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HOUSING SEGREGATION AND THE WAGES AND COMMUTES OF URBAN BLACKS: THE CASE OF ATLANTA FAST-FOOD RESTAURANT WORKERS

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FOREWORD

While the problems of cities have been ignored over the last decade, the concentration of poverty in core urban areas has grown and the location of jobs has increasingly shifted to suburban locations. Spatial mismatch is as real a problem now as it was when John Kain called it to our attention in the late 1960s. In this study of fast-food workers, perhaps the first analysis of this type to have adequate data to estimate intraurban wage gradients, Professor Keith Ihlanfeldt finds evidence that an excess supply of low skill labor in and near the ghetto has caused a reversal of the usual downward sloping wage gradient.

Professor Ihlanfeldt has written extensively on this subject. He is Professor of Economics and Senior Associate in the Policy Research Center. He wishes to thank the Research Program Committee of the College of the Business Administration at Georgia State University for its support. He is also grateful to Madelyn Young for providing data and Adam Chen for his research assistance. Helpful comments were provided by Julie Hotchkiss, Jorge Martinez, Mark Rider, and Sally Wallace.

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EXECUTIVE SUMMARY

One of the implications of the spatial mismatch hypothesis is that the intraurban wage gradient for lower-skilled workers may be positively sloped (i.e., wage rates will increase with distance from the city center). On the other hand, labor market discrimination theory predicts that wage discrimination against blacks will increase with distance from the city center.

This paper uses data from a sample of Atlanta fast-food restaurant workers to document the existence of positively sloped wage gradients. In addition, an analysis of commuting behavior shows that blacks are much less likely to work at higher-wage suburban restaurants, and must commute farther to obtain these jobs. Finally, evidence on discrimination suggests that consumer (but not employer or employee) prejudice affects the wages paid to black workers. However, as distance from the CBD increases, the positive wage gradient effect is found to strongly dominate the negative effect on black wages from greater consumer discrimination.

The impact of housing market discrimination and spatial mismatch on the average gross wages (standardized for human capital characteristics) received by employed Afro-American individuals is less clear-cut on both theoretical and empirical grounds. Theoretical models generally predict that wages will decrease with distance from the center, and while the empirical evidence is sparse, it generally supports this prediction. At the same time, there is both a respectable theoretical argument and some empirical evidence that housing market discrimination, and the massive central-city ghettos it has created, has resulted in an excess supply of low-skilled labor in and near the ghetto in many metropolitan areas. Theory suggests that this could cause a reversal, for low-skilled workers, in the usual downward-sloping wage gradient.

John Kain, 1992

HOUSING SEGREGATION AND THE WAGES AND COMMUTES OF URBAN BLACKS: THE CASE OF ATLANTA FAST-FOOD RESTAURANT WORKERS

Keith R. Ihlanfeldt*

I. INTRODUCTION

In recent years, a growing awareness of the worsening problems of inner-city poverty, growing unemployment, and declining earnings, particularly among minority youth, has rekindled interest in John Kain's (1968) spatial mismatch hypothesis (Wilson, 1987; Kasarda, 1989).[1] According to this hypothesis, the suburbanization of low-skill jobs and involuntary housing market segregation have acted together to create a surplus of workers relative to the number of available jobs in those inner-city neighborhoods where blacks are concentrated. This surplus will result in unemployment if wage rates are downwardly inflexible. It is also possible that some blacks who cannot find jobs in or near the ghetto are able to commute to more distant jobs, but they nevertheless suffer a welfare loss by earning a lower wage net of commuting costs. If wages are perfectly flexible, the surplus will be eliminated by wage rates falling to their equilibrium level. If the flexibility in wages is less than perfect, unemployment, lower wages, and longer commutes may simultaneously result from spatial mismatch. Hence, job decentralization may reduce the economic welfare of blacks by (1) making it more difficult to

* Professor of Economics and Senior Associate, Policy Research Center. The author wishes to thank the Research Program Committee of the College of the Business Administration at Georgia State University for its support. He is also grateful to Madelyn Young for providing data and Adam Chen for his research assistance. Helpful comments were provided by Julie Hotchkiss, Jorge Martinez, Mark Rider, and Sally Wallace.

find a job, (2) reducing wage rates in black relative to white areas, and (3) increasing commuting costs. These three possible effects are henceforth labelled Hypotheses One, Two, and Three.

Recent evidence (Ihlanfeldt and Sjoquist, 1990) lends considerable support to Hypothesis One and suggests that spatial mismatch plays an important role in explaining racial differences in youth employment rates. The evidence on Hypothesis Two is mixed, with some studies offering support (Vrooman and Greenfield, 1980; Reid, 1985; Straszheim, 1980b; Ihlanfeldt, 1988) and others little or no support (Harrison, 1972; Bell, 1974; Danziger and Weinstein, 1976; Price and Mills, 1985). Two different methodological approaches have been taken. The most popular approach has been to compare the wages of central city and suburban residents (Harrison, 1972; Bell, 1974; Vrooman and Greenfield, 1980; Price and Mills, 1985; Reid, 1985). The alternative approach has been to make average wage comparisons across large intra-urban work areas; for example, the central city and the suburban ring (Danziger and Weinstein, 1976; Straszheim, 1980a, 1980b; Ihlanfeldt, 1988).

As others have noted (Straszheim, 1980a; Holzer, 1991; Kain, 1992), the evidence obtained from the first approach is unreliable. Straszheim's (1980a, p. 26) critique of two of the early studies that have taken this approach is representative of this criticism:

> Again, these empirical tests do not address the issue of spatial wage or employment differentials since they are based on place of residence. The studies by Harrison and Bell tell more about how residential choices are made than about spatial differences in the labor market. The tendency for higher-income white households to seek more outlying residential locations is well known and is what Harrison's comparisons of white incomes within versus outside the central city reveal. It is somewhat surprising that he finds no difference in black incomes by place of residence. Most authors have suggested that higher-income blacks locate in the ring, a finding corroborated by this author's study of black incomes by place of residence in San Francisco. With respect to the spatial dimension to the labor market for blacks, appropriate analyses require an examination of wages and employment conditions by work site.

A shortcoming of the second methodological approach taken to investigate Hypothesis Two is that misleading results may be obtained due to spatial variation in wage rates within the large work areas. The preferred approach to the study of spatial wage variation within metropolitan areas, and the one recommended by Straszheim, is to estimate intra-urban wage gradients; i.e., the relationship between the wage rate and the distance the job is located from the CBD.[2]

Another drawback of the studies that have made wage comparisons across work areas (that also applies to the studies that have made wage comparisons by place of residence) is that the data used is now more than one decade, and generally more than two decades, old. Since there have been dramatic changes in the spatial distribution of jobs within metropolitan areas over the past two decades, intra-urban wage gradients are undoubtedly different today from those suggested by existing studies.

Evidence on Hypothesis Three, which is recent enough to be useful to policy-makers, is nonexistent.[3]

The paucity of reliable and up-to-date evidence on Hypotheses Two and Three is entirely attributable to data not being available that provide both the work and residential addresses of individual workers. This paper explores these hypotheses with recent data that does contain address information for a sample of fast-food restaurant employees who live and work in the Atlanta, Georgia metropolitan area. Fast-food restaurants are an interesting case to consider, since they are (1) an important source of employment for black youth and (2) growing rapidly in number within suburban areas (Charmer and Fraser, 1984).

Another important dimension of this paper is investigation of the hypothesis that blacks encounter greater discrimination at work sites located farther from the ghetto. Based upon a belief in the spatial mismatch hypothesis, a number of people have recommended that improved public transportation be provided to reverse commuters (Kasarda, 1989; Orfield, 1985; Hughes, 1989; Skinner, 1989). However, on its own, this strategy may not be effective, since all three types of discrimination (employer, employee, and consumer) identified by Becker (1971) may be more severe outside the central city. This paper provides evidence on each type of discrimination.

The results indicate that the wage rates of fast-food restaurant workers vary with distance and direction from the CBD. Positively sloped wage gradients are found, which is consistent with Hypothesis Two, since the Atlanta ghetto, like most ghettos, is located in proximity to the city center. The analysis of commuting behavior shows that blacks are much less likely to work at higher-wage suburban restaurants, and must commute farther to obtain these jobs. Finally, the evidence on discrimination suggests that only consumer discrimination affects the wages paid to black workers. However, as distance from the CBD increases, the positive wage gradient effect is found to strongly dominate the negative effect on wages from greater consumer discrimination.

The evidence presented in support of Hypotheses Two and Three is strongly consistent with previous findings in support of the spatial mismatch hypothesis (Ihlanfeldt and Sjoquist, 1990). Hence, once again the conclusion of Ellwood (1986) and Leonard (1986) that the spatial mismatch hypothesis is irrelevant to the labor market problems of inner city blacks can be rejected.

In the next section, the theory underlying the wage equations that are estimated is presented. In Section III the data are described. The commutes of black and white workers are

analyzed in Section IV. Section V describes the error components model that is used to estimate the wage equations. The results are presented in Section VI. A summary of the paper is contained in Section VII.

II. WAGE GRADIENTS AND LABOR MARKET DISCRIMINATION

The standard urban land use model concludes that wage rates must be higher at work sites closer to the CBD to compensate workers for the higher cost of close-in housing or for the higher transportation costs incurred by commuting from more distant residential locations where housing costs are lower. Formally, the condition that must be satisfied in order for workers to be indifferent to their work location is that the decline in the wage rate from working one mile farther from the CBD must be equal to the savings in commuting costs, i.e.,

$$\frac{\partial w(k)}{\partial k} = - 0.125t(k), \qquad (1)$$

where W is the hourly wage rate, k is the number of miles that the job is located from the CBD, and t is the cost of one mile of round-trip commuting, which is equal to out-of-pocket costs and the monetary equivalent of the marginal disutility of commuting. The multiplication of t(k) by 0.125 assumes that the cost of commuting is amortized over an eight-hour workday.

The urban land use model assumes that locational choices are unconstrained. Workers therefore maximize their utility by selecting a residential location that is farther from the CBD than their job location and commute inward toward the CBD. The assumption of unconstrained residential location may be untenable in the case of unskilled or low-skilled workers or in the case of black workers. These workers are frequently excluded from suburban neighborhoods as the result of fiscal zoning, the racial or class prejudice of housing suppliers, and the necessity for

lower-income households to purchase less expensive, filtered-down housing within the central city. If these exclusions are sufficiently strong, the basic commuting direction will be outward rather than inward. In this case, the right-hand side of equation (1) is reversed in sign, implying that wage rates will rise with increasing distance from the CBD. As documented below, on the north side of Atlanta, the basic commuting direction of fast-food restaurant employees is outward from the CBD. A positively sloped wage gradient is therefore expected.

The wage gradient may be less steep for black in comparison to white workers if labor market discrimination increases with distance from the CBD. To derive testable implications regarding the possible effects of discrimination on black wage rates, a simple model is developed that draws upon Becker (1971). Becker hypothesized that (1) prejudiced white employers act as if the wage paid to blacks consists of the actual monetary cost plus the disutility in money terms incurred by the employer from contact with black employees, (2) prejudiced white consumers act as if the price they pay consists of the actual price plus the disutility in money terms they experience by purchasing from blacks, and (3) prejudiced white employees act as if the wage they receive is equal to the actual wage minus the disutility in money terms that they experience from working with blacks. A profit function incorporating these hypotheses can be specified as follows:

$$\pi = Bp + W\ (p-d_c) - L_B\ (E_B+d_m) - L_W\ (E_W+d_e) - K, \qquad (2)$$

where B,W = units of output purchased by black and white consumers,

d_c, d_m, d_e = the disutility in money terms that prejudiced white consumers, white employers, and white employees experience as the result of the firm hiring black workers,

L_B, L_W = the number of black and white workers,

p, E_W, E_B = price and white earnings in the absence of prejudice and black earnings,

K = costs of nonlabor inputs.

The disutility whites incur from the presence of black workers is assumed to increase with the proportion of the firm's workers who are black (r). This is a reasonable assumption, since whether the white is an employer, an employee, or a consumer, the degree of his (her) interaction with blacks will depend on the racial composition of the firms's workforce.[4] Equation (2) also assumes that whites have alternative choices that enable them to avoid the disutility that results from the firm hiring black workers. Whites must therefore be compensated for their disutility. That is, the actual price paid by whites is $(p\text{-}d_c)$ and the actual wage paid to whites is $(E_W + d_e)$.[5] In the case of a prejudiced employer, his total cost from hiring a black worker is $(E_b + d_m)$, and therefore he will hire a black worker only if $E_B \leq E_W - d_m$.

The maximization of (2) with respect to L_B yields the following first-order condition:

$$p((\partial B/\partial L_B) + (\partial W/\partial L_B)) - (\partial W/\partial L_B)d_c - W(\partial d_c/\partial r)(\partial r/\partial L_B) \qquad (3)$$
$$- L_W(\partial d_c/\partial r)(\partial r/\partial L_B) - L_B(\partial d_m/\partial r)(\partial r/\partial L_B)$$
$$- d_m = E_B.$$

If all types of prejudice are absent, only the first term on the left-hand side remains, which indicates that the worker will be paid his (her) marginal revenue product. If white consumers are prejudiced against black workers, however, the second and third terms on the left-hand side of (3) are negative, which implies that the black worker will be paid less the greater the proportion of the firms's customers who are white and the larger the number of white customers. The intuition here is straightforward. The second term indicates that the units of

output produced by the marginal black worker that are sold to white customers are sold at a discount. The black worker must compensate the employer for this loss. The third term indicates that the marginal black worker increases d_e, which means that each white customer must receive some additional compensation, which further reduces E_B.

If white workers are prejudiced against black workers, the fourth term on the left-hand side of (3) is negative, which implies that E_B will be inversely related to the number of whites working for the firm. The logic of this result is that an increase in L_B will increase d_e, which forces the firm to pay each white worker more.

If employer prejudice exists, the final two terms on the left-hand side of (3) are negative. The first of these terms indicates that hiring an additional black worker will increase d_m, which means that the employer will experience an increase in his (her) disutility from dealing with each of the firm's black workers. E_B must fall to offset this increase in the employer's costs. The last term on the left-hand side of (3), d_m, reflects the employer's disutility from hiring the marginal black worker.

Since firms at greater distances from the CBD have a higher proportion and a greater number of white customers and employ more white workers, the above analysis suggests that consumer and employee discrimination against black workers are greater farther from the CBD. However, the relationship between employer discrimination and distance is ambiguous. Since the proportion of the firm's workers who are black is smaller farther from the CBD, so is d_m. This implies that blacks encounter less discrimination by white employers at greater distances. On the other hand, as distance increases employers are more likely to be white than black, which creates the possibility that on net employer discrimination may be greater farther from the CBD.

III. DATA

Data for this study come from a sample of 102 hamburger fast-food restaurants located in the Atlanta metropolitan area. The managers and hourly employees of these restaurants were surveyed in 1989. The manager of each restaurant was interviewed in person and employees were asked to complete a questionnaire. The overall employee response rate was 47 percent. The number of blacks and whites in the employee sample equalled 914 and 315, respectively.[6] Useable residential address information was provided by 860 of the blacks and 293 of the whites. Travel distances to work were computed by first identifying the census tract of each restaurant and that of each employee's residence. Distances in miles between the centroids of census tracts were then used to approximate the worker's commute. The census tract distances were also used to estimate the distance the worker lived from Five Points, which is the center of Atlanta's CBD.

The sample of restaurants is not representative of all of Atlanta's hamburger establishments. First, not all restaurant chains are included. There are five major chains located in Atlanta: Hardee's, Wendy's, Burger King, Krystal, and McDonald's. No McDonald's restaurants are included in the sample, because the company declined to cooperate. In addition, permission could not be obtained to survey company-owned Burger King restaurants. Franchised Burger King restaurants, however, are included in the sample. Second, for reasons of cost containment, restaurants located in the outer suburbs (i.e., beyond 20 miles from the CBD center) were not sampled and those located in the inner suburbs were undersampled.

Secondary data sources included a market research firm and city and suburban directories. The market research firm provided information on the average income of households living

within a three-mile radius of each restaurant and the directories were used to determine the number of competing restaurants within the same radius.[7]

IV. ANALYSIS OF COMMUTING PATTERNS

Table 1 presents evidence on the wage rates and commutes of workers employed by restaurants located various distances from the center of the CBD. The top half of the table is for restaurants located north of the center and the bottom half is for restaurants that are south of the center. It is important to stratify the sample by direction from the center, since the north side of Atlanta has experienced markedly greater economic growth than has the south side.[8] In addition, all of Atlanta's suburban black enclaves are found on the south side.

Column (1) reports the average starting wage across restaurants located within five-mile intervals of the CBD center.[9] For north-side restaurants, the starting wage systematically increases with distance from the CBD. The restaurants within 5 miles of the center pay on average $3.79, while the restaurants located within the greatest distance interval (15 to 20 miles from the center) pay 22 percent more, or $4.61. In contrast to the strong relationship between distance and wages on the north side, the starting wage rates paid by south-side restaurants are invariant with respect to distance from the center.

The starting wage rates listed in Column (1) were reported by the store managers. The third column of Table 1 reports the mean wages of workers employed by restaurants located within each of the distance intervals. These averages are based on the wage rates reported by workers. The spatial pattern in wage rates is essentially the same for both starting and mean wage rates.

The racial composition of the workforce within each distance interval is reported in Column (5). The percentage of workers who are black declines with distance on both the north and south sides of Atlanta. Of particular significance are the findings for the north side. Blacks are overrepresented at closer-in restaurants that pay low wage rates and underrepresented at more distant restaurants that pay high wage rates. If blacks and whites were uniformly distributed across restaurants, 74 percent of the workers at each restaurant would be black. For north-side restaurants located within 5 miles of the CBD center, where the mean starting wage is $3.79, 90 percent of the workers are black. In contrast, for restaurants 15 to 20 miles out, where the mean starting wage is $4.61, only 32 percent of the workers are black.

The average commutes of blacks and whites working within each distance interval are in Columns (6) and (7), respectively. A comparison of these columns reveals that blacks must travel farther than whites to work at the higher-wage restaurants on the north side of the city. For restaurants 10 to 15 miles from the center, blacks must travel 1.7 miles, or 67 percent farther than whites. For the most distant restaurants, blacks must travel .9 miles, or 23 percent farther than whites.

The percentages of workers who made an excessive commute, defined as 10 miles or more one-way, were also computed (see Columns 8 and 9). Excessive commutes are made by 6 percent and 21 percent of the blacks working 10 to 15 miles and 15 to 20 miles north of the center, respectively. The corresponding percentages for whites are 0 percent and 12 percent.

To study the direction of commuting, workers are categorized as in-commuters, out-commuters, or non-commuters. An in-commuter is defined as someone who lives in a census tract that is located farther from the CBD center then the census tract where he (she) works. An

out-commuter is someone whose residential census tract is located closer to the center than his (her) work census tract. Non-commuters live and work within the same census tract.

Among the workers employed by north-side Atlanta restaurants, 58 percent of those who commute are out-commuters. On the south side, the corresponding percentage is only 44 percent. These percentages suggest that on net fast-food restaurants workers out-commute to jobs on the north side and in-commute to jobs on the south side.

More detail on the direction of commuting is provided in Table 2, which provides a breakdown by race and distance interval. North-side restaurants located more than 10 (5) miles from the center hire more out-commuting than in-commuting whites (blacks). The tendency for blacks to out-commute is stronger than for whites. This is most dramatically illustrated by workers employed by restaurants located within the greatest distance interval. The percentage of blacks who out-commute is 65 percent, while no blacks are found to in-commute. The percentage of whites who out-commute is 39 percent, and the percentage who in-commute is 22 percent. The observed racial differences in the propensity to out- and in-commute suggest that residential constraints are more binding for black, in comparison to white, fast-food workers.

Whites working at south-side restaurants on net commute-in, regardless of the distance the restaurant is located from the center. For blacks the results are mixed, with the net commuting direction reversing with each successive distance interval. Nevertheless, within each distance interval, blacks are much less likely than whites to be in-commuters, which lends further support to the contention that the residential choices of blacks are more severely constrained.

In summary, the commuting data indicate that blacks are much less likely than whites to work at the higher-wage suburban restaurants in Atlanta and must travel farther than whites to

get to these jobs. In addition, there is a considerable racial disparity in the direction of commutes, which shows that blacks more frequently reverse-commute from closer-in locations where the price of housing services is higher.

V. ESTIMATED WAGE EQUATIONS

To test for the existence of wage gradients and labor market discrimination against blacks, wage rate equations of the following form are estimated:

$$\ln(W_{ij}) = X_{ij}\beta + DN_i\gamma_1 + DS_i\gamma_2 + Z_{ij}\delta + \mu_{ij}\,, \qquad (4)$$
$$i = (1,...,n);\ j = (1,...,m_i).$$

W_{ij} is the hourly wage rate for worker j at restaurant i. X_{ij} is a vector of control variables. DN_i is the airline distance in miles from the center of the CBD to a restaurant located on the north side of the city. For south-side restaurants, DN_i is equal to zero. DS_i is the counterpart of DN_i for south-side restaurants. Z_{ij} is a vector of variables, suggested by equation (3), which tests for the presence of labor market discrimination. The error term is μ_{ij}. All of the independent variables are defined in Table 3.

The control variables (X_{ij}) include characteristics of the individual and of the restaurant. The individual characteristics represent the standard set of productivity variables typically included in well-specified earnings equations: age, experience, education, martial status, gender, and hours worked.[10] The variables that vary across establishments are: chain affiliation, franchised versus company-owned, average weekly sales, proximity to mass transit, number of competing restaurants within a 3-mile radius, and average household income within a 3-mile radius. Chain affiliation is included since different chains may have different compensation

policies. The type of ownership of the restaurant is included since Krueger (1990) has shown that wages are higher in company-owned establishments, all else the same. His results are consistent with the hypothesis that because of principal-agent relationships employees are monitored less closely in company-owned than in franchisee-owned establishments. The monitoring efficiency wage model therefore predicts that wages would be higher in company-owned establishments. Average weekly sales may be positively correlated with wage rates if managers engage in rent-sharing with their employees and if sales serve as a proxy for profits. Proximity to mass transit lowers the transportation costs of workers and therefore is expected to lower the wage the restaurant must pay to attract workers. The number of competing restaurants and average household income are included to proxy the demand for labor and supply of labor in the immediate vicinity of the restaurant.

The discrimination variables include the percentage of the restaurant's customers who are white (consumer discrimination), the number of white employees working at the restaurant (employee discrimination), and the race of the manager and the number of blacks working at the restaurant (employer discrimination).[11] The effect of the number of black workers is measured separately for black and white managers.

Because the data set contains observations on multiple employees from the same establishment ($m_i > 1$), it is reasonable to assume that μ_{ij} has the following properties:

$$\mu_{ij} = \alpha_i + \varepsilon_{ij}$$
$$E(\alpha_i) = E(\varepsilon_{ij}) = E(\alpha_i \varepsilon_{ij}) = 0$$
$$E(\alpha_i^2) = \sigma_\alpha^2 \text{ and } E(\varepsilon_{ij}) = \sigma_\varepsilon^2 ,$$

where α_i is a random (iid) establishment effect and ε_{ij} is a random (iid) individual effect. Because μ_{ij} is not independent, the OLS estimator yields unbiased but inefficient estimates of the slope coefficients. More importantly, the usual standard errors and test statistics for the slope coefficients can be seriously biased (Moulton, 1990). The random effects model (also known as the error components model), however, is asymptotically efficient under the above assumptions. This model involves first obtaining estimates of σ_α^2 and σ_ε^2 and then using the general least squares estimator. There are a large number of estimators available that yield consistent estimates of the variance components. The one selected is the maximum likelihood estimator, which is recommended by Moulton (1989) when the number of groups (i.e., establishments) is large.

VI. RESULTS

The results from estimating the wage equations are reported in Table 4. Columns (1) through (4) are the results obtained for black workers with different inclusions of the discrimination variables. Results for white workers are in Columns (5) and (6).

Across all of the equations estimated for blacks, the estimated coefficients on distance north (DN) are statistically significant at the one percent level and indicate that black wage rates increase about .085 percent per mile. A positive wage gradient is therefore found to exist on the north side of Atlanta and the distance effect is substantial. On the south side, the wage gradient also has a positive slope, but the estimated distance coefficients are small and not significantly different from zero.

With only a few exceptions, the control variables in the black equations perform as expected. Among the establishment effects, wages are found to be lower for workers at restaurants that are located near MARTA and that are franchise-owned. Wages are higher if in

the immediate vicinity of the restaurant there are more competing restaurants or if average household income is higher. Weekly sales have a positive effect on wage rates, but the effect is seldom significant. The estimated coefficients on the variables that describe the individual worker indicate that age, experience, education, hours, and married all have positive and statistically significant effects.

Column (1) reports the results obtained from including the full set of discrimination variables. Among these variables the only one that is statistically significant (at the conventional five percent level) is the percentage of the restaurant's customers who are white. The size of this coefficient indicates that a 10-percentage-point increase in percent white would reduce black wages by about one percent. This same result is obtained if all of the other discrimination variables (see Column 2) are dropped from the estimated equation.

Column (3) reports the results obtained from allowing the percent white effect to vary with the racial composition of the firm's workforce. Separate effects are estimated for workers employed by restaurants whose workforce is 50 percent or less black (WCUST%1), greater than 50 percent but less than 99 percent black (WCUST%2), and greater than or equal to 99 percent black (WCUST%3). Since white consumers are assumed to experience greater prejudice-related disutility at restaurants with a higher percentage of black workers, the expectation is that the absolute value of the estimated coefficient on WCUST%1 will be larger than on WCUST%2, and that the coefficient on WCUST%3 will exceed that on WCUST%2. The estimated coefficients on WCUST%1, WCUST%2, and WCUST%3 are -.0006, -.0009, and -.0006, respectively. As expected, the absolute value of the estimated coefficient on WCUST%2 is larger than on WCUST%1. However, the coefficient on WCUST%3 is smaller than on WCUST%2. An

explanation for the latter result is based on the fact that, in comparison to other locations within the metro area, the restaurants located in downtown Atlanta typically have all (or nearly all) black workers. Hence, whites who work downtown represent a captive clientele, in that they are less able to avoid interaction with black workers by selecting an alternative restaurant. Downtown restaurants can therefore retain their white customers by offering less compensation, even if whites experience the highest levels of disutility from patronizing these establishments.

Since the percentage of restaurants' customers who are white increases with distance from the CBD center, it is of interest to determine the net effect that distance has on black wage rates. Column (4) reports the results obtained from estimating an equation that includes only the distance and control variables. As expected, the coefficient on distance north decreases (from .0085 to .0077), but the positive wage gradient effect clearly dominates the negative effect of greater consumer discrimination at greater distances.

Based on the assumption that blacks may be prejudiced against white workers, the first equation estimated for whites includes the converse of each of the discrimination variables defined for blacks (see Column 5). That is, the percentage of white consumers is replaced by the percentage of black consumers, the number of white workers is replaced by the number of black workers, etc. None of these variables is statistically significant with the correct sign. In the second equation (Column 6) all of the discrimination variables are dropped. The estimated coefficients on distance north indicate that white wage rates increase one percent per mile, which suggests a wage gradient that is slightly more steeply sloped than the one estimated for blacks. As was true for blacks, the estimated coefficients on distance south are not significantly different from zero.

In summary, the results suggest that the only type of discrimination that affects the earnings of black fast-food restaurant workers arises from the prejudice of white consumers. The magnitude of the effect is small -- a 10-point increase in the percentage of the restaurant's customers who are white results in black wages declining by one percent. Consumer discrimination increases with distance from the city center. Estimates of the wage gradient that would exist in the absence of discrimination are obtained by running regressions for blacks that include discrimination variables and by running regressions for whites. These estimates are consistent with one another. When they are compared to the estimate of the net effect that distance has on black wage rates, the conclusion is that the wage gradient effect strongly dominates the consumer discrimination effect, which results in black and white wage rates rising with distance by about the same amount.

VII. CONCLUSIONS

This study is the first to have available the requisite data to estimate intra-urban wage gradients for low-skilled workers. The results show that there exists a positive wage gradient of roughly equal magnitude for blacks and whites working at fast-food restaurants on the north side of Atlanta. The gradient effect on wages is found to be economically significant, with the wage rate increasing about one percent per mile. This evidence confirms Kain's expectation that an excess supply of low-skilled labor in and near the ghetto has caused a reversal in the usual downward-sloping wage gradient. Support is therefore provided for the spatial mismatch hypothesis. Additional support for the hypothesis is provided by our analysis of commuting patterns, which shows that, in comparison to whites, blacks are less likely to work at higher-

wage suburban restaurants, must travel farther to get to these jobs, and are more frequently out-commuters than in-commuters.

The results also suggest that wage discrimination against blacks, whether arising from consumer, employee, or employer prejudice, is a relatively unimportant phenomenon in the fast-food industry. Only consumer discrimination is found to exist, and its spatial effect is trivial in comparison to the gradient effect. Of course, our results have no bearing, one way or another, on the existence of hiring discrimination. Nevertheless, they lend support to the policy prescription that jobs in growing suburban areas should be made more accessible to inner-city blacks.

A final implication of this paper, that goes beyond the spatial mismatch hypothesis, is that estimation of wage equations, regardless of the author's objective, should explicitly acknowledge the existence of intra-urban wage gradients. Spatial variation in wage rates within metropolitan areas is commonly ignored and implicitly treated as just another part of the residual. This can lead to biased results if the work locations of different groups of workers, as shown here, are not randomly distributed within urban areas.

Regarding future research, it is obviously important to conduct analyses of spatial variation in wage rates for other metropolitan areas and for other occupation/industry groups. With the growth in social pathologies within inner cities, the operation of urban labor markets warrants more of a research priority. This work, however, will require that new surveys be conducted providing the workplace and residence addresses of individual workers. The continuing use of government-collected data that fail to provide this information is discouraged.

ENDNOTES

1. This interest is illustrated by the fact that there have been six recent reviews of the spatial mismatch literature (Wheeler, 1990; Jencks and Mayer, 1990; Moss and Tilly, 1991; Holzer, 1991; Kain, 1992; Ihlanfeldt, forthcoming).

2. There is one study (Ihlanfeldt, 1991) that provides some evidence on wage gradients for black and white workers broken down by occupational class. Wage equations are estimated using data from the 1980 Public Use Sample (PUS) for Philadelphia, Detroit, and Boston. For each of these metropolitan areas the PUS identifies at least 15 work areas. Work distance from the CBD is estimated by assigning each worker the airline distance between the CBD and the center of the largest city or town within the work area that his (her) job is located. Downward sloping wage gradients are observed for skilled white workers in all three MSAs. For unskilled white workers gradients tend to be flat. Wage equations for blacks are estimated for only Philadelphia and Detroit. In most cases, estimated wage gradients are flat for both skilled and unskilled workers. The present study improves upon this earlier work by exploiting a superior data base.

3. Based on 1965 data that were representative of male household heads living in the metropolitan United States, Greytak (1974) found that for SMSAs larger than 3 million in population nonwhites commute 6 miles farther than whites. No statistically significant racial differences were found for smaller SMSAs. Based on 1970 Chicago Area Transportation Survey data and 1975 Annual Housing Survey data, Ellwood (1986) concluded that low-skilled blacks travel farther to work than low-skilled whites.

4. It is assumed that customer disutility cannot be mitigated by segregating blacks in jobs that do not involve consumer contact. In the case of fast-food restaurants, there are two principal job tasks -- customer service (e.g., taking orders, host or hostess in dining area, etc.) and food preparation. If food preparation was out of the view of customers, then blacks would be expected to have a higher likelihood of performing this task. However, since this is generally not the case in a fast-food restaurant, it is unclear whether employers can mitigate the disutility of prejudiced white customers by segregating whites and blacks into front of the store and back of the store duties. In addition, the interviews with managers indicated it was company policy to rotate workers between jobs tasks.

5. While it is reasonable that white workers may receive a premium for working with blacks, it is more difficult to envision how whites would pay lower prices than blacks at the same restaurant. This, however, can be accomplished by targeting sales to white customers, lowering prices during those times that whites are more likely to purchase (e.g., lunch-time specials for white suburbanites working within the central city), or lowering prices on those menu items preferred by whites. Furthermore, the assumption that whites and blacks pay different food prices is a simplifying assumption. All that is really required by the model is that the restaurant that hires blacks incurs a cost to retain its white customers.

6. The employee sample also included 130 workers who were neither black nor white.

7. The selection of a 3-mile radius was based upon pre-sample interviews with restaurant managers, who were asked to give their best estimate of the average one-way commute of their employees.

8. The Atlanta Regional Commission has divided the five counties within which the sample of restaurants is located into subcounty planning areas. Using their 1980 and 1990 employment estimates for these areas, it is possible to compute employment growth rates for the north and south sides of Atlanta. Total employment increased 76 percent over the decade on the north side, but only 28 percent on the south side.

9. Mean starting wage is the average of managers' answers to the following question: A new employee has just graduated from high school, has no previous work experience in fast food, and will work over the lunch hour Monday-Friday. What is the starting wage this new employee receives?

10. A number of variables known to affect earnings (e.g., achievement motivation) are not provided by the data. This may bias estimates of the wage gradient if workers possessing more of a particular unobservable earnings characteristic tend to select jobs that are located at only certain distances from the CBD. Some evidence on this issue has been provided by Ihlanfeldt (1988), which suggests that this type of potential bias is not a major concern. 1980 Public Use Sample data for the Atlanta metropolitan area were employed to test for selectivity bias using the two-step procedure outlined by Heckman (1976). In the first step, maximum likelihood probit models were estimated for each race, where the dependent variable equaled one if the individual worked in the central city and zero if the work location was the suburbs. In the second step, the sample was stratified by race, occupational class, and work location to form 12 subsamples. For each subsample, a separate earnings equation was estimated, which included a selectivity variable predicted from the probit results. If the estimated coefficient on this variable is not significantly different from zero, the null hypothesis that sample selection is an unimportant phenomenon can be accepted. In all of the regressions estimated for workers in low-wage occupations, the results indicated that self-selection of work location is an unimportant phenomenon.

11. The theoretical model suggests that increases in either the number of the restaurant's customers who are white or the percentage of the restaurant's customers who are white will reduce black wage rates if whites are prejudiced against black workers. Since there was no way to obtain reliable information on the number of white customers, only the percentage of white customers, as estimated by the store manager, is included in estimated wage equations. If both variables were available, high collinearity between them would likely have precluded estimates of their independent effects.

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TABLES

TABLE 1

Mean Wage Rates and Commutes of Fast-Food Restaurant Workers
in Atlanta by Distance from the Center of the CBD

Miles from Center	(1) Mean[1] Starting Wage	(2) Number of Restaurants	(3) Mean[2] Wage	(4) Number of Workers	(5) Percent Black Workers	(6) Mean Commute Blacks	(7) Mean[3] Commute Whites	(8) Excessive[4] Commute Blacks	(9) Excessive Commute Whites
North									
0-5	$3.79	13	$4.16	175	89.6	2.58m	3.29m	1%	0%
5-10	$3.91	22	$4.20	288	88.4	3.32m	2.71m	1%	0%
10-15	$4.35	19	$4.79	249	66.8	4.27m	2.56m	6%	0%
15-20	$4.61	11	$5.05	123	32.3	4.77m	3.83m	21%	12%
South									
0-5	$3.82	3	$3.96	26	93.0	1.91m	....	0%	....
5-10	$3.73	15	$4.03	159	75.0	2.51m	1.56m	1%	0%
10-15	$3.87	14	$4.19	244	56.0	2.13m	2.33m	0%	1%
15-20	$3.81	5	$4.20	95	51.0	2.48m	1.91m	0%	3%

[1] Mean starting wage in the average of managers' answers to the following question: A new employee has just graduated from high school, has no previous work experience in fast food, and will work over the lunch hour Monday-Friday. What is the starting wage this new employee receives?

[2] Mean wage is the average wage of all hourly employees working within the distance interval.

[3] Sample was too small to compute a reliable mean for whites working 0-5 miles south from the center.

[4] An excessive commute is defined as 10 miles or more, one-way.

TABLE 2

Commuting Direction of Fast-Food Restaurant Workers in Atlanta**

Distance in Miles Restaurant Is Located from the Center	Percent of Whites Commuting In	Percent of Whites Commuting Out	Percent of Blacks Commuting In	Percent of Blacks Commuting Out
North				
0-5	47	47	69	25
5-10	55	40	36	54
10-15	37	49	16	71
15-20	22	39	0	65
South				
0-5	...	...	90	10
5-10	60	20	26	58
10-15	65	28	48	32
15-20	47	16	34	43

** An in-commuter is defined as a worker who lives in a census tract that is located farther from the CBD center then the census tract he works in. An out-commuter is a worker whose residential census tract is located closer to the CBD center than his work census tract. A worker who works and lives in the same census tract is defined as a non-commuter.

TABLE 3

Explanatory Variables Entering Wage Equations

Distance Variables	
DN	Airline distance between a north-side restaurant and the center of the CBD. DN equals zero for south-side restaurants.
DS	Airline distance between a south-side restaurant and the Center of the CBD. DS equals zero for north-side restaurants.
Establishment Characteristics	
CHAIN1, CHAIN2, CHAIN3	Dummy variables representing chain affiliation.
FRAN	Equals one if franchisee-owned, zero if company-owned.
SALESWK	Sales ($1000) per week.
MARTA	Equals one if the restaurant is within two blocks of a MARTA bus or train line, and zero otherwise.
AVGINC	Average income of households ($1000) living within a three-mile radius of restaurant.
COMPET	Number of competing fast-food restaurants of all types located within a three-mile radius of restaurant.
Individual Characteristics	
EDUC2	Completed high school, yes = 1.
EDUC3	Some college, yes = 1.
EDUC4	Associate degree, yes =1.
EDUC5	Bachelor's degree, yes = 1.
EDUC6	Some technical school, yes =1.
EDUC7	Completed technical school, yes = 1.
AGE	Years old.
GIRL	Female, yes = 1.
MAR	Married, yes = 1.
EXP	Months working at present restaurant.
EX6	Experience of 6 months or less at another restaurant, yes = 1.
EX12	Experience of 6 to 12 months at another restaurant, yes = 1.
EX18	Experience of 12 to 18 months at another restaurant, yes = 1.
EX24	Experience of 18 to 24 months at another restaurant, yes = 1.
EXX	Experience of more than 24 months at another restaurant, yes = 1.
HOURS1	Average number of hours worked per week >25 and <35.
HOURS2	Average number of hours worked be week >15 and <25.
HOURS3	Average number of hours worked per week <15.
Discrimination Variables	
WCUST%	Manager's estimate of the percentage of the restaurant's customers who are white.
WWORK	Number of white hourly employees.
WMGR	Manager is white, yes = 1.
BWORKB	Equals number of black hourly employees if manager is black, otherwise zero.
BWORKW	Equals number of black hourly employees if manager is white, otherwise zero.
WCUST%1	Equals WCUST% if the percentage of the workforce who are black is 50 or less, otherwise zero.
WCUST%2	Equals WCUST% if the percentage black is greater than 50 but less than 99, otherwise zero.
WCUST%3	Equals WCUST% if the percentage black is greater than or equal to 99, otherwise zero.

TABLE 4

Wage Equation Results

	Dependent Variable: Log Hourly Wage Coefficient (t-statistic)					
	Blacks				Whites	
	(1)	(2)	(3)	(4)	(5)[a]	(6)
DN	.0082 (3.64)	.0085 (3.92)	.0088 (3.91)	.0077 (3.48)	.0102 (3.48)	.0097 (3.63)
DS	.0025 (1.08)	.0026 (1.16)	.0031 (1.31)	.0016 (.68)	.0013 (.42)	.0008 (.25)
CHAIN1	.0481 (1.77)	.0402 (1.53)	.0404 (1.55)	.0279 (1.04)	.0437 (1.15)	.0225 (.60)
CHAIN2	.0712 (2.68)	.0609 (2.44)	.0574 (2.29)	.0456 (1.81)	.0976 (2.58)	.0683 (1.87)
CHAIN3	-.0231 (.85)	-.0259 (.97)	-.0266 (1.01)	-.0305 (1.11)	.0177 (.45)	-.0126 (.32)
FRAN	-.0267 (1.29)	-.0276 (1.37)	-.0244 (1.23)	-.0324 (1.55)	-.0266 (.90)	-.0556 (1.96)
SALESWK	.0002 (1.34)	.0002 (1.55)	.0002 (1.57)	.0003 (2.00)	-.0003 (.80)	.0001 (.72)
MARTA	-.0380 (2.27)	-.0366 (2.58)	-.0335 (2.32)	-.0356 (2.42)	-.0240 (1.37)	-.0354 (2.26)
AVGINC	.0029 (3.82)	.0027 (3.55)	.0030 (3.96)	.0020 (2.86)	.0011 (.99)	.0001 (.81)
COMPET	.0008 (2.30)	.0007 (2.17)	.0008 (2.46)	.0005 (1.42)	-.0001 (.01)	.0001 (.31)
EDUC2	.0362 (5.14)	.0359 (5.11)	.0355 (5.06)	.0352 (5.01)	.0236 (1.82)	.0242 (1.84)

[a] The discrimination variables entering the equation estimated for whites are the converse of each of those included for blacks.

	Dependent Variable: Log Hourly Wage Coefficient (t-statistic)					
	Blacks				Whites	
EDUC3	.0435 (4.86)	.0432 (4.82)	.0422 (4.71)	.0433 (4.83)	.0300 (1.60)	.0282 (1.50)
EDUC4	.0646 (4.19)	.0640 (4.16)	.0644 (4.19)	.0634 (4.11)	.0614 (1.88)	.0493 (1.50)
EDUC5	.0517 (2.12)	.0526 (2.26)	.0501 (2.16)	.0512 (2.20)	-.0017 (.04)	-.0060 (.13)
EDUC6	.0295 (2.30)	.0296 (2.31)	.0284 (2.21)	.0286 (2.23)	.0201 (.66)	.0053 (.17)
EDUC7	.0390 (2.49)	.0391 (2.50)	.0380 (2.43)	.0392 (2.51)	.0492 (1.22)	.0525 (1.29)
AGE	.0013 (2.81)	.0013 (2.85)	.0014 (2.93)	.0013 (2.76)	.0014 (2.76)	.0013 (2.57)
GIRL	-.0007 (.13)	-.0006 (.11)	-.0009 (.16)	-.0009 (.15)	-.0017 (.14)	.0045 (.38)
MAR	.0269 (2.96)	.0272 (3.00)	.0278 (3.07)	.0277 (3.06)	.0416 (3.25)	.0372 (2.89)
EXP	.0022 (11.54)	.0022 (11.50)	.0022 (11.27)	.0022 (11.46)	.0015 (6.90)	.0016 (7.38)
EX6	.0164 (2.55)	.0164 (2.54)	.0167 (2.60)	.0163 (2.53)	.0150 (1.21)	.0153 (1.26)
EX12	.0197 (2.48)	.0198 (2.51)	.0200 (2.51)	.0192 (2.43)	.0198 (1.11)	.0226 (1.26)
EX18	.0166 (1.30)	.0165 (1.30)	.0170 (1.34)	.0170 (1.34)	-.0161 (.63)	-.0069 (.27)
EX24	.0591 (4.34)	.0592 (4.33)	.0585 (4.30)	.0580 (4.24)	.0628 (2.80)	.0586 (2.58)
EXX	.0317 (2.97)	.0319 (2.99)	.0318 (2.98)	.0311 (2.91)	.0463 (2.37)	.0502 (2.56)
HOURS1	-.0222 (3.04)	-.0222 (3.04)	-.0223 (3.07)	-.0230 (3.15)	-.0198 (1.48)	-.0202 (1.49)

	Dependent Variable: Log Hourly Wage Coefficient (t-statistic)					
	Blacks				Whites	
HOURS2	-.0352 (4.62)	-.0352 (4.62)	-.0348 (4.57)	-.0230 (3.15)	-.0604 (4.32)	-.0598 (4.22)
HOURS3	-.0484 (5.01)	-.0489 (5.07)	-.0490 (5.09)	-.0356 (4.67)	-.0482 (2.26)	-.0479 (2.24)
WCUST%	-.0008 (2.51)	-.0008 (2.60)			-.0019 (1.32)	
WWORK	.0003 (.23)				-.0014 (1.01)	
WMGR	.0374 (1.11)				.0447 (1.79)	
BWORKB	.0011 (.89)				.0023 (1.19)	
BWORKW	-.0006 (.54)				.0012 (.54)	
WCUST%1			-.0006 (1.81)			
WCUST%2			-.0009 (3.03)			
WCUST%3			-.0006 (1.57)			
CONSTANT	1.151 (19.52)	1.193 (23.71)	1.1708 (23.20)	1.1916 (22.92)	1.2680 (14.22)	1.2771 (18.29)
LOGLIKE	975	974	976	970	319	312
OB.	914	914	914	914	315	315

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