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The Spatial Mismatch Hypothesis and Black Youth Joblessness: Evidence from the San Francisco Bay Area

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Abstract

This paper presents an employment-based measure of intra-metropolitan accessibility to employment opportunities that provides strong evidence supporting the spatial mismatch hypothesis. The measure is based on intra-metropolitan variation in net employment growth rather than spatial variation in employment levels. The principal spatial disadvantage suffered by black male youths is their residence in areas of weak or negative employment growth. In pooled employment regressions, differential accessibility explains 30 to 50 percent of the neighborhood employment rate differential between white and black male Bay Area youths. In separate employment regressions by race, approximately one-fifth of the differential is attributable to differential access.

1. Introduction

In popular discourse, the lower employment rates and earnings of African-American youths are often attributed to their geographic and social isolation in ailing inner-city neighborhoods. Abandoned by blue-collar employers and geographically trapped by housing discrimination and suburban land use policy, these workers are victims of what has been aptly labeled a "spatial mismatch" between the geographic distributions of the supply of, and demand for, blue collar labor. Despite the many studies devoted to evaluating the spatial mismatch hypothesis, the economic literature has not reached a consensus. While past research carefully documents both pervasive racial housing segregation [5, 18] and the flight of large blue collar employers from the central cities [15, 16], past work does not decisively establish a link between these trends and interracial employment and earnings differentials.

The debate can be focused on a single central question: given racial segregation and the continuing decentralization of employment, is the intra-metropolitan mobility of labor sufficient to overcome the spatial disadvantage of inner-city blacks? Past studies provide conflicting answers to this question largely depending on how intra-metropolitan variation in labor demand or, alternatively stated, access to employment opportunities is measured. Studies that employ direct measures of neighborhood labor demand, such as the number of jobs within a given commute time or the ratio of neighborhood jobs to workers, find little evidence in support of the mismatch hypothesis [4, 7, 17]. On the other hand, studies employing indirect measures of neighborhood labor demand, such as the average commute time of a neighborhood's employed low-wage workers, find strong supporting evidence [10, 11].

This paper presents a new, employment-based, measure of intra-metropolitan accessibility that, in direct contrast to past measures, provides strong evidence in support of the mismatch hypothesis. Several factors distinguish the measure presented here from accessibility measures employed in the past. First, the measure captures intra-metropolitan variation in the net growth of employment rather than spatial variation in employment levels. I show that the principal spatial disadvantage suffered by black male youths is that they live in areas of weak or negative net employment growth. In the metropolitan area studied, while employment levels are relatively high in areas immediately accessible to black youths, the net changes in employment between 1980 and 1990 are considerably higher in the areas immediately accessible to white male youths. Furthermore, dis-aggregating net changes in employment by broad industrial categories reveals large relative employment declines in the immediate vicinity of the average black youth in industries that are staple employers of black blue-collar workers, such as manufacturing, transportation, construction, and public utilities.

Second, the measure employed here accounts for a neighborhood's proximity to all other areas within the local labor market. I use the distance-decay function from a gravity equation to discount distant employment opportunities. Since the gravity equation empirically models the intra-metropolitan commute patterns of employed youth, the actual behavior of youth workers provides the discounting parameter. This is an improvement over past employment-based accessibility measures that rely on arbitrary boundaries to define the region accessible to a given neighborhood and that do not adequately incorporate the continuous effect of distance on accessibility.

The analysis focuses on the San Francisco-Oakland-San Jose Consolidated Metropolitan Statistical Area (CMSA) for the year 1990. Compared with other large metropolitan areas, the Bay Area CMSA is moderately segregated and has experienced changes in the geography of its industrial base similar to those of other cities. In pooled neighborhood employment rate regressions similar to those of Ellwood [4] and Leonard [17], differential accessibility explains between 30 and 50 percent of the average neighborhood employment rate differential between white and black male youth. Moreover, controlling for spatial accessibility explains nearly half the relationship between neighborhood poverty concentration and male youth employment rates. In neighborhood employment equations estimated separately by race, partial decompositions of the racial employment rate differential attribute a smaller share to spatial mismatch (approximately 20 percent). Nonetheless, there are reasons to believe that the latter methodology underestimates the contribution of differential accessibility.

This paper will proceed as follows. The following section reviews and critiques prior studies and documents the important differences between the spatial distributions of employment levels and employment growth. Next, I present the methodology behind the construction of the accessibility measures. This is followed by a description of the data and the main results of the paper. Finally, I offer conclusions.

2. Review of Previous Findings

The spatial mismatch hypothesis posits that intra-metropolitan employment decentralization, in conjunction with involuntary racial housing segregation, physically isolates low and semi-skilled minority workers from suburban employment opportunities. When central city labor demand is not sufficient to employ all central city residents, competition among inner-city workers will results in either lower wages, lower employment rates, or both. Assuming complete racial segregation, a finite elasticity of substitution between otherwise equal black and white workers,[1] and flexible wages, the excess supply of black blue-collar workers will depress the wages of black workers in the central city. When labor markets clear, black workers who commute to employment outside their areas of residence will be compensated for the costs of commuting to the point where the wages of black workers net of commuting costs are uniform over space. This gives rise to a wage gradient for black workers that increases with distance from the central city [21].

Physical isolation affects central city employment rates in two ways. First, lower wages in the central city induce some workers to withdraw from the labor force. This results in an overall reduction in the employment-to-population ratio. Second, to the extent that wages are inflexible due to binding minimum wage constraints or collective bargaining, insufficient labor demand in the central city will result in lower employment rather than wages. Minimum wage

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[1]As noted by Ihlanfeldt [9], differential wage gradients for black and white workers are possible only if race plays a role in the hiring decision.

constraints are more likely to affect youth workers as they are considerably more likely to work at jobs paying wages at or near the legal minimum [3].

Kain [14] first tested the mismatch hypothesis with data on the Chicago and Detroit labor markets. In his seminal work, Kain examined the effect of distance from the major black ghettos on the percentage of total employment held by black workers in geographically defined work place areas. He found that distance from the ghetto had a large negative effect on the percentage of black employment and concluded that residential desegregation would have substantially increased black employment, especially in Chicago. Kain's results were soon attacked by Offner and Saks [19] who, using the same data, showed that Kain's conclusions regarding the positive employment effects of desegregation were sensitive to the specification of his original regressions. In fact, an alternative specification of Kain's employment equation yielded the prediction that residential desegregation would have a negative effect on total black employment.

Among the more recent papers that attempt to evaluate the employment effects of differential accessibility, Ellwood [4] provides the strongest evidence against the spatial mismatch hypothesis. Using 1970 data for Chicago, the author presents a set of linear regressions of youth census tract employment rates on various neighborhood characteristics and a set of accessibility measures. Ellwood uses several accessibility measures including the proportion of jobs within a 30 minute commute of a given neighborhood, the ratio of neighborhood jobs to workers, and the average travel time of neighborhood workers. All the accessibility measures perform poorly; effects on neighborhood employment rates are statistically significant but small. Furthermore, the accessibility measures do not explain any of the relationship between neighborhood youth employment rates and the percentage of neighborhood residents that are black. Leonard [17] reproduces Ellwood's analysis with 1980 data for Los Angeles and arrives at similar results.

Recent evidence affirming the mismatch hypothesis is offered in several papers by Ihlanfeldt [8, 10] and Ihlanfeldt and Sjoquist [11, 12]. The authors reexamine the effects of spatial access on youth employment probabilities and earnings using individual microdata instead of aggregate census tract variables. In both comparisons across SMSAs [12] and an analysis of a single metropolitan area [11], the average commute time of low wage workers in an individual's area of residence significantly and substantially affects the probability that a particular youth is employed. In an analysis of the Philadelphia metropolitan area they find that differential accessibility explains between 33 and 54 percent of the black-white differential in employment probabilities. Similar magnitudes are found in the cross-SMSA analysis.

3. Shortcomings of Past Research

Past employment-based accessibility measures suffer two important shortcomings: (1) they are based on spatial variation in employment levels rather than employment growth, and (2) they fail to adequately characterize a neighborhood's location relative to all other areas in the local labor market. The first shortcoming points to a qualitative flaw in defining the sources of employment opportunities for new labor market entrants. The second shortcoming concerns the technical difficulties encountered in reducing a two-dimensional phenomena -- i.e., the location of a given neighborhood in urban space -- to a one-dimensional variable --i.e., an accessibility measure. I now turn to an independent discussion of each issue.

A. Employment Levels vs. Employment Growth

Job opportunities for new labor market entrants come from two sources: vacancies created by non-layoff labor turnover (quits, discharges, and retirement), and vacancies created by job growth. Assuming uniform turnover rates over space, accessibility measures based on employment levels capture spatial variation in turnover rates. However, turnover generates just as many job-seekers as it does job vacancies. Given that teenagers are marginal workers with little work and job-search experience, local teenage employment rates should be more sensitive to net rather than gross hiring. The geographical distribution of net employment growth depends on such factors as the spatial distributions of land prices, accessibility to transportation routes, and accessibility to the relevant product markets: all factors in which central cities are now at a disadvantage. There are no a priori reasons to believe that the level of employment within an area is positively correlated with the region's net employment growth. In fact, given the difference in population densities between central cities and suburbs, the opposite may be the case.[2] Accessibility measures based on employment levels miss the contribution of employment growth entirely.

Moreover, given the historical patterns of metropolitan land use, employment levels may be a poor gauge of turnover-induced job vacancies. In areas of relative decline such as densely populated central cities, poor employment growth lowers the area arrival rate of job offers (relative to high growth areas such as low-density suburbs) increasing the costs of job search for resident workers. Workers that live and work in these areas will be more reluctant to quit and more careful not to shirk on the job.[3] Furthermore, low area employment growth limits opportunities for employment-to-employment inter-firm labor mobility. In such areas, the relative stability of existing job matches increases the dependence of new labor market entrants (such as youths) on the fewer vacancies created by employment growth. Hence, the assumption that permits the use of employment stocks as a measure of turnover-induced vacancies, specifically that non-layoff turnover rates are uniform over space, is suspect.[4]

To illustrate the interaction between the spatial distribution of employment growth and racial residential patterns, Table 1 presents cumulative employment changes for the Bay Area

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[2]In an alternative test of mismatch, Ellwood [4] compares black youth unemployment rates for the west and south sides of Chicago finding little difference despite higher west-side employment levels. Kasarda [16] disputes the relative superiority of the west side labor market based on a similar argument to the one advanced here citing (1) the loss of 75 percent of industries and businesses between 1960 and 1970 in North Lawndale, the economic core of the west side, and (2) the economic devastation which befell this area as a result of the severe rioting of 1968 following the assassination of Dr. Martin Luther King Jr.

[3]This line of reasoning is consistent with the well-documented observation that black workers are much less likely to quit than white workers [2].

[4]This argument parallels the model of Akerlof et. el.[1] that attempts to explain strongly pro-cyclical voluntary inter-firm labor mobility. Autonomous job vacancies --e.g., employment growth -- set off vacancy chains, defined as the number of job switches, on average, per autonomous vacancy. The length of vacancy chains, and in turn, voluntary turnover, increases during periods of strong employment growth since opportunities for job switching expand in tight labor markets. Conversely, voluntary turnover is low when unemployment is high since the probability that a vacancy is filled by an unemployed worker (effectively ending the chain since the unemployed worker does not create an additional vacancy) increases with the unemployment rate. This model applies directly to the analysis of spatial variation in non-layoff turnover where spatial variation in autonomous vacancy creation is substituted for temporal variation.

CMSA between 1980 and 1990 by industry and by the 1990 racial composition of census tracts.[5] The table provides the 1990 levels of employment located within census tracts of a given racial composition, the absolute changes in employment between 1980 and 1990, and the percentage changes in employment. Employment growth rates in predominantly black census tracts are substantially less than growth rates for the entire region. While total employment increases by 23 percent for the entire CMSA, employment increases by less than 10 percent in census tracts with resident populations above 20 percent black. For census tracts between 60 to 80 percent black, total employment actually declines by nearly 20 percent.

Net employment growth in individual industries follows similar patterns of growth and decline, with the largest racial differences in manufacturing. While manufacturing employment declines slightly for the entire CMSA, manufacturing employment increases by nearly 6,000 jobs in tracts less than 20 percent black. The percentage change in manufacturing employment declines sharply with the percentage of residents that are black. For tracts between 20 and 40 percent, 60 to 80 percent, and greater than 80 percent black, manufacturing employment declines by 21, 34, and 51 percent, respectively. Similarly, wholesale and retail trade employment grew at rates below those for the overall regional in all tracts greater than 20 percent black. Employment growth in services and the combined industry category are not uniformly below the CMSA growth rate. Employment growth in services is relatively higher in tracts between 60 and 80 percent black and employment growth in the combined industry category is higher for census tracts between 40 and 60 percent and greater than 80 percent black.

Looking beyond employment growth within neighborhoods, are there systematic differences in employment growth in the areas surrounding the neighborhoods of white and black youth? Figures 1a through 4b provide graphical illustrations of the relative location of black male youths within the metropolitan area's spatial distributions of employment levels and employment

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[5]Tract level employment data for 1990 and 1980 were furnished by the Association of Bay Area Governments. The data are matched to racial population counts from the 1990 Census Summary Tape File 1A.

growth. The figures show the levels of employment in 1990 and the net change in employment between 1980 and 1990 within a 45 minute private transportation commute from the residences of the average black and white youths.[6] The graphs are constructed as follows. For each neighborhood,[7] I calculate the number of jobs within a one minute private transportation commute of the neighborhood, the number of jobs within a two minute commute, and so on until 45 minutes, for the year 1990. Next, I repeat the calculation for each neighborhood substituting the decade change in employment for the 1990 employment level. I then compute weighted averages by race of the level and change profiles using as weights the 1990 neighborhood counts of 16 to 19 year old black and white youths. Hence, a point on the level profile for the average white youth is interpreted as the number of jobs located within x minutes of the average white youth's residence while a point on the change profile is the net change in employment between 1980 and 1990 within x minutes of the average white youth's residence. Separate profiles are computed for total employment and employment by three broad industrial groups. The dashed vertical line at 18 minutes marks the average one-way commute time of employed Bay Area male youths.

Except for manufacturing, all figures show 1990 employment levels that are higher in the immediate vicinity of the average black youth. For example, while Figure 1a shows approximately 300,000 jobs within a 10 minute commute of the average white youth's residence, there are nearly 340,000 jobs within 10 minutes of the average black youth's residence. Similarly, the level profiles for the average black youth are everywhere above those of the average white youth for retail trade, and the combined graph of transportation, communication, public utilities, construction, and public administration.

The change profiles, however, paint an entirely different picture. Starting with employment growth in all industries, approximately 2,000 jobs were lost between 1980 and 1990

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[6]Nearly 99 percent of employed Bay Area male youths work within a 45 minute commute from their homes.

[7]Neighborhoods are defined in terms of modified regional travel analysis zones that are slightly larger than census tracts. A full discussion of the data and the relevant geography is presented below.

within two minutes of the average black youth's residence, while for the average white youth 2,000 jobs were gained. Within 10 minutes of the average black youth's residence, 20,000 jobs were added compared to a net gain of 40,000 jobs within 10 minutes of the average white youth. Moreover, the change profile for black youths is below that of white youths up to 26 minutes. Note, this is substantially above the 18 minute average commute of male youths.

The most dramatic differences between the level and change profiles are found in manufacturing (Figures 2a and 2b) and in the combined industries category (Figures 4a and 4b). At 20 minutes, the change profile for the average black youth indicates a loss of 19,000 manufacturing jobs while the similar figure for the average white youth is a loss of 7,000 jobs. Furthermore, the time-change profile for black youth is everywhere below that of white youth. In Figure 4b, approximately 25,000 jobs are lost within 20 minutes of the residence of the average black youth while for the average white youth 3,000 jobs are gained. The implications of Figures 2 and 4 are particularly severe since a fifth of black male youths and slightly more than half of low-skilled adult black males are employed in manufacturing; transportation, communication & public utilities; or public administration.[8]

The mismatch hypothesis links the relatively low employment and earnings of inner-city blacks to segregation and the decentralization of blue-collar employment. Employment growth is an important source of job opportunities, especially for recent labor market entrants such as youths. In terms of nearby employment growth, black youths are at a clear disadvantage. Direct employment based measures of spatial accessibility must account for this important factor.

B. The Spatial Characterization of Individual Neighborhoods

The second major shortcoming of past employment-based accessibility measures concerns the spatial characterization of a given neighborhood's location within the metropolitan distribution of employment opportunities. Past measures rely on arbitrary boundaries to define accessibility,

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[8]Calculations from the 1990 Public Use Microdata Sample (PUMS) show that 52 percent of employed black males between 20 and 55 years of age and with a high school degree or less are employed in the industries described by Figures 2 and 4.

such as the area within a 30 minute public transit commute from a neighborhood. An arbitrary commute length fails to capture large employers beyond the defined radius who may exert significant pull on a given neighborhood's workers.

Moreover, within the arbitrarily defined area, past measures do not allow accessibility to vary with distance. All employment opportunities within the defined area are assumed equally accessible whether they are 5 or 30 minutes away. The observed commute behavior of employed youth, however, indicates that this is not the case. Fully half of all employed male youths in this study commute less than 15 minutes while 75 percent commute less than 25 minutes. Assuming that the residential locations of youths are exogenously given, the sharply declining aggregate youth commute flow with distance indicates a strong attenuating effect of distance on accessibility.

The shortcomings of past employment-based accessibility measures provide some guidelines to constructing a new measure of spatial accessibility. First, employment opportunities should be defined by net changes in employment rather than levels. This better measure the geography of intra-metropolitan industrial change and provide a more concise measure of employment opportunities available to inner-city youth. Second, the neighborhood accessibility measure should account for the neighborhood's proximity to *all other neighborhoods* within the local labor market. In addition, the measure should account for the attenuating effect of distance on accessibility. Furthermore, the incorporation of distance should be based on the observed commute behavior of already employed workers rather than arbitrary speculation.

4. Empirical Framework and Data Description

I estimate two sets of equations that evaluate the importance of spatial accessibility in explaining youth employment rates in general, and in explaining the racial difference in youth employment rates in particular. First, following Ellwood [4] and Leonard [17], neighborhood employment-to-population ratios for all youth are regressed on a set of geographically defined accessibility measures and a host of neighborhood characteristics. The definition of neighborhoods is discussed below. Comparing the coefficient estimates on a variable measuring the percentage of neighborhood residents that are black across specifications with and without the accessibility measures indicates the extent to which differential accessibility explains the mean racial employment rate differential. To the extent that black neighborhoods have poorer accessibility, the coefficient estimate on the percentage black will drop after controlling for accessibility. Second, separate neighborhood employment rate equation are estimated by race. Following Ihlanfeldt and Sjoquist [11], partial decompositions of the racial employment rate differential provide alternative estimates of the share attributable to systematic differences in spatial accessibility.

In what follows, I assume that the youth residential distributions are exogenously given and that the geographic distribution of employment growth is exogenous with respect to the youth residential distributions. The exogeneity assumption concerning the youth residential distribution is based on the fact that most 16 to 19 year olds reside at home.[9] To the extent that parents ignore their childrens' preferences for spatial accessibility when choosing a residential location, this assumption will hold. The exogeneity of firm location can be justified by appealing to the set of factors unrelated to the distribution of the youth population that firms take into account when deciding where to locate within a metropolitan area --.e.g., horizontal land needs, proximity to freeway systems, proximity to growing suburban population centers and consumer dollars. If firms explicitly choose to locate far from neighborhoods with low youth employment rates due to characteristics of the youths in such neighborhoods, the estimated effects of accessibility in the empirical work below will be upwardly biased.

A. Constructing the Accessibility Measures

[9] Defining at-home youths as those residing with a parent, step-parent, or grandparent either as a member of a primary family or subfamily in a census household, calculation from the 1990 5% PUMS indicate that 78 percent of 16 to 19 year old Bay Area male youths lived at home at the time of the 1990 census. For employed youth, this figure is 76 percent. Furthermore, of the remaining 24 percent, the majority were in living arrangements that reflect a geographically constrained housing choice -- e.g., living with alternate relatives or living in a university dormitory.

I construct an employment-based accessibility measure that speaks directly to the criticisms outlined above. First, I estimate a simple trip-distribution gravity model to isolate the effect of distance on intra-metropolitan youth labor mobility. Next, the distance parameter is combined with neighborhood net employment changes between 1980 and 1990 to construct the accessibility measures.

Specifically, partitioning the Bay Area CMSA into *I* origin and *J* destination neighborhoods, I estimate the gravity equation

$$T_{ij} = kL_i^{\alpha}E_j^{\beta}\exp(-\gamma d_{ij}), \tag{1}$$

where i= (1,…,I) indexes origin neighborhoods, j= (1,…,J) indexes destination neighborhoods, T_{ij} is the count of youths that live in neighborhood i and work in neighborhood j, L_i is the count of youth workers residing in i, E_j is the count of jobs located in j, d_{ij} is the distance between neighborhoods i and j measured by private vehicle commute time, and α, β, γ, and k are parameters to be estimated. The gravity equation models the aggregate spatial interaction between two areas, here the interaction being the aggregate commute flow of youth labor from an origin to a destination neighborhood. The origin labor supply and destination labor demand capture the possible scale of interaction. By entering labor supply and demand multiplicatively, the potential scale of interaction increases in the total possible combinations of worker-job matches.

The parameter, γ, in the "distance-decay" function is of primary interest. The specific functional form of the decay function in equation (1) is a more general form of the function often used in transportation planning models [6]. The exponential decay function is directly derived from entropy maximization and implies that the aggregate flow of labor declines proportionately with distance. As the dependent variable in equation (1) is the count of workers that flow between given neighborhoods, estimation requires the use of an empirical model that takes the dependent variable as being generated from a discrete probability process. I estimate equation (1) with a negative-binomial count model. An appendix including a detailed discussion of the estimator and these first-stage estimation results is available from the author upon request.

Assuming an exogenously given residential distribution, the observed spatial distribution of work trips can be interpreted as the result of spatial job search from fixed residential locations. Moreover, the attenuating effect of distance on aggregate commute flows provides information concerning the accessibility of distant employment opportunity. I use the estimate of the distance-decay function in equation (1) to discount distant employment opportunities. Specifically, let $CHANGE_j$ be the total change in employment in neighborhood j between 1980 and 1990. Then the number of accessible employment opportunities created over the decade for workers in neighborhood *i* is

$$ACCESS_i = \sum_{j=1}^{j=J} CHANGE_j * \exp(-\overline{\gamma} d_{ij}), \quad (2)$$

where the line over γ indicates the parameter estimate. The accessibility measure is similar to the gravitational potential measure specified by Isard [13]. In addition to increasing in the employment growth of the base neighborhood, the measure increases in the employment growth of immediately surrounding neighborhoods. Furthermore, the measure places less weight on relatively distant employment opportunities. I calculate the accessibility measure in equation (2) for total employment and individually for the five industrial groupings presented in Table 1.

While the accessibility measures derived from equations (1) and (2) capture the spatial variation in labor demand, they do not account for spatial variation in labor supply. Controlling for spatial differences in labor supply is particularly important when analyzing racial differences in youth employment rates, since inner-city youths live in more densely populated areas with higher concentrations of low-skilled workers than those of their suburban counterparts. To incorporate geographic differences in the supply of labor, I construct a neighborhood labor supply variable that accounts for the neighborhood's location within the spatial distribution of low-skilled labor. Since adult low-skilled workers compete directly with teenagers for job vacancies, I base the measure on both the competition from other teenagers and the competition from adult low-skilled workers. Let $SUPPLY_j$ be the sum of all teenagers and of adults with less than a high school education residing in neighborhood j. Again, employing the estimated distance-decay function from equation (1), I define the directly competing supply of labor to teenage workers in neighborhood i as

$$COMPETING\ LABOR_i = \sum_{j=1}^{j=J} SUPPLY_j * \exp(-\overline{\gamma} d_{ij}). \tag{3}$$

The accessibility measures from equation (2) and spatial measure of labor supply in equation (3) are the principal geographic measures used in the analysis.

B. Description of the Data and Specification of the Neighborhood Employment Equations

The data employed here are for the San Francisco-Oakland-San Jose CMSA and come from four sources. Census tract-level demographic variables come from the 1990 Census Summary Tape File 3A. By request, the Census Bureau provided aggregate tract-to-tract youth commute flows and tract-level counts of 16 to 19 year old male youths by employment status and by race. A complete matrix of zone-to-zone AM peak-period travel times comes from the Bay Area Metropolitan Transportation Commission (MTC). These data give the estimated travel time by private vehicle and public transit between all origin-destination pairs of regional traffic analysis zones. Finally, the Association of Bay Area Governments (ABAG) provided tract-level employment counts by broad industrial groupings for the years 1980 and 1990. ABAG compiles these counts from state ES-202 files.

While the demographic data, employment data, and journey-to-work flow data are calculated at the census tract-level, the MTC calculates the travel-time matrix for its own Regional Traffic Analysis Zone (RTAZ) system. For the most part, the 1,382 Bay Area census tracts are nested within the MTC's 700 RTAZ system and matching the data simply requires the appropriate aggregation of the Census Bureau data. In a hand full of cases, however, the MTC system splits census tracts into two or more RTAZs. In these cases, I aggregate the inter-zonal travel times to the tract level by averaging. After all necessary adjustments, the matched data set describes 660 zone-based neighborhoods. After eliminating zones without teenage residents, 634 zones remain. This zone system defines the main geographic unit of analysis. In estimating the gravity equation, I exclude all origin-destination pairs with zero origin counts of teenagers or zero destination employment counts. In all, 423,776 origin-destination observations remain after imposing these restrictions.

Unfortunately, aggregation qualitatively affects the dependent variable. Specifically, aggregating from census tracts to the modified RTAZ system reduces the racial differential in neighborhood employment rates. Calculating the racial employment differential by comparing the tract-level youth employment-to-population ratio for the average white and black male youths yields a racial employment differential of 14 percent. A similar calculation with the modified zone system gives a racial differential of approximately 11 percent. Aggregation dilutes spatial differences in employment rates by combining high employment rate and low employment rate areas. Furthermore, aggregation reduces spatial variation in the accessibility measures and all other demographic variables used. As I am constrained by the geography of the travel-time matrix, I can only acknowledge the problem.

In addition to the spatial accessibility and supply variables and the variable measuring the proportion of zone residents that are black (Black), I include several other neighborhood characteristics in the employment equations. The additional neighborhood variables fall into one of two categories: variables measuring the quality of youth and adult labor and variables that measure the adverse concentration effects resulting from the social isolation of poor neighborhoods. Labor quality controls include the proportion of all 16 to 19 year olds that are high school dropouts (Dropout), the proportion of 16 to 19 year olds that are enrolled in school (Enrolled), and the proportion of adult residents with less than a high school education (< High School). The proportion of teenagers enrolled in school affects the dependent variable in two ways. First, the higher the percentage attending school the higher the average quality of teenage labor. Hence, in neighborhoods with high attendance rates, one would expect relatively high quality teenage labor, on average. Similar reasoning justifies the inclusion of the "Dropout" variable. On the other hand, as the dependent variable measures the employment-to-population ratio for all male teenagers regardless of enrollment status, the proportion enrolled may also indicate the extent to which neighborhood youths are available to work.

I include the proportion of adult residents with less than a high school education for several reasons. First, the average level of adult human capital provides additional information about the human capital endowment of the neighborhood teenage population. Since it is impossible to control for personal characteristics with summary data, I include as many variables as possible that capture spatial variation in the underlying quality of teenage labor. Second, aside from the technological arguments offered to explain employment decentralization, one can argue that employers of blue collar labor leave poor depressed areas because resident workers do not meet necessary skill requirements. In this scenario, skill deficiencies of inner-city neighborhoods drive the observed relationship between employment rates and employment decentralization. To partially account for this possible omitted variables bias, I include a measure of the average quality of all neighborhood workers.

The second set of neighborhood variables captures the effects of the concentration of poverty and the social isolation of poor neighborhoods on the employment prospects of local youth. Wilson [22] argues that the flight of the black middle class from predominantly black inner-city neighborhoods has eroded informal employment information networks. As the concentration of poverty, welfare dependence, and unemployment increases in inner-city communities, the efficacy of informal channels of employment information erodes. Hence, in addition to being physically removed from areas of high employment opportunity, the geographic concentration of unemployment and poverty socially isolates inner-city youths from the labor market, further reinforcing the adverse effects of physical isolation. These self-reinforcing aspects of spatially concentrated poverty are what Wilson calls "concentration effects". O' Regan and Quigley [20] test for these effects and find that direct familial contacts to the labor market and neighborhood poverty concentration significantly impact youth labor market outcomes. To control for such effects, I include the average neighborhood household income, the proportion of residents living in poverty (Poverty), and the proportion of households headed by a single parent (Single Parent).

Table 2 provides the descriptive statistics for all Bay-Area male youths and Bay-Area male youths by race. All figures are neighborhood weighted averages where the weights are the 1990 neighborhood counts of the respective youth population and neighborhoods are defined by the 660 zone system. There is approximately an 11.5 percentage point differential between the neighborhood employment rate of the average white youth and that of the average black youth. The spatial variables indicate a clear accessibility disadvantage for black youths. With the exception of retail trade and services, the accessibility measures are relatively lower for black youths. Furthermore, the immediately competing labor supply is higher for black youths. With respect to the other neighborhood variables, relative to white youths black youths live in neighborhoods with lower household incomes, higher poverty rates, higher proportions of families headed by a single parent, lower levels of adult educational attainment, high teenage high school dropout rates, and lower school attendance rates.

The final column of Table 2 provides the ratio of the variances from the weighted distributions obtained by weighting each neighborhood variable separately by the neighborhood counts of black and white youth. For all variables with the exception of "Black", variances are considerably lower for black youth. Looking specifically at the accessibility measures, the black-white ratio in the variances ranges from .10 to .26. The similar ratio for the competing labor variable is .15. Hence, in addition to having poorer physical accessibility on average, the distribution of accessibility experienced within the black youth population is more tightly distributed around the lower mean. This will be important to keep in mind when discussing the reliability of the results from separate equations estimated by race.

5. Empirical Results

In this section, I present the main results of the paper. First, I present results from regressions of neighborhood male youth employment on the constructed accessibility measures and discuss how controlling for accessibility alters the estimated effects of other neighborhood variables. The racial differences in average accessibility presented in Table 2 and the parameter estimates from the employment equations are used to evaluate the importance of differential accessibility in explaining the racial difference in neighborhood employment rates. Next, I present results from separate equations estimated by race and use a partial decomposition analysis to calculate an alternative set of estimates of the portion of the racial employment differential due to racial differences in accessibility. Finally, I estimate employment equations using accessibility measures employed in past studies to highlight differences in results. All regressions reported in this section are weighted by the relevant count of neighborhood male youth. While weighting improves the fit of the equations, it does not qualitatively affect the results.

A. Employment Regressions Pooling all Youth

Table 3 presents two sets of regressions of male youth employment rates on the competing labor and spatial accessibility variables. The first two columns present results from specifications where only the spatial accessibility and competition variables are included. In both regressions, the competing labor variable has a strong negative effect on neighborhood youth employment rates. The effect of the “All Industries” accessibility variable in column (1) is positive and significant as predicted by the spatial mismatch hypothesis. Combined with the competing labor supply variable, accessibility to all jobs explains approximately 12 percent of the variance in neighborhood male youth employment rates. Replacing the all industries accessibility measure by the set of industry-specific measures improves the fit, as can be seen in the higher R^2 in equation (7) of approximately 15 percent. Hence, the geographically defined measures alone explain a substantial portion of the intra-metropolitan variation in male youth employment rate.

Columns (3) through (5) add the proportion of neighborhood residents that are black to the specification. For purposes of comparison, column (3) provides results from a baseline regression of neighborhood employment rates on the variable “Black” only. Similar to the findings of Ellwood [4] and Leonard [17], the variable "Black" has a strong negative effect on neighborhood employment rates. Contrary to their results, however, adding the spatial accessibility measures substantially reduces the effect of neighborhood racial composition. In column (4), adding the all industries accessibility measure and the competing labor supply variable to the baseline specification of column (3) results in a 29 percent decrease in the estimated coefficient on "Black" from -.3394 to -.2422. Replacing the all industries accessibility measure by the set of industry-specific measures causes a larger decrease of 32 percent. Hence, the relative physical isolation of predominantly black neighborhoods explains a substantial portion of the negative relationship between the variable "Black" and neighborhood youth employment rates. While only one of the coefficients of the six geographical variables in the results presented in column (5) is statistically significant, an F-test of the regression in column (5) against that of column (3) strongly rejects the hypothesis that the set of spatial variable are collectively insignificant.

The next to last row of Table 3 provides the proportion of the actual racial differential predicted by each regression when evaluated at the race-specific means of the accessibility and competing supply variables provided in Table 2. For the regressions in columns (4) and (5), "Black" is set to the sample mean. Differential accessibility predicts racial neighborhood youth employment rate differentials between 29 percent (specification in column (4)) and 51 percent (specification in column (2)).

Table 4 adds the neighborhood labor quality and social isolation variables to the basic regressions. The effects of the neighborhood variables on the male youth employment rate are as expected with the exception of average household income and the proportion of families headed by a single parent. The coefficients on "Single Parent" are statistically insignificant in all the regressions. The negatively significant coefficients on average household income may reflect the higher non-labor incomes of youths from relatively wealthy homes (recall, the dependent variable measures the employment rate of all male youths regardless of enrollment status). The labor quality variables (Enrolled, Dropout, and < High School) negatively affect neighborhood employment rates. The negative effects of the proportion of youths that dropout and the proportion of the adult population with a high school education or less reflects the effect of neighborhood human capital on male youth employment rates. The estimated negative effect of "Enrolled" indicates that the variable partially captures the percentage of youths available for work.

In regression (1), the proportion of neighborhood residents living in poverty has a strong negative effect on the neighborhood employment rate. Using the racial difference in neighborhood poverty rates given in Table 2, the negative employment effect of "Poverty" alone implied by the first regression in Table 4 predicts a 4.5 percentage point differential between the neighborhood employment rate of the average white youth and that of the average black youth (-.56501*(.148-.068)). Note, this is nearly 40 percent of the total racial differential in neighborhood employment rates. The coefficient on "Black" in the first equation is nearly identical to the estimated effect of this variable when the neighborhood quality and isolation variables are omitted.

Adding the spatial variables to the equation yields several interesting results. Starting with regression (2), adding the all industries accessibility measure and the competing labor supply variable reduces the estimated coefficient on the variable "Black" by 20 percent (from -.3379 to -.2753). Furthermore, the coefficient estimate on "Poverty" drops considerably, from -.5601 to -.3591. The estimated effects of all other variables change very little with the exception of "< High School". Both of the coefficients on the competing labor supply and the all industry variables have the expected sign and are highly significant.[10]

Replacing the all industries accessibility measure by the set of industry-specific accessibility measures yields even larger changes. The estimated coefficient on the variable "Black" drops by 27 percent, from -.3379 in regression (1) to -.2459 in regression (3). The largest change occurs in the estimated effect of the proportion of residents living in poverty. The coefficient estimate drops by nearly half, from -.5601 to -.2851. While in regression (1) the difference in neighborhood poverty rates between that of the average white male youth and that

[10]The regressions in Table 4 were alternatively estimated substituting dummy variables for ranges of neighborhood poverty concentration for the poverty variable. Equation were also estimated adding a quadratic poverty term. These different specifications of the effect of poverty do not affect the main results of Table 4. For presentational simplicity, the more parsimonious specification is reported here.

of the average black male youth predicts a 4.5 percentage point differential in neighborhood employment rates, the smaller coefficient on "Poverty" in regression (3) predicts a 2.3 percentage point differential. All of the other coefficients in regression (3) are similar to the estimates in regression (1). Again, while only one of the six coefficient on the spatial variables is statistically significant (wholesale trade), an F-test of regression (3) against regression (1) strongly rejects the hypothesis that the six spatial variables are collectively insignificant.

The next to last row of Table 4 presents the proportion of the actual neighborhood racial differential predicted by the parameter estimates of the corresponding regression and the race-specific means presented in Table 2. In these calculations, all other neighborhood variables are set to the overall sample means. Approximately one-third of the neighborhood youth employment rate differential is predicted by the regression results in Table 4. Hence, the results in both Tables 3 and 4 indicate a strong role of spatial mismatch in explaining the relatively poor outcomes of Bay Area black youth.

B. Race-Specific Employment Equations and Partial Decompositions

In the previous section, systematic racial differentials in accessibility were used to predict the average difference in the employment rates *of all youth* in the neighborhoods of the typical white and black youths. An alternative method of estimating the contribution of differential accessibility to racial youth employment differentials is to estimate separate equations by race. Here the dependent variables are now the employment-to-population ratio of black youth and white youth rather than the overall youth employment rate. Simple decomposition analysis following Ihlanfeldt and Sjoquist [11] can then be used to compute the contribution of differential accessibility to the relatively poor performance of black youth. Specifically, define the equations

$$E_{wi} = X_i\beta_w + A_i\alpha_w + \varepsilon_{wi} \qquad (4)$$

$$E_{bi} = X_i\beta_b + A_i\alpha_b + \varepsilon_{bi}, \qquad (5)$$

where E_{ji} (j= b, w) is the employment-to-population ratio for group j in neighborhood *i*, X_i is the vector of neighborhood characteristics, A_i is the vector of accessibility and competing labor supply variables, and ε_{wi} and ε_{bi} are normally distributed residuals. Define X_w , A_w , X_b , and A_b , as the average values of the neighborhood characteristics obtained by computing averages weighted by the counts of white and black youth respectively. Using the parameter estimates from equations (4) and (5) one can compute hypothetical employment rates for each racial group based on the mean accessibility measures of the other. For example, the employment rate for white youth with mean accessability values equal to that of black youth is

$$E_w^* = X_w\overline{\beta_w} + A_b\overline{\alpha_w}, \tag{6}$$

where the line over the parameters indicates estimated values. Letting E_w and E_b equal the weighted mean white and black youth employment rates, the average racial youth differential can be decomposed into

$$E_w - E_b = (E_w - E_w^*) + (E_w^* - E_b). \tag{7}$$

The first component on the right hand side of equation (7) gives the portion of mean racial employment differential explained by differential accessibility (evaluated at the parameter values of the white employment equation), while the second component gives the portion due to all other factors. A similar partial decomposition can be constructed plugging white mean accessibility in the estimated black youth employment equation.

Table 5 presents the estimation results for equations (4) and (5). The next to last row of the table gives the predicted racial differential due to differences in accessibility (the first component on the right hand side of equation (7)) divided by the total racial differential. The figure below the regression results for white youth gives the predicted differential when black mean accessibility is plugged into the white youth employment equations while the figure in the black youth column gives the opposite calculation. Looking first at the estimation results from the white youth equation, the parameter estimates closely resemble those for all youth presented in Table 4. All of the non-accessibility variables (except “Single Parent”) are statistically significant and resemble the parameter estimates from the pooled equation. One difference is that the competing labor supply coefficient is small, the wrong sign and statistically insignificant. The remainder of the spatial accessibility variables have similar point estimates and an F-test of the six spatial variables strongly rejects the hypothesis of their collective insignificance. The ratio of the predicted to actual racial differential (.19) is somewhat smaller than the lowest estimate from the pooled regressions (.29). Nonetheless, the percent predicted is a substantial portion of the mean racial employment differential. Moreover, to the extent that racial segregation exists within zones and that accessibility varies within the defined neighborhoods, this figure will be negatively biased.[11]

Turning to the results for black youth, the equation fits the data poorly. Only two of the non-accessibility neighborhood variables (Average Household Income, Dropout) and one of the accessibility variables (Wholesale Trade) are significant. An F-test of the collective significance of the six spatial variables yields marginal results with a test statistics of 1.7 and p-value of .12. The predicted-to-actual ratio obtained from plugging the accessibility means for white youth into the black youth equation indicates that twelve percent of the racial differential is due to differential accessibility. This is surprising since one would expect the employment rates of black youth to be more sensitive to variation in accessibility given the lower adult employment rates and consequently weaker informal information networks in black communities.

Several factors, however, suggest that the results from the separate equation for black youth are unreliable. As can be seen in the ratio of the variances given in Table 2, there is considerable less variation in both the dependent and explanatory variables for black youth. Black youth are present in fewer neighborhoods than white youth yielding a much smaller sample size

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[11]As discussed earlier, there are 660 regional traffic analysis zones imposed on 1,382 census tracts. The aggregation from tracts to zones dilutes variance in both the dependent and explanatory variables of analysis in this paper.

for the two equations (632 and 367 for white and black youth respectively). Moreover, within the subset of neighborhoods with black youth, black youths are highly concentrated within a few zones.[12]

In summary, regression results when equations are estimated separately by race attribute a smaller yet substantial portion of the youth racial employment differential to difference in physical accessibility. Since the black employment regression provides a weak experiment due to small sample size, concentration of black youths within few neighborhoods, and relatively little variance in the dependent and explanatory variables, I place more weight on the differentials predicted by the white employment equation. Moreover, I interpret the results from the white employment regression as providing lower-bound estimates due to the possibility of systematic racial differences in accessibility within zones.

C. Comparison to Accessibility Measures Used in the Past

The results presented in Tables 3 through 5 stand in stark contrast to the findings of similar studies of Chicago [4] and Los Angeles [17]. These previous studies failed to find substantial relationships between various measures of spatial accessibility and neighborhood youth employment-to-population ratios. Moreover, the small measurable effects of the accessibility measures used did not explain the negative relationship between youth employment rates and the percentage of neighborhood residents that are black. In addition to differences in the measurement of spatial accessibility, several factors may explain these conflicting results independently of the specific accessibility measure used. The geography of the Bay Area is quite distinct from that of Chicago or Los Angeles and may aggravate the extent and effects of black spatial isolation from employment opportunities. Furthermore, the current study uses data for 1990 while Ellwood's Chicago study uses data for 1970 and Leonard's Los Angeles study uses data for 1980. If the extent of mismatch has increased over time or if parallel developments -- e.g., the exodus of the black middle class from inner city neighborhoods emphasized by Wilson [22] -- has created a

[12]Fully one-fifth of the 367 neighborhoods with black youths have black youth counts below 5.

situation were the employment prospects of inner-city youth are now, more than ever, exceedingly sensitive to the amount of immediately accessible opportunities, then mismatch studies focusing on different time periods will yield conflicting results.

To investigate such possibilities, I reproduce Ellwood's Chicago employment regressions using similar accessibility measures and 1990 Bay Area data. While significant differences exist between the geographic units of analysis in Ellwood's study and this study,[13] the data does allow me to construct rough approximations of Ellwood's accessibility measures. I construct variables measuring the average commute time of all neighborhood workers, the average commute time of neighborhood male youths with jobs, the ratio of jobs to workers within the residence zone, and the ratio of jobs to workers within 30 minutes of the residence zone. For the jobs-to-workers ratios, at the zone level and within 30 minutes, I use several alternative numerators including employment in all industries, manufacturing employment, and "blue collar" employment, defined simply as the sum of manufacturing, retail, and service employment.[14]

Table 6 presents results from regressing neighborhoods male youth employment rates on the full set of neighborhood controls and the Ellwood accessibility measures. Each row of the table corresponds to an individual regression.[15] For a point of reference, the first row presents the regression results omitting accessibility measures. This is the same regression presented in the third column of Table 4. I omit the full set of coefficient estimates on the other neighborhood

[13] Ellwood's dependent variable is defined at the census tract level and accessibility is measured for "neighborhood areas" that are larger than census tracts. Here, the geographic unit of the dependent variable and the unit used for the accessibility measures are the same. Moreover, the modified traffic analysis zones discussed in the previous section are slightly larger, in terms of area and population, than census tracts.

[14] Since I am unable to reproduce Ellwood's blue collar import ratios exactly (the ABAG employment data is dis-aggregated by industry only), I experimented with several possible combinations of industries as measures of blue collar employment. The results did not differ significantly for different definitions of blue collar employment

[15] Since Ellwood presents results from pooled regressions for all youth, I only report the comparable estimates. Separate equations by race similar to those in the previous section yield similar results to those reported in Table 6.

variables as they do not differ substantially from the results in Table 4 and do not change as a result of including the alternative accessibility measures in the specification.[16] Table 6 gives several statistics. The second column presents the coefficient estimate for each individual accessibility measure, the third column gives the coefficient on the variable measuring the proportion of neighborhood residents that are black, while the fourth column provides the R^2 of the regression. The final column uses the coefficient estimates of the accessibility measures and the mean differences of the accessibility measures between the average white and black youth to compute a predicted racial differential in the neighborhood youth employment-to-population ratio. The numbers in parenthesis in the final column give the ratio of the predicted to actual racial employment differential.

Of the eight accessibility measures shown in Table 6, only two have statistically significant effects on the neighborhood youth employment rates (the "all industries" and "manufacturing" jobs-to-workers ratio within 30 minutes of the zone), one of which has the wrong sign (all industries). The average travel time measures have no discernable effect on the dependent variable as do none of the zone level jobs-to-workers ratios. Similar to Ellwood's findings, adding these accessibility measures does not substantially effect the coefficient estimate on the variable measuring the proportion of neighborhood residents that are black. The largest decline in the coefficient estimate for the variable "Black" occurs when the 30 minute manufacturing jobs-to-workers ratio is added to the employment equation (declining from -.3379 to -.3101).

None of the eight accessibility measures presented in Table 6 predict a substantial portion of the racial employment differential. The proportion of the actual racial differential in neighborhood employment rates predicted by these accessibility ranges from .00 to .06, with the high being that predicted by the 30 minute manufacturing ratio. This contrasts sharply with the results presented in Table 5 where it is shown that (in similarly specified equations) the geographic

[16]The full regression results for the specification including the entire set of neighborhood controls, as well as regression results from the alternative specifications used in Table 3 are available from the author upon request.

accessibility measures presented in this paper predict racial neighborhood employment rate differentials equivalent to between 29 and 36 percent of the actual differential. Hence, rather than differences in the metropolitan areas studied or differences in time periods, differences in the construction of the accessibility measures appear to explain the divergence in results from past studies.

6. Conclusion

This paper has demonstrated the importance of urban geography and the distribution of employment growth in determining the differential employment rates of black and white youth in one large Consolidate Metropolitan Statistical Area. In pooled regression of total youth employment rates, differential accessibility to areas of high employment growth is sufficient to explain between 30 and 50 percent of the racial differential in neighborhood youth employment rates. In estimates from separate regressions by race, the more reliable decomposition attributes approximately twenty percent of the racial youth employment differential to systematic accessibility differences. As the CMSA studied is only moderately segregated relative to other large metropolitan areas and has experienced changes in the spatial configuration of industry similar to other cities, there is little reason to believe that these results are atypical. In fact, one would expect a more stark mismatch in such hyper-segregated cities as Chicago and Detroit. In future research, I intend to extend the analysis here to additional metropolitan areas.

Note, this paper only examines a single aspect of how the constrained residential choice of African-Americans affects their employment and earnings prospects. The racial disparity in accessibility may widen as young workers mature and gain control over their residential choices. With the ability to move, the geographic area in which a worker will search for employment expands, since relocating to be nearer to one's place of work is now an option. With severe racial discrimination in the housing market, however, the search area of blacks is still constrained to employment areas in, or within the immediate vicinity of, predominantly black neighborhoods. On the other hand, the search area of white workers now encompasses the entire metropolitan area since their residential choices are not constrained by housing discrimination and they can more easily relocate for employment purposes. Future research on racial differences in geographic mobility, both within and between metropolitan areas, would provide a more complete assessment of how housing discrimination impacts the employment prospects of African Americans.

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Table 1
Changes in Employment 1980 to 1990 by Neighborhood Racial Composition, and by Broad Industry Categories for the San Francisco-Oakland-San Jose CMSA

Neighborhood Racial Composition	Total	Manu-facturing	Wholesale Trade	Retail Trade	Services	Combined[a]
Entire CMSA						
1990	3,073,735	494,622	183,961	515,014	1,019,437	825,591
1990 - 1980	538,106	-5,859	69,246	116,687	308,627	52,854
% Change	23.12%	-1.17%	60.36%	29.29%	43.42%	6.84%
< 20% Black						
1990	2,725,951	444,504	160,113	470,589	905,186	711,798
1990 - 1980	513,168	5,713	65,354	107,656	280,968	56,552
% Change	23.19%	1.3%	68.96%	29.66%	45.01%	8.63%
20%< Black≤40%						
1990	157,449	19,252	9,626	21,632	59,547	46,936
1990 - 1980	11,718	-5,287	448	3,152	11,774	1,769
% Change	8.04%	-21.55%	4.88%	17.06%	24.66%	3.92%
40%< Black≤60%						
1990	76,816	7,280	6,028	9,344	25,945	28,815
1990 - 1980	3,816	-4,208	1,165	-105	4,200	2,849
% Change	5.23%	-36.63%	23.96%	-1.11%	19.31%	11.41%
60%< Black≤80%						
1990	39,984	10,570	2,964	3,865	12,413	9,860
1990 - 1980	-9,203	-5,549	286	573	3,978	-8,466
% Changes	-18.71%	-34.06%	10.68%	17.41%	47.16%	-46.2%
80%< Black						
1990	33,832	4,433	2,967	3,634	10,067	12,652
1990 - 1980	243	-4,669	327	612	2,512	1,488
% Change	.72%	-51.30%	12.39%	20.25%	33.25%	13.33%
Unpopulated						
1990	39,635	8,583	2,263	5,950	6,279	16,530
1990 - 1980	18,364	8,051	1,666	4,799	5,190	-856
% Change	82.26%	1,513%	279%	416%	476%	-4.92%

Data furnished by the Association of Bay Area Governments.
a. The combined industry category includes transportation, communication, other public utilities, construction, and public administration.

Table 2
Neighborhood Descriptive Statistics for Bay-Area Male Youths, Total and by Race[a]

Variables	Total Sample	White	Black	Ratio of Variances Black/White
Neighborhood Employment Rate	.447	.464	.351	.193
Spatial Accessibility Variables				
All Industries	22,105	22,890	17,456	.108
Manufacturing	-1,500	-994	-4,499	.172
Wholesale Trade	-3,504	3,582	3,044	.109
Retail Trade	5,056	5,003	5,373	.114
Services	15,022	14,379	18,833	.218
Combined[b]	239	1,122	-4,993	.267
Competing Labor	23,286	21,825	31,356	.155
Other Neighborhood Variables				
Black	.089	.049	.328	2.07
< High School	.081	.076	.110	.201
Single Parent	.105	.094	.175	.906
Poverty	.080	.068	.148	.554
Dropout	.083	.075	.131	.258
Enrolled	.815	.825	.761	.369
Average Household Income	$54,056	$56,384	$40,262	.074

a. The means are calculated by taking the weighted average of the neighborhood variables where the weights are either the count of all white and black youths, white youths only, and black youths only.
b. Combined industrial category includes transportation, communication, other public utilities, construction, and public administration.

Table 3
Regressions of Neighborhood Male Youth Employment Rates on Spatial Accessibility Measures, Competing Labor Supply, and the Proportion of Neighborhood Residents that are Black

Variables	(1)	(2)	(3)	(4)	(5)
Constant	.4444 (33.61)	.4746 (29.34)	.4777 (74.69)	.4697 (35.00)	.4812 (30.43)
Black	-	-	-.3394 (-9.74)	-.2422 (-6.38)	-.2309 (-5.77)
Competing Labor Supply	$-3.13x10^{-6}$ (-8.19)	$-2.45x10^{-6}$ (-2.95)	-	$-2.15x10^{-6}$ (-5.39)	$-1.04x10^{-6}$ (-1.23)
All Industries	$3.44x10^{-6}$ (6.81)	-	-	$2.24x10^{-6}$ (4.28)	-
Manufacturing	-	$4.25x10^{-6}$ (2.65)	-	-	$1.21x10^{-6}$ (.733)
Wholesale Trade	-	$1.18x10^{-5}$ (3.89)	-	-	$6.65x10^{-6}$ (2.15)
Retail Trade	-	$4.03x10^{-6}$ (.73)	-	-	$6.57x10^{-6}$ (1.21)
Services	-	$-1.71x10^{-6}$ (-.886)	-	-	$-2.93x10^{-6}$ (-1.54)
Combined[a]	-	$1.07x10^{-6}$ (.849)	-	-	$1.21x10^{-6}$ (.984)
R^2	.121	.146	.130	.175	.189
Predicted/Actual[b]	.43	.51	-	.29	.32
N	634	634	634	634	634

T-statistics are in parenthesis. All regressions are weighted by the count of neighborhood male youths.
a. The combined industry category includes transportation, communication, other public utilities, construction and public administration.
b. This figure gives the proportion of the racial differential predicted by the parameter estimates and mean differences in the accessibility and competing supply variables.

Table 4
Regressions of Neighborhood Male Youth Employment Rates on Spatial Measures and All Other Neighborhood Variables

Variables	(1)	(2)	(3)
Constant	1.0022 (11.80)	.9466 (11.34)	.9815 (11.63)
Average Household Income	$-2.01\text{x}10^{-6}$ (-6.02)	$-2.05\text{x}10^{-6}$ (-6.28)	$-2.18\text{x}10^{-6}$ (-6.53)
Enrolled	-.4069 (-4.63)	-.3674 (-4.26)	-.3647 (-4.24)
Dropout	-.3036 (-3.45)	-.3187 (-3.71)	-.3310 (-3.86)
Poverty	-.5601 (-4.38)	-.3593 (-2.74)	-.2851 (-2.08)
Single Parent	.2644 (1.43)	.1594 (.877)	.1217 (.648)
< High School	-.5237 (-2.37)	-.3973 (-1.82)	-.5317 (-2.32)
Black	-.3379 (-5.97)	-.2735 (-4.81)	-.2459 (-4.16)
Competing Labor Supply	-	$-2.02\text{x}10^{-6}$ (-4.93)	$-1.50\text{x}10^{-6}$ (-1.75)
All Industries	-	$2.41\text{x}10^{-6}$ (4.76)	-
Manufacturing	-	-	$2.32\text{x}10^{-6}$ (1.47)
Wholesale Trade	-	-	$9.23\text{x}10^{-6}$ (3.06)
Retail Trade	-	-	$-3.01\text{x}10^{-6}$ (-.547)
Services	-	-	$2.64\text{x}10^{-7}$ (.127)
Combined[a]	-	-	$2.10\text{x}10^{-6}$ (1.70)
R^2	.228	.267	.278
Predicted/Actual[b]	-	.29	.36
N	634	634	634

T-statistics are in parenthesis. All regressions are weighted by the count of neighborhood male youths.
a. The combined industry category includes transportation, communication, other public utilities, construction and public administration.
b. This figure gives the proportion of the racial differential predicted by the parameter estimates and mean differences in the accessibility and competing supply variables

Table 5
Neighborhood Employment Rate Regressions by Race on Spatial Accessibility Measures and Other Neighborhood Controls

Variables	White	Black
Constant	1.0931 (12.03)	.6607 (3.38)
Average Household Income	-2.23×10^{-6} (-6.74)	-4.24×10^{-6} (-2.67)
Enrolled	-.4499 (-4.93)	-.0841 (-.42)
Dropout	-.2587 (-2.81)	-.3723 (-2.03)
Poverty	-.4365 (-2.95)	-.1018 (-.34)
Single Parent	-.1395 (-.70)	-.0067 (-.025)
< High School	-.5794 (-2.39)	-.8671 (-1.60)
Competing Labor Supply	3.47×10^{-8} (.03)	-1.00×10^{-6} (-.54)
Manufacturing	1.06×10^{-6} (.65)	4.77×10^{-7} (.10)
Wholesale Trade	7.40×10^{-6} (2.43)	2.20×10^{-5} (2.30)
Retail Trade	-4.30×10^{-6} (-.77)	8.03×10^{-6} (.48)
Services	-1.52×10^{-6} (-.69)	-4.24×10^{-6} (-.76)
Combined[a]	3.44×10^{-6} (2.65)	-2.69×10^{-6} (-.53)
R^2	.198	.063
Predicted/Actual[b]	.190	.120
N	632	367

T-statistics are in parenthesis. All regressions are weighted by the count of neighborhood male youths.
a. The combined industry category includes transportation, communication, other public utilities, construction and public administration.
b. The figure gives the predicted racial differential to actual racial differential using partial decompositions described in the test.

Table 6
Regressions Results and Predicted Racial Employment Differentials with Alternative Accessibility Measures

Accessibility Measures	Coefficient Estimate (t-statistic)	Coefficient on Black (t-Statistic)	R^2	Predicted % Point Differential (Predicted/Actual)
None	-	-.3379 (-5.97)	.228	-
Average Travel Time				
All Workers				
	-.0014 (-1.11)	-.3358 (-5.93)	.230	.17% (.02)
Male Youths	.0011 (.946)	-.3247 (-5.70)	.232	.05% (.00)
Ratio of Zone-Level Jobs to Workers				
All Industries	-.0003 (-.584)	-.3359 (-5.92)	.229	.00% (.00)
Manufacturing	.0060 (1.75)	-.3419 (-6.04)	.233	.02% (.00)
Blue Collar*	.0010 (.611)	-.3413 (-6.00)	.229	.00% (.00)
Ratio of Jobs to Workers Within 30 Minutes of Zone				
All Industries	-.1071 (-2.57)	-.3222 (-5.68)	.237	.45% (.04)
Manufacturing	.1943 (2.74)	-.3101 (-5.42)	.238	.71% (.06)
Blue Collar*	-.0403 (-.713)	-.3388 (-5.98)	.229	.00% (.00)

All regressions control for neighborhood average household income, the proportions of youth enrolled in school, proportions of youths that drop out, the neighborhood poverty rate, the proportion of households headed by a single parent, and the proportion of adults with less than a high school education.
* Blue collar employment is the aggregation of manufacturing, retail, and service jobs.