the ghetto borders, and (3) the existence of spillover possibilities for Negroes to jump white areas altogether or to move out into relatively unpopulated areas of the city.

The hypothesized relationship between rent differentials and growth in the Negro population is a straightforward derivation of a market separation model. Negroes have migrated from rural to metropolitan areas because of better economic opportunities. They bid up the prices of location in those areas of the city that are open to them, and--assuming a given propensity for new locations to be made available--greater growth in the Negro population will result in increasing rent differentials between the Negro ghettos and other areas of the city.

The wall of whites around ghetto areas will resist the outflow of Negroes into surrounding areas. In the face of increasing rent differentials or simple threat of integration, whites in surrounding areas will be induced to move to the suburbs or other parts of the central city. But the speed of white evacuation is dependent on

other variables such as age, education, and income. Studies have shown that mobility is related inversely with age, and directly with education and income [18]. To the extent that ghetto areas are surrounded by a white community with adverse mobility characteristics, the outward movement of the ghetto will be resisted, and rent differentials between white and Negro areas will be greater.

The impact on rent differentials of Negro population growth and white evacuation has been previously described in the literature. For example, Gary Becker suggests that these forces explain the phenomenon that northern Negroes apparently paid relatively higher rents in 1957 than southern Negroes paid, even though white "discrimination" against Negroes was supposedly more severe in the South [3, p. 61]. The Negro population was expanding more rapidly in the northern cities. Citing a 1935 census study [23] that indicated Negroes paid higher rent than whites for equivalent housing, Robert Weaver suggested that this was inevitable "*as long as there were appreciable numbers of colored people coming into the cities of the North.*" [24, p. 36, his italics]. In neither case, however, were rent differentials systematically related to differential rates of growth in Negro communities.

A third, and we believe very important, characteristic that influences Negro-white rent differentials within metropolitan areas, and which has not been described in the literature, is the geographic nature of the wall surrounding the ghetto. Consider Figure 2, diagrams (a), (b), and (c).

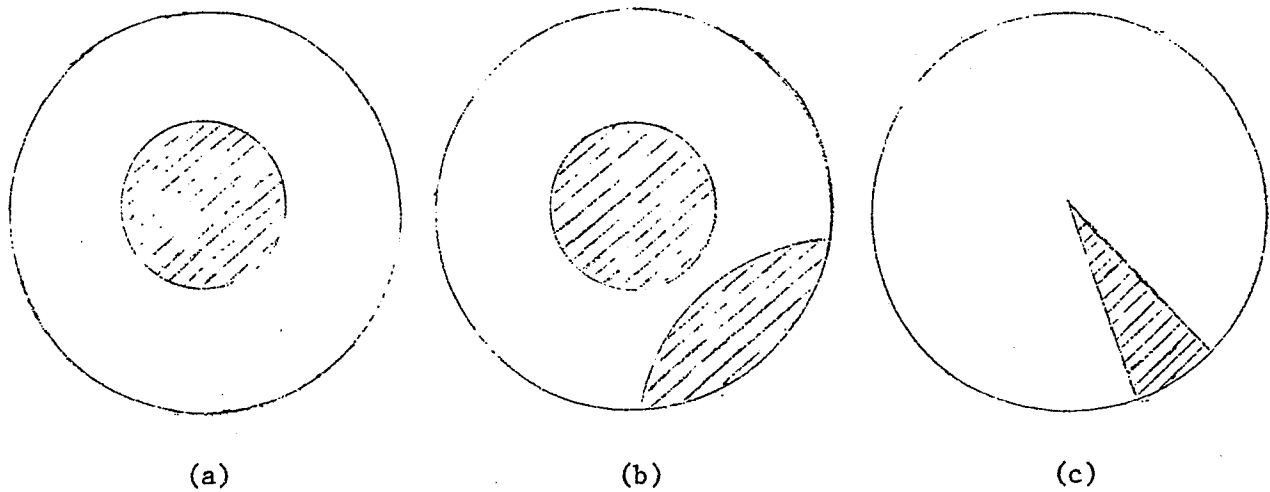


Figure 2

The situation in (a) is one in which the Negro community is completely contained by the surrounding white community. Compare this with (c) where the Negro community borders on the open regions surrounding the metropolitan area. In this case, rising rent levels will induce the Negro community to spillover into the surrounding countryside easing the upward pressure on rents. This notion can be derived from Turner's "safety-valve" theorem of frontier development [3, 17]. Similarly, in (b), the existence of Negro communities in outlying areas of the metropolis may enable ghetto dwellers to urbanize the relatively cheap land of the countryside by leaping over the surrounding white community thereby easing pressure on rents in central areas.<sup>1</sup>

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<sup>1</sup>The adverse impact of centralization of ghetto areas on Negro employment has been demonstrated in recent articles by John F. Kain [8] and James O. Wheeler [25].



### The Regression Model

To test the relationships hypothesized in the previous section, we have formulated a regression model using cross section data for 82 metropolitan areas. The 82 areas selected were those standard metropolitan statistical areas with populations in excess of 250,000 in 1960 for which the non-white population was sufficiently large for the Census Bureau to provide the detailed data required for our analysis. (The list of 82 cities is shown in the Appendix.) Except where otherwise noted, data were taken from the various census publications for 1950 and 1960 [19, 20, 21].

Our dependent variable is an estimated ratio of median white rents to median Negro rents in the metropolitan areas. All rents are gross and unadjusted for size of dwelling unit or condition of repair. Because of the aggregate nature of our data, we judged that these factors would be more appropriately introduced via control variables, as indicated below.

The independent variables can be classified as either primary (those that test for one hypothesized effect) or control (those that account for other factors that influence the relationships to be tested).

Primary variables. Our growth variable is measured by the log of the rate of increase in the non-white population in standard statistical metropolitan areas between 1950 and 1960. Adjustments were made for census changes in the geographic definition of metropolitan areas. Our use of the logged value of the growth rate

derives from the notion that growth in the Negro population impinges directly on Negro rents but not on white rents. The "safety valve" or ability of the white community to spill over into the countryside would tap off pressure on white rents from population growth at the core. But, the Negro community cannot freely spill over into other areas; it is contained. And, since we assume a linear relationship between growth and Negro rents, the expected relationship between growth and the ratio of white to Negro rents is curvilinear. Thus, the log of the growth variable was employed to linearize the growth and rent ratio relationships for purposes of our regression analysis. We hypothesize a negative relationship between growth and white rents relative to non-white rents.

To measure the rate at which the whites evacuate in the face of ghetto pressure we have used an estimate of the rate of increase in the suburban population between 1950 and 1960.<sup>2</sup> The measure clearly does not allow for white mobility within the center city, and does not account for white influx to suburbs from other areas altogether; but the difficulty of obtaining data that would isolate such factors makes a more sophisticated measure impractical. The evacuation index was logged for reasons similar to those noted above for the growth variable. We hypothesize that the relationship between evacuation and the rent ratio will be positive.

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<sup>2</sup>The Census Bureau's estimates reflect adjustments for annexations and changes in the size of the SMSA [20].

To obtain a measure of the extent to which the black ghetto is centralized or well contained within the center city we have constructed an index of centralization based upon a relationship between the percentage of non-whites in the SMSA living within the center city and the size of the center city relative to the SMSA. Essentially, the index of centralization for any metropolitan area is the residual value of the percentage of non-whites living in the center city from a regression line on the size of the center city relative to the total SMSA.<sup>3</sup> Again, logs were used for the index of centralization. If our theory of containment holds, the relationship between centralization and the rent ratio should be negative.

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<sup>3</sup>The value of the centralization variable for any metropolitan area  $i$  is  $u_i$  from the relationship:

$$y_i = a + bx_i + u_i$$

where:

$$y_i = \frac{\text{non-whites in center city (i)}}{\text{non-whites in total SMSA (i)}}$$

$$x_i = \frac{\text{total population center city (i)}}{\text{total population SMSA (i)}}$$

This regression was run using data for the 82 cities. A value of  $u_i$  equal to zero means that the SMSA has an average concentration of Negroes in the center city. A positive or negative  $u_i$  implies greater or less than average concentration respectively.

This method of measuring concentration is preferred to the simple ratio  $y_i/x_i$  or differential  $y_i - x_i$  since the density of Negroes relative to whites generally declines with distance from the core of the city [12, pp. 32-66]. A decline in relative Negro density would lead to a decrease in both  $y_i/x_i$  and  $y_i - x_i$  if the boundary of the center city expanded to encompass more of the metropolitan area, even though the actual concentration of Negroes in the area remained the same. That is,  $y_i/x_i$  and  $y_i - x_i$  are not independent of  $x_i$ . The residual in our regression takes account of declining relative Negro densities and may be taken to express the residual relative centralization of Negroes that cannot be explained by the relative centralization of the total population.

Control variables. To control for the size and condition of housing in black and white sections of the metropolitan area we have introduced, as variables, estimates of (1) the ratio of the percentage of all-white dwelling units judged to be dilapidated to the percentage of black units that are dilapidated, and (2) the ratio of median rooms in white dwelling units to median rooms in non-white units. The anticipated relationships with the dependent variable are negative in the case of (1) and positive in the case of (2). Since income is clearly a determinant of housing expenditures, we have included the ratio of median white family income to median non-white family income as a third control variable. The expected relationship here with the dependent variable is obviously positive.

Another variable we have used reflects the degree of segregation of the races; that is, the degree to which the white and non-white areas are homogeneous in racial make-up. There is no need for this characteristic to be systematically related to the centralization of the ghetto, and, indeed, the empirical evidence will later bear this out (Table 1). In general, segregation evidences separation of housing markets; but it does not provide theoretical insight into which market--white or non-white--will have the relatively higher rents. Growth of the non-white community and white evacuation provide theoretically sound evidence of upward pressure on rents inside the ghetto, and centralization measures the ability of such pressure to find outlets through population spillovers from the ghetto to other areas. Segregation, however, does not identify pressure in either

market, but merely the existence of different markets. Becker's growth explanation of higher Negro-white rent differentials in the North in the face of greater "discrimination" in the South reflects similar thinking, although he does not explicitly employ a segregation variable in a market separation model [3, p.62]. While we cannot, on an a priori basis, formulate a hypothesis to explain any relationship between segregation and rent differentials, policy concern with this social situation and an intuitive feel for its significance lead us to include segregation as a variable in the regression analysis. Our measure of the degree of segregation was taken from the work of Taeuber and Taeuber [16, pp. 28-43]; essentially, it is an index of the percentage of non-white persons who would have to move to create a block-by-block perfectly integrated community. Consistent with the other non-ratio variables, logs of the segregation variable were employed to linearize any expected relationship to the dependent variable.

The final variable considered was per capita welfare payments by states for family assistance. Some critics have asserted that increased welfare payments merely work to drive up rents paid by recipients. We wondered whether such an effect would show up in aggregate data--namely, whether relatively higher welfare payments would increase rent differentials between the white and non-white communities. Welfare data were taken from the Compendium of State Government Finances for 1960 [22].

Summary of the variables. The following list summarizes and symbolizes the variables described above:

- Y = Ratio of median gross rents
- $x_g$  = Rate of non-white population growth (logs)
- $x_e$  = Rate of white evacuation (logs)
- $x_c$  = Index of non-white centralization (logs)
- $x_d$  = Ratio of dilapidated units
- $x_r$  = Ratio of median rooms
- $x_i$  = Ratio of median incomes
- $x_s$  = Index of segregation (logs)
- $x_w$  = Per-capita welfare payments

#### Correlation and Regression Results

The matrix of simple correlation coefficients and variants of the regression analysis are shown in tables 1 and 2. In general, the correlation matrix reveals a substantial lack of interdependence among the primary variables in the analysis. The only troublesome inter-correlation occurs among some of the control variables, and we tested for the sensitivity of the T-ratios by running variants of the basic regression, alternatively eliminating each of the problem control variables, with the exception of the income variable which is basic to the analysis. Table 2 indicates that the parameters for the major test variables of centralization ( $x_c$ ), growth ( $x_g$ ), and evacuation ( $x_e$ ) are relatively insensitive to the control variables selected. The  $R^2$  are all high for cross-section analyses.

The index of centralization and the rate of growth in non-white population were both significant at better than the five per cent level for all variants of the regression. The evacuation variable was generally significant at the fifteen per cent level for all variants.

Table 1

## MATRIX OF SIMPLE CORRELATION COEFFICIENTS

Y	$x_g$	$x_e$	$x_c$	$x_d$	$x_r$	$x_i$	$x_s$	$x_w$	
1.00	-.46	.00	-.36	-.16	.62	.65	.38	.06	Y
	1.00	.18	.03	.15	-.34	-.37	-.32	.07	$x_g$
		1.00	.13	-.17	.05	-.21	.05	-.01	$x_e$
			1.00	-.28	-.31	-.31	.10	-.20	$x_c$
				1.00	-.28	-.22	.02	.13	$x_d$
					1.00	.65	.31	.04	$x_r$
						1.00	.45	.09	$x_i$
							1.00	-.15	$x_s$
								1.00	$x_w$

Table 2

REGRESSION COEFFICIENTS  
(T-ratios in Parentheses)

Regression Variant	Variables Included								$R^2$ (d. f. in parentheses)
	$x_g$	$x_e$	$x_c$	$x_d$	$x_r$	$x_l$	$x_s$	$x_w$	
(1)	-.067 (-2.88)	.018 (1.40)	-.248 (-2.38)	-.038 (-.55)	.238 (1.78)	.161 (2.58)	.207 (1.27)	.001 (.55)	.584 (73)
(2)	-.067 (-2.88)	.019 (1.45)	-.251 (-2.43)	-.032 (-.48)	.238 (1.79)	.167 (2.72)	.189 (1.19)		.582 (74)
(3)	-.068 (-2.95)	.020 (1.61)	-.227 (-2.51)		.252 (1.95)	.175 (2.99)	.164 (1.10)		.581 (75)
(4)	-.073 (-3.16)	.024 (1.85)	-.300 (-2.97)	-.059 (-.88)		.215 (3.89)	.210 (1.30)		.564 (75)
(5)	-.072 (-3.17)	.022 (1.76)	-.205 (-2.13)	-.005 (-.08)	.250 (1.87)	.199 (3.62)			.574 (75)
(6)	-.069 (-2.96)	.020 (1.57)	-.222 (-2.40)		.255 (1.96)	.171 (2.89)	.175 (1.16)	.001 (.48)	.582 (74)
(7)	-.074 (-3.16)	.023 (1.79)	-.297 (-2.92)	-.065 (-.95)		.210 (3.71)	.228 (1.38)	.001 (.54)	.566 (74)



The control variables for rooms, dilapidation, and income all have the expected sign and, except for dilapidation, are generally significant at better than the ten per cent level. Again, the general stability of the coefficients and T-ratios might be noted. The index of segregation is positive for all variants but not significant; and the welfare variable is similarly positive but insignificant in all variants.

#### Evaluation

The results substantiate all of the hypotheses previously advanced. To the extent that aggregate data of this nature can reveal evidence of price differential phenomena, our theory of market separation indicates that rent differentials between the white and black community depend upon the nature of the containment and growth of ghettos within the metropolitan area.

Location of the ghetto area inside the central city tends to increase rents that ghetto residents, primarily Negroes, pay. We are aware of an alternative hypothesis, that would explain this phenomenon through the proximity of ghettos to the high-value area at the core of the city. However, investigation of other studies on rents of land values in relationship to distance from the core of cities suggests that ours is the more viable hypothesis. Surveys performed at the Survey Research Center of the University of Michigan clearly indicate people's preference to live away from downtown areas [10]. Empirical evidence on location and rents or land values has shown that land values tend to decrease as one approaches the very business

core of the city--where, of course, rents and values rise sharply [6, 7, 9]. If it is true that rents or land values are not generally subject to a decreasing gradient with increased distance from the city core, then our centralization hypothesis would seem to be the more reasonable explanation of the relatively higher rents paid by non-whites when the ghetto is centralized.

Our finding that rapid growth of the non-white population tends to increase relative rents paid by non-whites is subject to less question, and is evidence of the phenomenon that separation of the races in metropolitan areas creates price differentials that can only be explained by a market separation model. If the markets were not effectively separated by racial structure, we would expect that the influx of non-whites to the cities would tend to increase rents across the board and not the relative rents paid by non-whites.

Similarly, the findings show that a more rapid rate of suburbanization, largely by whites, tends to reduce relative rents paid by the non-white community. Again, we are aware that the simple rate of suburbanization is not a very precise measure of the force we wish to isolate--the rate at which the white barrier to black ghettos responds to social and economic pressure from ghetto expansion; however, its significance in our regression findings lead us to conclude that an evacuation phenomenon operates in metropolitan areas to affect the rents paid by ghetto residents. Further studies at a less aggregate level, to isolate more precisely the impact of mobility of whites in center cities, particularly in areas surrounding ghettos, would clearly be in order.

Parenthetically, we might note that our empirical model does not permit us to make inferences about any long-run equilibrium rent differential which might exist in the absence of Negro growth and white evacuation. Such inferences would require (1) more exacting control for equivalency of housing units than is possible in our aggregate model, and (2) specification of any taste differentials between the racial communities. Theoretically, price differentials can exist as long as markets are indeed separate, even though demands may be stable in the various markets. However, our empirical model entitles us to say only that whatever differential (zero or otherwise) may exist in a stable state, Negro growth will accentuate it and white evacuation attenuate it.<sup>4</sup>

Probably the most surprising result, and most pleasing in light of our hypothesis, is the general insignificance of the segregation variable. Intuition and common concern might lead to the hypothesis that mere segregation could tend to increase Negro rents relative to whites. However, theoretical scrutiny should lead to the observation

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<sup>4</sup>Margaret Reid apparently holds that Negroes and whites pay the same rent for equivalent housing, attributing contrary observations to failure to account for permanent income-[14, pp. 106-107, 389-390]. She explains exceptions to the zero differential by an information gap resulting from recent influx of Negroes to metropolitan areas and an over-statement of the housing-income relationship due to doubling-up. This is not necessarily different from the central hypotheses of this paper; except that (1) forces are couched in terms of an information theory rather than an explicit market separation theory, and (2) the Negro-white rent differential would be zero in a steady state, something we are not prepared to say. For a further discussion of rent differentials see [13].

that segregation itself merely evidences market separation and not the economic pressures that dictate the nature of any price differentials that might arise. The insignificance of the segregation variable, and indeed its positive sign, tend to verify the theory rather than the intuition and concern.<sup>5</sup>

Finally, we would note that in none of the variants do welfare expenditures prove to be a significant determinant of rent differentials. Moreover, the positive relationship shown in all variants between welfare and the white-to-black rent ratio is counter to the sign it would be expected to have if welfare payments merely led to higher rents. The best one can conclude is that if such an effect is present, it is not strong enough to show up systematically in aggregate data.

#### Some Conclusions

Perhaps the most interesting observation that might be drawn from our analysis is that policies designed to reduce the rate of white migration out of center cities to suburbs may have adverse effects. White migration is alleged to increase problems with the declining tax base in center cities, the outward flow of industry, and their cumulative effect on urban blight, slum conditions, and violence.<sup>6</sup> In the absence of policies that would provide substantial

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<sup>5</sup>Because these results were surprising, we ran the same regressions using the unlogged index of segregation. In each case, the coefficient was positive and the T-ratio insignificant.

<sup>6</sup>For example see [2].

outlets for population migration from ghettos, policies of encouraging whites to remain in the center city may tend to increase economic differentials between the white and Negro areas of the city. Market separation of the type we are concerned with results from deep-seated social and cultural differences between the races and the historical background of subjugation of one race by another. Policies that cannot break down these barriers, that only serve to increase the pressure the white community places against expansion by the Negro community, can only result in increased economic differentials--particularly in rents--between the communities, and ultimately in greater conflict.

Our findings also imply that the observed relocation pattern of ghetto residents displaced under urban renewal programs may have been less than optimal. Ghetto dwellers tend to relocate no farther than to areas adjoining their old communities [11]. Here their containment by the surrounding white community continues unabated. The interests of those displaced might be better served if they were encouraged to migrate to outlying sections of the metropolitan area, to locations providing access to land which may ease the pressure of their rapidly expanding numbers.

Together with the Kain [8] and Wheeler [25] articles, this article offers further evidence that centralization of ghettos tends to create adverse living and working conditions for Negroes. And, while integration might be an admirable goal of public policy, the goal of decentralization of the Negro community and provision of

room for expansion, regardless of the impact on integration, may have higher priority.

Our findings, moreover, offer a potential explanation of the motives of the black separatist movement. Since the bulk of the resources, even in the ghetto areas, are controlled by whites, price and rent differentials tend to retard the rate of development of the black community. Simple segregation of the races does not necessarily lead to economic differentials, but containment and pressure do. What separatists are asking is not for integration, but for expansion. Our findings suggest that in the interest of their own development they may be looking in the right direction.

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## APPENDIX

Below is the list of 82 SMSA's for which data were included in the regression analysis:

1. Birmingham, Alabama
2. Mobile, Alabama
3. Fresno, California
4. Los Angeles, California
5. Sacramento, California
6. San Diego, California
7. San Francisco, California
8. San Jose, California
9. Denver, Colorado
10. Bridgeport, Connecticut
11. Hartford, Connecticut
12. New Haven, Connecticut
13. Wilmington, Delaware
14. Washington, D. C.
15. Jacksonville, Florida
16. Miami, Florida
17. Orlando, Florida
18. Tampa-St. Petersburg, Florida
19. Atlanta, Georgia
20. Chicago, Illinois
21. Peoria, Illinois
22. Gary, Indiana
23. Indianapolis, Indiana
24. Des Moines, Iowa
25. Wichita, Kansas
26. Louisville, Kentucky
27. New Orleans, Louisiana
28. Shreveport, Louisiana
29. Baltimore, Maryland
30. Boston, Massachusetts
31. Detroit, Michigan
32. Flint, Michigan
33. Grand Rapids, Michigan
34. Lansing, Michigan
35. Minneapolis-St. Paul, Minnesota
36. Kansas City, Missouri-Kansas
37. St. Louis, Missouri
38. Omaha, Nebraska
39. Jersey City, New Jersey
40. Newark, New Jersey
41. Patterson, New Jersey
42. Trenton, New Jersey
43. Albuquerque, New Mexico
44. Albany, New York
45. Buffalo, New York
46. New York, New York
47. Rochester, New York
48. Syracuse, New York
49. Charlotte, North Carolina
50. Akron, Ohio
51. Canton, Ohio
52. Cincinnati, Ohio
53. Cleveland, Ohio
54. Columbus, Ohio
55. Dayton, Ohio
56. Toledo, Ohio
57. Youngstown, Ohio
58. Oklahoma City, Oklahoma
59. Tulsa, Oklahoma
60. Portland, Oregon
61. Harrisburg, Pennsylvania
62. Philadelphia, Pennsylvania
63. Pittsburg, Pennsylvania
64. Providence, Rhode Island
65. Columbia, South Carolina
66. Chattanooga, Tennessee
67. Knoxville, Tennessee
68. Memphis, Tennessee
69. Nashville, Tennessee
70. Beaumont-Port Arthur, Texas
71. Dallas, Texas
72. El Paso, Texas
73. Fort Worth, Texas
74. Houston, Texas
75. San Antonio, Texas
76. Norfolk, Virginia
77. Richmond, Virginia
78. Seattle, Washington
79. Tacoma, Washington
80. Charleston, West Virginia
81. Huntington, West Virginia
82. Milwaukee, Wisconsin