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4 The Spatial Mismatch Hypothesis: Are There Teenage Jobs Missing in the Ghetto?

David T. Ellwood

4.1 Introduction

Unemployment among black teenagers has reached astounding proportions. Half of all black teenagers who are out of school report themselves as looking for work but unable to find it. Another group of almost equal size say that they are neither working nor looking for work. Just 40 percent of the out-of-school black youths in this country have a job—any job. To many observers, the ghetto is the first place to look for an explanation. Even the most casual glance at the poorer sections of the nation's central cities reveals their weak economic condition. It seems quite plausible that black teenagers are trapped in blighted neighborhoods where the blue-collar, retailing, and service jobs that teenagers can perform have largely vanished. The result may be unemployment, frustration, and alienation.

This paper explores the so-called spatial mismatch hypothesis as an explanation for the poor labor market experiences of young blacks. At the core of the mismatch story is the spatial expansion of the American industrial cities. Wealthy families seeking less congestion, better services, safer neighborhoods, and a wide array of other amenities have fled the central cities, leaving behind the poor, the old, and the minorities. Industry, particularly manufacturing and retail trade, has been drawn outward by similar desires: cheaper land, better transportation networks, superior environments, wealthier customers, and to some extent, more skilled workers. What remain in the city are high-skilled white-collar jobs and low-skilled blue-collar workers. The fear is that

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the outflow of people and firms has left those least able to find and commute to employment trapped far away from the areas where new jobs are opening. In short, the young, black, urban poor struggle in a weak secondary labor market.

There are many formulations of the mismatch hypothesis. Often the formulation is influenced by its author's desired policy prescription. In this paper I hope to test whether spatially rearranging jobs in one metropolitan area would significantly improve the employment prospects of black teenagers. Logically, the question could be asked in reverse: would rearranging the residences of black teenagers in the metropolitan area improve their prospects? The problem with the latter formulation is that it would require a large number of changes. Ghetto dispersal would not only change employment accessibility, but it would also alter the social and educational environment of black teenagers. Job rearrangement would have some of these effects, but nothing like massive desegregation.

It is also important to realize that the story being tested here assumes that aggregate demand in the metropolitan area is fixed. The hypothetical experiment is not one in which new jobs are created in the ghetto. That policy would have two components: Aggregate demand in the city is increased, and the spatial distribution of employment is altered. I want to test only the effects of the latter change. The experiment is therefore one in which jobs are taken from one neighborhood and placed into another. It should be clear that whether or not the mismatch hypothesis proves to be valid, aggregate demand can affect teenage labor market performance.

This paper begins by summarizing a theoretical model that explores the necessary and sufficient conditions for the labor market outcomes of otherwise identical individuals to differ depending on their residential location within a metropolitan area. The methodological insight offered by the model is that by observing the behavior of existing workers, along with the general movement of population and industry, we can determine which groups and neighborhoods are spatially disadvantaged. The paper then explores in detail the labor market and job patterns in one metropolitan area—Chicago. Finally, this study explored in detail.

The paper shows that:

*Low skilled jobs have been leaving the city faster than low skilled workers. As a result there are now more low skilled city residents who work in the suburbs than vice versa.

*Young and low skilled blacks in Chicago spend far more time getting to work on the average than comparable whites.

*Most workers, even young workers, work far outside any area that might reasonably be classified as a neighborhood.

Blacks are being gradually disadvantaged by job movements in Chicago. At the same time the fact that most workers labor far away from home hints at a more fluid labor market than might be envisioned by a mismatch theory.

This study will explore the possible labor market effects of differences in local job accessibility by examining the relationship between job proximity and labor market outcomes in Chicago's neighborhoods. The concluding section outlines the study's findings. The findings include:

*No measure of accessibility proves to have any predictive power in employment equations for young people. Black/white differences are wholly unaffected by their inclusion.

*When we allow for fixed neighborhood effects of any type, we still have no impact on this racial differential. Indeed, the data does not reject the hypothesis of their being no spatial neighborhood effects for employment at all!

*Labor market outcomes for young blacks on the West Side ghetto are remarkably similar to outcomes for those on the South Side, in spite of the dramatic differences in proximity to jobs.

*Black and white teenagers who live in the same neighborhood fare just as differently as blacks and whites who live across town from each other!

Thus we simultaneously understand the appeal of mismatch model and its failure. Blacks really are being gradually disadvantaged by job movements. However, the labor market is wide enough geographically and fluid enough that at least by 1970, neighborhood job movements could not be blamed for much of the poor performance of minorities in Chicago. Most teenagers, black and white, don't work in their neighborhoods. And in black areas where there are many jobs for youth, white youngsters tend to fill them.

This work does show that poverty and education have a very strong influence on black teenage unemployment rates, just as they do for whites. Efforts should continue to focus on these problems. Large differences remain, however, in the outcomes of measurably similar blacks and whites. Neighborhood job proximity does not seem to account for much of these differences, at least in Chicago. Race, not space, remains the key explanatory variable.

4.2 Previous Literature

In 1968, Kain published a very influential paper in which he advanced and sought to test a "mismatch hypothesis." The author argued that housing market segregation "(1) affects the distribution of Negro employment, and (2) reduces Negro job opportunities, and (3) postwar

suburbanization has seriously aggravated the problem." He conjectured numerous links between the housing market and the labor market, links that included not only the direct effects of job accessibility, but also the influence that neighborhood characteristics might have on an employer's willingness to hire blacks. Employers with more contact and experience with blacks are presumably more disposed toward hiring them.

In his empirical work, Kain posited that there would be substantially more employment for blacks in Chicago and Detroit if neighborhoods were desegregated. That work has since come under close scrutiny. Kain's analysis clearly demonstrated that the spatial distributions of black employment and black residences were similar, confirming his first proposition. But his conclusion that black employment opportunities were therefore reduced hinged critically on his functional-form assumptions (Offner and Saks 1971). Indeed, there is something troubling about a model that predicts more employment for black workers when the number of workers used in generating the prediction is unchanged. Thus, although Kain's pathfinding work surfaced a number of tantalizing hypotheses, it left their validity largely unresolved.

Many other authors have attempted to test the mismatch hypothesis. Mooney (1969) found that nonwhite unemployment rates in different SMSAs were correlated with the percentage of area employment that was in the city and the extent of reverse commuting. But the percentage of all employment in the city would be as much affected by where the boundaries of the city were drawn as by economic forces, so that it is difficult to understand why these variables should have any predictive power. On the other side, Masters (1974) found that segregation indices did not help predict black unemployment rates in cities.[1] Although interesting, this result failed to test the mismatch hypothesis. A combination of segregation and job movement is what causes the employment problem, not merely the degree of segregation.

Most vehement in his attacks on the mismatch hypothesis has been Harrison.[2] This author has collected a variety of data that he believes show that suburbanization of employment has not increased in recent years. He has suggested that the flight of whites from the cities may even have left blacks in a stronger position for the central city jobs. Moreover, he has noted that blacks living outside the central city have incomes no higher than blacks living within the city but outside the poverty areas. This last result is difficult to interpret because Harrison explicitly selected nonpoor city blacks to compare with their suburban counterparts.

Kalachic and Goering (1970) and Danziger and Weinstein (1976) found little evidence of a wage differential between ghetto and nonghetto jobs in several cities. Recently, Straszheim (1980) has found large differ-

entials in another city. And many other authors have looked at one or another aspect of these issues.

Because this patchwork of evidence was often derived without a strong theoretical base, it remains difficult to assess the validity of the mismatch hypothesis. Comparison between cities is dangerous, since each has its own history and since jurisdictional boundaries are largely arbitrary. The hypothesis is distinctly neighborhood-based. It implies differences in labor market outcomes depending on the neighborhood a given worker inhabits. The strategy of this paper is therefore to take that distinctly neighborhood approach in one city: Chicago. I seek to explore in detail the spatial character of the labor market, with a particular focus on teenagers. I am interested in the location of jobs and workers and changes in both over time. The complexity of even one city is almost sufficient to frustrate a comprehensive treatment of the labor market. Residential and industrial locations often reflect accidents of history as much as the workings of narrow economic forces.

4.3 Summary of a Theoretical Formulation of the Mismatch Hypothesis

In a previous paper (1981) I explored a model of the spatial mismatch between workers and jobs. Actually, the mismatch story turns most urban models on their heads. Normally in these models mobile workers choose their residences with an eye toward the location of their jobs, which are typically fixed in space. According to the mismatch story, some potential workers cannot move when the jobs they might fill move away. Because there is not space to detail the theoretical model in this paper, I shall present only its key features. The model described here can be characterized as an international trade model with a twist: People can commute between zones at a cost. Urban space is divided into a series of neighborhoods. Within each neighborhood housing prices and factor costs and rewards are identical.

Workers' utility is influenced by the housing prices in the neighborhood in which they live, the wage rate in the neighborhood in which they work, and a measure of the transportation (or search) cost associated with the workers' commute.

In the simplest form of the model, we assume there are two output sectors. The price of each good is uniform across all neighborhoods. Each sector employs labor, land, and capital. Capital costs are assumed uniform and constant across zones. Wages and industrial land rents are free to vary between zones. Finally, zones may differ in efficiency of production. (Crime, distribution, or parking costs may be higher in certain neighborhoods.)

Unemployment is not explicitly modeled in this general equilibrium treatment, but the model easily captures the influence of place of res-

idence on labor market outcomes. The mismatch theory implies that labor market opportunities will differ among persons in different neighborhoods. We could just as easily model this relationship as very low wages (or wages net of transport costs) in some zones relative to others. And if we impose some wage rigidities in areas where equilibrium wages are low, we could instead have high wages and high unemployment.

In the context of this model, three forces will tend to equalize labor market opportunities across neighborhoods: the movement of people to new residences; the movement of capital or firms between neighborhoods; and the commuting of workers between zones. Thus, three conditions must be met for a mismatch hypothesis to have force:

1. Residential location decisions must be constrained. Free mobility of residences would equalize the utility of identical workers.
2. Conditions for business must be unfavorable due to either an excessive cost of production or a "shortage" of land in the same areas where residences are constrained. As a result, wage rates are low or else business leaves (or never enters) and few jobs are found in the neighborhood.
3. Commuting or search costs must be nontrivial for jobs outside the neighborhood. Otherwise, workers forced to live in undesirable areas would simply commute to jobs in other neighborhoods.

Because the results of these conditions are for the most part obvious, they receive only passing discussion here.

One confusion that easily arises in the mismatch hypothesis is the difference between labor market outcomes and utilities. The mismatch story could be construed to indicate that labor market outcomes will differ depending on residential location, whether or not utilities differ. Variables other than labor market outcomes enter the utility function. Areas with weak labor market opportunities may provide offsetting advantages. Indeed, if we consider job locations and wage rates to be exogenous, this model largely mimics the traditional Alonso (1964) and Kain (1962) models, in which land rents decline with distance from employment centers. Clearly, mismatch theorists have in mind labor market problems serious enough to create insufficient compensating advantages in housing markets. If that is the case, the mobility of the disadvantaged workers must be limited. Note, however, that a result showing differing labor market opportunities by neighborhood need not indicate any market failures. We should naturally expect some differences. But if people voluntarily choose to live in economically weak neighborhoods, we can be sure that there are offsetting benefits. It might still be interesting to explore the differences in labor market opportunities even if no limits were imposed on mobility, but utility variations can occur only when such limits exist.

Thus, at the very heart of the mismatch story are constraints on residential (and possibly workplace) location. Proponents of the hy-

pothesis argue that the residential choices of blacks are particularly constrained because of discrimination in urban housing markets, and this point arouses little dispute. I know of no author who has argued that residential choices for blacks in Chicago are unconstrained, though considerable disagreement persists about whether these constraints lead to unusually high housing costs.[3] Among teenagers, the problem of mobilty leading to identical utilities even if labor market opportunities differ by location may not be serious anyway. Over 90 percent of all teenagers live at home. They have little option about their homesites. Whatever the advantages or disadvantages of the particular homesite the parents have found, they surely will not exactly offset any job accessibility differences faced by teenagers.

The foregoing discussion notwithstanding, our attention will be on the narrow question of whether identical individuals achieve "vastly" different labor market outcomes because of their residential location. We cannot pretend to be able to distinguish completely any offsetting features in other markets. If large differences in labor market outcomes are found, it will be important to consider separately the possibility of a utility difference.

Assuming residences are constrained, we must then consider under what conditions labor market outcomes will differ widely by neighborhood of residence. It is still quite plausible that mobility of firms will cause equalization of opportunity. There will naturally be pressure for the production sector to move in such a way as to equalize access to labor and wages. The geographic labor market that fails to achieve such equality must suffer from at least two other important distortions. First, the conditions for factor price equalization must not be met. Second, commuting and search costs must be nontrivial.

The best-known theorem in international trade states quite simply that if certain conditions are met, factor prices in all countries will be identical. By extension, if these assumptions are met in labor markets, wage rates (and thus opportunities) will not differ across neighborhoods. In a two-sector model the most important assumptions are that all neighborhoods allow for equally efficient production and that both goods be produced in each zone.[4]

In our model there are two particularly pertinent cases in which the theorem may break down. If efficiency does differ depending on location, the theorem fails. Or if one or another zone has a superabundance of labor relative to land or vice versa, equalization will again be thwarted. The first condition is obvious. If it is more expensive to produce one or another product in certain locations, either factor prices must fall or production simply will not take place there. There is no a priori reason to believe that higher production costs will lead to decreases only in wage rates or only in land prices. Indeed, there are unusual cases in which one factor price actually rises. In general, though,

we can predict downward pressure on both land prices and wages. The lower limit on both prices naturally depends on the opportunity costs of the factors. If workers have strong opportunities in nearby neighborhoods, the wage cannot fall below the net wage received by the commuters. If land has other uses such as housing or speculation, the fall in rents will also be limited. Quite plainly, it is possible that production inefficiencies and opportunity costs of factors may be such that no production will occur in some areas.

Yet even if all areas allow for equally efficient production, where labor is very abundant in some neighborhoods relative to land or vice versa, the theorem may again fail. We noted earlier that the factor price theorem works only when production takes place in both sectors in a neighborhood. At the equalized factor prices, each sector will use a particular combination of land and labor. Equilibrium requires that all factors be exhausted. Thus, some combination of production of good X and good Y must allow for full use of resources. So long as the overall land-labor ratio in the zone falls between that implied by the equalized wage-land rental ratio for production of goods X and Y, we have no problem. That is, if our zone has three workers per acre of industrial land and good X uses four workers per acre while good Y requires two workers per acre, then by using half our land for the production of X and half for Y we will absorb all of the workers.

But should a zone have a land-labor ratio outside the bounds of production for X and Y, there is a problem. A zone with five workers per acre cannot produce both X and Y. When labor is too abundant, wages must fall and production (if it takes place at all) will be confined to the labor-intensive sector. There is nothing mystical here. When land is very scarce relative to labor, it is quickly used up. Prices for land rise and wage rates must fall or local employers cannot compete. Once again opportunity costs place a floor on the fall in factor prices. Wage rates therefore may not fall sufficiently in neighborhoods with large concentrations of labor to accommodate all nearby workers, and many residents may be forced to commute to other neighborhoods for work.

Equilibrium is achieved when the net wage of all residents is identical. Those who work nearby command less gross pay, but local employers must pay more for land so they make no excess profit. Those workers who commute receive larger paychecks but bear search and commuting costs. Either way, if efficiency differs by neighborhood or if there are very large differences in the ratio of land to labor across zones, factor prices and thus opportunities are likely to differ.

The final condition for differential labor market outcomes for identical residents of different neighborhoods is nontrivial commuting or search costs. We explicitly allow workers to search for and commute to jobs in neighborhoods outside their own. If the costs of doing so are

small relative to the wage, the net effect of neighborhood differences will also be small. These search and commuting costs limit the differences in opportunity across neighborhoods. In the extreme when such costs are trivial, all persons face equal labor market opportunities. Everyone in the entire metropolitan area would be attracted to any job paying a little extra. Ultimately, it is this condition that we must explore most closely. Proximity to work does vary dramatically by neighborhood. But if such variations are important to consider when exploring the labor market outcomes of young people, search and commuting costs must be very high.

Let me summarize the conditions that must be met for a plausible mismatch theory. First, there must be constraints on the residential location decisions of workers. This condition is not essential for labor market opportunities to differ by neighborhood, but it is critical for utility levels to differ by neighborhood. Second, either neighborhoods must vary in their productive efficiency or some zones must have an overabundance of labor or land, or both; otherwise, wages will be everywhere identical. Finally, commuting costs must be nontrivial.

It can be argued very effectively that the first two conditions are met for ghetto youths. The residential choices of these youths' parents are obviously constrained. Moreover, the young people themselves are essentially constrained to live at home. It also appears that production is less efficient in the ghetto and even that usable land for industry is relatively scarce.

Production costs might be higher in the ghetto for many reasons. Theft and vandalism are unusually high. Noll (1970) argues that business expansion in ghetto areas is difficult because the acquisition of space is complicated by the need to buy land from several owners, each of whom potentially occupies a monopolistic position. Hamer (1972) reports that demolition costs are high relative to the acquisition costs of unfettered land in the suburbs. Kain (1968) points to a reluctance of skilled workers, who tend to be white, to work in undesirable areas. Parking is always a problem. Finally, a congested and outmoded transportation network often hampers the movement of goods to national markets.

There is good reason to suppose that usable land may be hard to find in the ghetto. The arguments of Noll and Hamer noted above suggest not only that production is costly, but also that usable land is limited. Population densities in urban ghettos are typically the highest of any area in the SMSA. The labor-land ratio in the ghetto is obviously many times greater than that in the suburbs.[5]

The key question, then, is whether search and commuting costs for young people in the inner city are costly. And certainly, such a scenario is plausible. Transportation costs may be very high. Cars are rarely

available to poor young blacks, and the mass transportation system may not serve them well. Youths may value their leisure time very highly, implying a greater cost (relative to the wage) of commuting time than adults. An even more plausible story is one that emphasizes the high cost of initial job search outside the neighborhood. Youngsters may be unfamiliar with the transportation system they need to use to locate a job in the first place. Others may genuinely fear for their personal safety once they leave the familiar areas near home. It is widely claimed that young blacks simply will not set foot in some alien neighborhoods. Finally, the job-search process of teenagers may rely heavily on informal networks, which may dissipate with distance. I shall explore these issues in some detail later in this paper. Suffice it to say, however, it is quite plausible that commuting may impose a serious burden on many youngsters seeking work.

If the three conditions for our model are met in the ghetto, we can make three principal predictions.

HYPOTHESIS 1. *There will be downward pressure on wage rates in the ghetto.*

Whether ghetto production is less efficient or usable land is simply scarce, there will be downward pressure on wages. (For land prices, pressure will be downward if the area is less efficient and upward when land is scarce.) But wages may be constrained by the standard litany of rigidity-inducing institutions. The minimum wage, unions, government payment rules all serve to prop up wages. Firms with several plants in the region are rarely willing to offer lower wages at one or another plant. Discrimintion laws may also deter a company from offering lower wages in ghetto plants. As a result wages may not adjust downward sufficiently to provide jobs to all who seek them. Unemployment would be the inevitable result.

HYPOTHESIS 2. *Ghetto firms will tend to be labor intensive.*

The plentiful resource in a neighborhood with a depressed market is labor. The firms most likely to offset added costs of business in the ghetto are ones that can exploit this resource. The result will be more than just the obvious one that firms needing low-skilled labor will be drawn to the ghetto. This result follows from the surplus of labor in the ghetto and not from the low skills of ghetto residents. Even if all workers in metropolitan areas were identical, ghetto production—if it exists—would likely to be labor intensive.

HYPOTHESIS 3. *The ghetto will tend to export labor to other neighborhoods. Workers living in the ghetto will tend to travel farther to work than their counterparts in other metropolitan areas.*

If opportunities are more limited in the ghetto, workers will try to commute to jobs elsewhere. The greater the differential in wage rates or opportunities, the greater the incentive to commute. Thus, the weaker

the opportunities in one area, the farther the marginal worker will travel for work. This result is obvious, but very important methodologically. It suggests a way of measuring accessibility by observing the journey-to-work patterns of workers. Neighborhoods with low job accessibility will tend to export workers. Those workers will travel farther to work than their counterparts in other areas.

This model illustrates the appeal of a simple mismatch story. It can generate low wages and skewed occupational distributions without resorting to models of discrimination or of the heterogeneity of workers. Unlike discrimination models, this formulation of the mismatch story requires no noncompetitive behavior on the part of firms. No large profits are forgone. The cost of business operation is higher in the ghetto or land is scarce, and ghetto residents suffer. Indeed, the two-sector formulation of the model used here is in most important respects similar to Becker's use of a one-sector model in his landmark book (1957) on discrimination. That similar results are generated here should be no surprise.

Of course, discrimination is not ruled out in this model. Indeed, housing market discrimination is crucial to its formulation. Discrimination in the labor market could serve to exacerbate the mismatch problems. The reluctance of capital to flow into the ghetto could reflect ill feelings towards blacks rather than high real costs. If firms in or out of the ghetto refuse to hire blacks, "search costs" may indeed be high.

The appeal of the model, however, is part of the reason it is so hard to test. Low wages, skewed occupational distributions, and high unemployment can be generated by mismatch, by discrimination, and by differences among workers. The difficult task is to distinguish among these.

What is unique about the mismatch model is its emphasis on employment location. In theory, ghetto firms will pay less than nonghetto firms. Those willing to commute out can command higher wages. The occupational mix of ghetto and nonghetto firms will be different. But the heterogeneity of firms and workers bedevils easy empirical testing. The strongest result is perhaps the most obvious: Persons living in neighborhoods with weak local employment opportunities will tend to commute to other neighborhoods. If that commuting imposes heavy costs—either in initial job search or in daily commuting—persons living in these areas will fare worse in the labor market.

The basic insight, then, is to observe the behavior of existing workers to determine the neighborhood's proximity to jobs. The methodology used here is to relate neighborhood employment rates to various measures of job proximity based on the behavior of existing workers. Even here we must be very careful. Worker commuting patterns differ for many reasons. We must be careful to understand them.

4.4 Worksites, Homesites, and Commuting in Chicago

The theoretical model outlined above suggests that we ought to look at workers' differential residential and workplace locations and the commuting behavior these imply in our search for evidence for or against the mismatch hypothesis. We need to define a variety of proximity measures and to relate these to labor market outcomes in the neighborhoods in and around Chicago. Before embarking on that task, it is enlightening to consider briefly the broad employment, residence, and commuting patterns observed in Chicago.

During the 1960s the central city of Chicago experienced declines relative to the surrounding suburbs in both the number of jobs located there and in the number of workers living there. The city actually lost more jobs than working residents. In 1960 the city housed 59 percent of all workers in the Chicago (SMSA) and it held nearly 69 percent of all jobs. But by 1970, the figures had fallen to 48 percent and 53 percent, respectively. Thus, by 1970 the image of a central city that held the jobs for "bedroom" suburbs no longer applied to Chicago. Jobs and workers had achieved rough parity.

Of course overall parity did not translate into identical patterns of work and home locations for all occupations. Table 4.1, drawn from census data, reveals the changing workplace and residence patterns by occupation between 1960 and 1970. The table records both the percentage of all those employed in each occupation who lived in the city (rather than the suburbs) and the percentage who worked there. It also reports the ratio of these two, labeled the import ratio. In effect, the import ratio gives the ratio of jobs to workers in the city. If equal numbers of persons lived and worked there, the ratio would equal one. An import ratio of one does not of course indicate that there is no commuting, only that as many workers commute out of the city each day as commute into it. Since there are more professional jobs located in the city than there are professionals living there, on net the city imports professionals from the suburbs each day and the import ratio for that occupation exceeds one. By contrast, there are actually fewer city jobs for laborers than there are resident laborers, so each day the city is a net exporter of these workers and the ratio falls below one.

As we would expect, the city is a major net importer of professional, managerial, and sales personnel. What is somewhat surprising is the fact that Chicago is actually a net exporter of all of lower-skilled occupations. More operatives, laborers, and service workers live in the city than work there. Even more striking is the fact that the deterioration in the import ratios between 1960 and 1970 was greatest in those occupations. So although declines came in all workplace and residence

Table 4.1 **Worksites, Residences, and Central City Import Ratios for All Employed Persons, by Occupation, 1960 and 1970**

Occupation	% of All Persons Employed in Occupation Living in the City (1)	% of All Persons Employed in Occupation Working in the City (2)	Import Ratio (2) ÷ (1)
	1960		
Managerial	44.9	68.8	1.53
Professional	48.7	64.6	1.33
Sales	51.8	68.2	1.32
Clerical	63.9	74.6	1.17
Crafts	54.1	64.3	1.19
Operative	66.0	69.9	1.06
Laborer	67.6	67.9	1.01
Service Worker	66.3	66.5	1.01
Total	58.7	68.7	1.17
	1970		
Managerial	31.8	53.1	1.67
Professional	40.8	51.6	1.27
Sales	37.5	49.3	1.32
Clerical	52.7	58.3	1.11
Crafts	44.5	48.8	1.10
Operative	58.1	56.2	.96
Laborer	57.9	52.0	.90
Service Worker	57.1	53.9	.94
Total	47.9	52.6	1.10

Source: 1960 and 1970 census data.

categories, the city's biggest losses were in the residences of highly skilled, well-paid workers and in jobs for its low-skilled residents.

One portion of the mismatch hypothesis does appear to be verified, therefore, in Chicago. Low-skilled jobs are leaving faster than low-skilled workers, and those workers remaining in the city may be disadvantaged. This is particularly plausible for blacks, since roughly 90 percent of them do in fact live in the city and since as a group, they are disproportionately low-skilled. Indeed, other data do show that commuting patterns are quite different between blacks and whites. And low-skilled blacks do travel farther to work than low-skilled whites.

Table 4.2 is based on a special survey conducted by the Chicago Area Transportation Study (CATS) in 1970.[6] In general, urban theorists hypothesize that desires for land and other environmental amenities lead wealthier persons to live farther from the city (and their jobs) than those with more modest incomes. Thus, we should expect to see higher-paid professionals and managers commuting farther than lower-paid operatives and laborers. Interestingly enough, that is exactly the pat-

tern we can observe for whites in Chicago. White managers and professionals are slightly more likely to work in the city than are whites working in lesser-skilled occupations. But they are much more likely to live in the suburbs. As a result they average 35-minute commutes each way whereas white laborers and service workers travel 25 minutes on average. The bulk of the variation in travel times seems to be caused by differences in where the members of particular occupations live, rather than in where they work.

By contrast, most of the variation in the journey-to-work times of blacks is almost entirely the result of differences in where they work. Roughly 90 percent of the workers in each occupation live in the city. But in the lower-skilled categories a sizable fraction work outside the city. As a result commuting times are actually slightly longer among these lower-skilled blacks. And they are considerably longer than the times for comparable whites. Low-skilled blacks spend as much time commuting as professional whites.

These findings are supported by yet another source: the 1975 Annual Housing Survey (AHS) for Chicago. This survey is richer in demographic detail than CATS, but it is weaker in occupational information. Table 4.3 is drawn from the AHS data. Once again we see that lower-

Table 4.2 **Residence and Workplace Location Patterns, Import Ratios, and Travel Times for White and Black Workers, by Occupation, 1970**

Occupation	% Living in Central City	% Working in Central City	Import Ratio	Average Travel Time
		Whites		
Managerial	31.9	54.5	1.71	34.3
Professional	34.3	53.2	1.55	33.3
Sales	34.9	53.8	1.54	32.1
Clerical	45.7	57.6	1.26	31.1
Crafts	38.0	48.0	1.26	29.4
Operative	47.9	49.3	1.03	26.6
Laborer	51.6	50.0	.97	26.2
Service Worker	50.6	52.9	1.05	25.0
		Blacks		
Managerial	93.8	86.9	.93	32.0
Professional	86.9	82.5	.95	33.7
Sales	86.7	86.7	1.00	31.3
Clerical	91.9	90.2	.98	31.9
Crafts	87.3	65.8	.75	36.2
Operative	86.0	73.7	.86	34.0
Laborer	79.7	64.6	.81	33.5
Service Worker	85.9	80.2	.93	34.2

Source: Calculated from 1970 Chicago Area Transportation Survey data.

skilled whites travel shorter distances and have shorter commuting times than higher-skilled whites. Perhaps most relevant for this study is the finding that white teenagers have very short travel times, averaging only 15 minutes. And again the pattern for blacks is quite different. In the lowest-skilled categories, travel times and distances are much longer for blacks than for whites. Most dramatically, black teenagers travel much farther to work and spend much longer traveling, according to this survey. Indeed, black teenage men spend more than double the time commuting of their white counterparts, on average.

We should also keep in mind that these are average and not marginal travel times. They represent the average experience of those who received jobs. In other words, they do not necessarily reflect the commuting that would be required of the next potential worker. If nearby jobs are easier to find and are filled first, excess commuting times for the marginal black teenager could in fact be much greater. Even the average figures reported in the AHS imply that in a five-day workweek, black teens spend two and one-half more hours in transit than white teens.

This glimpse at the general patterns helps illustrate why the mismatch hypothesis holds real appeal to those interested in the problems of minorities. In Chicago, at least, low-skilled jobs are in fact moving out of the city faster than low-skilled workers. Blacks do spend longer getting to work than comparable whites.[7] And the differences are most

Table 4.3 **Travel Times and Distances to Work for Whites and Nonwhites in Chicago, 1975**

	Average Time		Average Distance	
	Whites	Nonwhites	Whites	Nonwhites
		Employed Men		
All Ages	27.4		10.8	
Household Heads, Aged 30–39 with Education:				
Less than 12 Years	25.1	33.0	9.9	12.3
12 Years	27.3	27.4	11.8	9.7
Over 12 Years	31.8	33.1	13.5	12.8
Teenagers 16–19 Living at Home	15.1	36.2	4.5	9.3
		Employed Women		
All Ages	22.4	32.8	7.2	9.2
Household Heads	25.3	36.1	7.3	9.5
Wives	21.0	33.0	7.1	9.4
Teenagers 16–19 Living at Home	16.2	28.7	4.7	6.5

Source: Calculated from 1975 Annual Housing Survey.

extreme for precisely those groups we might expect to have limited mobility and haphazard job-search methods—the low-skilled and the young. Obviously, the hypothesis merits closer examination.

Although black teens spend more than twice as long as whites traveling to work, the differences need not have a sizable impact on labor market outcomes nor do they necessarily explain a large portion of the racial differences in labor market outcomes. The extra travel time amounts to just 5 percent extra work time in an eight-hour day. Transportation economists report that commuting time is typically valued at roughly half the wage.[8] If so, even an absurdly high labor-supply elasticity of, say, two would explain only five percentage points of the 50 percent difference in the employment rates of black and white teens.

Thus, we need a model that suggests youths who live farther from jobs suffer greater disadvantages than those imposed by higher commuting costs. We need a model whereby initial job search or job acquisition is severely hampered by geographic separation from jobs. If job-search costs rose, for example, exponentially with distance because of initial transportation costs, more limited information, or fear and uncertainty about neighborhoods farther from home, and if youths did not expect to stay in any particular job for an extended period, much more significant negative effects could result.

A slight modification of this notion derives from the work of Rees and Schultz (1970) in the early 1960s. They found that low-skilled workers tended to find jobs primarily through the use of informal networks.[9] It does seem plausible that such networks would dissipate proportionately with distance from home. Thus, these low-skilled black workers might be disadvantaged in their initial job search.

There is a second aspect of these results that casts doubt on the plausibility of the mismatch hypothesis. The mean distances and the variances around them are very large. A five-mile journey brings any teenager well outside almost any conception of neighborhood. Typical walking speed is roughly three miles per hour, and therefore jobs even for white youths are over one hour's walk from home. It seems unlikely that youths would be very familiar with most of the areas within a five-mile radius. And the variances in travel times and distances are very large for all groups. It is not at all uncommon for the standard deviations to be two-thirds the size of the mean. Such a wide variance indicates a far more dynamic and wide-ranging labor market than some mismatch models might suggest.

Nonetheless, it is still plausible that job accessibility differences are important. We must therefore turn to the question whether the observed differences in job accessibility do in fact explain differences in the labor market outcomes of whites and blacks and of residents of different neighborhoods in Chicago.

4.5 Methodology

In our methodological approach to the question of spatial mismatch, we are interested in two related issues. Does proximity to jobs influence labor market outcomes? And if they do, can differences in proximity explain an important part of the racial differential in the outcomes for youth—particularly employment outcomes? The natural methodological approach is to define one or several measures of job accessibility and to examine their relationship to the employment and earnings of blacks and whites in different areas of the city. Yet serious methodological problems arise when one seeks to estimate such a model. The most serious problems concern the development of appropriate measures of accessibility. Even in simple models in which workers and jobs are all identical, the fact that wage rates, labor supply, in commuting patterns are all determined simultaneously makes it difficult to select ex post a meaningful definition of accessibility, particularly if we allow for rigidity in wages and for unemployment. When the theoretical problems are combined with a rather serious shortage of individual data that provide both detailed geographic and socioeconomic information, the prospects for appropriate estimation are discouraging.

Because of these problems, the approach taken in this paper is to use three different methods to examine the potential relationship between employment and proximity. First, census tract employment rate equations will be estimated including one of many different measures of neighborhood job proximity in each. Second, census tract employment rate equations are estimated that allow for fixed neighborhood effects and that are designed to capture the impact of all unobserved neighborhood differences, including variations in job proximity. And third, natural experiments which occur within the city will be exploited by comparing the labor market outcomes of blacks who live in neighborhoods with vastly different job accessibilities and by comparing the outcomes of blacks and whites who live in the same neighborhoods.

The first method is simply an attempt to operationalize the different models described above. A large number of neighborhood proximity measures drawn from several different data sources are defined and then used as independent variables in regression models that use as the dependent variable the youth employment rate in a very small district of the city of Chicago.

The second method uses the same dependent variables but allows instead for separate intercepts for each of over 100 neighborhoods. In essence, this method controls for all neighborhood differences regardless of their origin. Thus, the fixed effects capture the impact not only of proximity differences, but also of differences in local schools, in the

attitudes and tastes of local residents, and in anything else that varies over space.

The final approach is quite different. There are two ghettos in Chicago: one is the city's South Side and the other is the West Side. By every conceivable measure, blacks living in the West Side live much closer to jobs than those in the South. Just after the 1970 Census was completed, the Census Bureau conducted a series of Census Employment Surveys (CES) in low-income areas across the United States, for which the agency collected detailed labor information on relatively large samples of individuals. Two of those surveys were conducted in Chicago—fortunately, for our purposes, one in each of the ghettos. We can therefore exploit the natural experiment by comparing persons in these two areas in some detail and then explore the effects of job proximity on young blacks' employment experience.

We can also use these same CES data for another natural experiment. The West Side is actually a collection of several low-income neighborhoods, some black and some white. Thus, we can compare the labor market outcomes of blacks and whites living very close to each other. This second natural experiment allows us to examine the extent to which differential outcomes between blacks and whites can be explained by differences in proximity. If they can, blacks and whites will fare much more similarly in areas where they live close to each other.

The results of all these tests are remarkably strong and consistent. At best, proximity has a marginal impact on labor market outcomes—about as much as we might expect from the reduced real wage that results from commuting slightly farther to jobs. There is little evidence that spatial differences in job accessibility are a major explanation of the poor labor market outcomes of young blacks.

Let us begin, then, with a discussion of the methods used to examine the impact of various job proximity measures on employment rates.

4.5.1 Proximity and Employment

We might have considered the impact of accessibility on a wide variety of labor market outcomes, including employment status, wage rates, occupational attainment, and school enrollment. Ideally, we might like to use individual data on accessibility and other neighborhood variables in equations estimating labor supply, unemployment, wages, or schooling. Unfortunately, individual data with both detailed spatial identification and high-quality labor market performance measures do not exist. But using 1970 census tract data, we can relate employment rates for out-of-school youths in each tract to our measures of accessibility.

There are some 1,600 census tracts in Chicago. A series of weighted ordinary-least-squares (OLS) regressions were estimated. In all of the

models the employment rate for out-of-school youths aged 16 to 21 living in the tract—labeled *EMRATE*—served as the dependent variable. This variable, along with the bulk of the independent variables, was culled from 1970 census tract data. The youth employment rate is available for both men and women. The regression results reported here are for both sexes to reduce the measurement error of the dependent variable. All have also been run separately by gender, yielding essentially similar results for the two sexes except where noted in the text.

The most critical independent variables were those designed to capture the proximity of jobs to the tract and the measure of racial composition there. We are looking for two types of results. First, a strong performance by the accessibility measures would offer support for the mismatch hypothesis. And if the inclusion of proximity measures reduces the measured coefficient on race, we will have explained a portion of the racial differential.

The proximity measures are drawn from several different sources and are discussed in section 4.5.2. The remaining independent variables were derived from census data. *PBLACK* indicates the percentage of the population who are black. *PSPANISH* provides the comparable figure for those who are Spanish speaking. In addition to the racial composition variables, a variety of human capital and socioeconomic variables were included. *PSCHOOL* is the proportion of persons aged 16 to 21 who are in school and thus is a measure of the schooling level of the out-of-school group. The greater the value of *PSCHOOL*, the later people leave school, and thus the older and better-educated are the out-of-school people. Two measures of economic well-being in the tract are also included: *FAMINC*, the average family income; and *PPOOR*, the proportion of families living below the federal poverty level. The inclusion of two income measures obviously complicates the interpretation of each one separately. *PUNDER25* indicates the percentage of the tract's residents who are under 25 years of age and is designed to capture any demographic effects. *PSING* is the percentage of children living in single-parent families.

Sample sizes vary by tract, creating heteroskedasticity in the data. OLS estimates are unbiased but inefficient. Thus, all regressions were run weighted (by the square root of the sample size) and unweighted. Both procedures yielded virtually identical results, though weighting often improved precision. The weighted results are presented here. All statistical tests (including the Fischer test described in section 4.6.1) were appropriately adjusted to account for the weighting.

4.5.2 Measuring Job Proximity

Even the most casual local observer would recognize that there is enormous variability in job accessibility across the city and SMSA of

Chicago. We shall see, for example, that by every conceivable measure there is a concentration of jobs in and around the city's West Side and there is a comparable void on the South Side. Yet finding meaningful ways to quantify those differences is a difficult task.

For both practical and theoretical reasons, accessibility should not be measured separately for each census tract. Tracts are simply too small to serve as reasonable representations of neighborhood job markets. And our limited data make it impossible to create different measures for each tract. Instead, accessibility will be defined over "neighborhoods"—the geographic concept that everyone understands but no one can define. In the 1940s, Chicago planners nonetheless accepted the task of defining zones that roughly corresponded to existing neighborhoods, and they created 76 "community areas" (or community zones). Since that time these zones have been used as basic geographic units for collecting and reporting data (and delivering services). Chicago census tracts have been chosen to be simply subdivisions of these community areas; thus, tracts can be easily aggregated to the larger zones.

These community zones seemed the logical and easiest definition of neighborhoods within the city. In the remainder of the SMSA no such convenient zones have been designated. Still, census tracts or groups of tracts often conform to municipal boundaries that in most cases have real practical significance. In the areas outside the city, census tracts were combined in such a way as to create another 40 zones. The 116 zones in and out of the city were used as neighborhoods.

Obviously, no one measure of accessibility can capture all aspects of proximity. For that reason, a variety are developed and considered here. Each captures a slightly different conception of accessibility, and each offers peculiar advantages and disadvantages. The three primary measures considered here are the following: the number of jobs within a 30-minute public transit distance from the neighborhood—either for all jobs or for particular types of jobs; the neighborhood import ratio, that is, the ratio of jobs to workers in the neighborhood—either for all occupations or for a selected subset; and the average journey-to-work travel time for workers living in the neighborhood—again, either for all workers or for a particular subset.

All three measures rely heavily on the CATS data, which provide detailed geographical information on where each worker surveyed lives and works and the mode of transit taken. In addition, the CATS group developed a "SKIMTREE" that indicates the length of time a commuter can expect to spend in traveling between any two points in the SMSA if an automobile is used or if public transit is used. We now consider each measure in turn.

4.5.3 Number of Nearby Jobs

An obvious measure of accessibility is simply the number of jobs nearby. Zones closer to more jobs would be more accessible. The time it takes to traverse a particular distance varies widely between any two points in the city; therefore, a count of jobs within 30 or 45 minutes' travel time seems most appropriate. With SKIMTREE data on travel times for mass transit or automobile between any two points in the SMSA, it is feasible to combine the tree with data on workplace location to generate measures of the number of jobs within, say, a 30-minute rapid transit commute of any neighborhood.

One serious problem with this sort of measure is that it counts only jobs and takes no account of the number of people who may be competing for those jobs. If jobs are plentiful nearby, but so are job seekers, those jobs cannot be considered readily available. Suburban workers fare poorly by this measure; low job densities and weak mass transit systems place suburban residents far from most jobs. If we include auto transit in our measure, we see no better results. Suburban residents still live close to fewer jobs. But the low population densities in suburban areas mean that even though there are fewer jobs nearby, they may be more readily available. Thus, an import ratio comparing jobs to workers in an area seems like a more appropriate measure.

4.5.4 Neighborhood Import Ratio

In a previous section we compared, for various occupations, the number of jobs in the central city to the number of workers living there. The ratio of jobs to working residents was labeled the import ratio. We found ratios far in excess of one for white-collar occupations, indicating that these workers descend en masse on the city from the suburbs each day. By contrast, the import ratio for blue-collar and service workers was less than one. These workers commute out of the city for work. It seems logical to use the same concept on a smaller scale to measure job accessibility by neighborhood. We can calculate import ratios for various types of jobs for each community zone using the CATS data. Neighborhoods with more jobs than workers will import labor and exhibit an import ratio greater than one. Those with fewer jobs than workers will exhibit the reverse.

Since our focus is on teenagers, we ought to concentrate on the relative proximity of those jobs most likely to be available to them. In principle, with sufficient data we could calculate import ratios for each neighborhood based only on teenage jobs and workers. In practice, the CATS data are too limited to allow such disaggregation with much precision. Import ratios have also been calculated for two other types

of jobs and workers: first, for all occupations; and second, for blue-collar and service occupations only.

The problem with the import ratio is that it compares two stocks—workers and jobs—in a neighborhood. Yet nearby jobs may not be available to local workers. If jobs in an area are not growing, it could be argued that all existing matches between employees and employers may have already been established and that teenagers therefore cannot get local jobs. High turnover rates in manufacturing make this scenario unlikely, but it still deserves attention. Job growth is used as a measure of accessibility in this analysis, as discussed below. But an even more appropriate measure is the average travel time taken by existing workers in their journeys to work.

4.5.5 Average Travel Time

Ultimately, we seek information on the distance the marginal worker in any area must travel to find a particular job. Although we cannot calculate that distance for the marginal worker, we can for the average one. And if job turnover is high, the distinction between the average and the marginal may not be too serious.

The travel-time measure is particularly appealing because it reflects actual worker behavior. If jobs are found nearby, travel time to work will be short. If particular workers cannot find jobs in the neighborhood, their travel time will be long. The biggest measurement problems reflect the heterogeneity of the labor force. Some workers permanently attached to their firms may move far from their jobs in a search for neighborhood amenities. Their long travel times will be included in the average, even though they could find other jobs near their homes. Their travel behavior therefore may not say much about marginal accessibility. If we confine our attention to blue-collar and service workers or even to youths, among whom turnover is common, the averages are likely to be more accurate measures of accessibility.

4.5.6 Other Measures

There is a plethora of other possible measures of job accessibility. Probably the strongest candidates are those that capture job growth or decline. Employing job growth alone as a measure of job availability is inappropriate. Most jobs for teenagers are not "new" jobs; turnover and promotion create most openings. More importantly, there is a serious simultaneity bias in any job-change measure. The lack of amenities characteristic of ghettos may slowly induce firms to leave. Job decline may be the result of poverty rather than vice versa. Even when substantial employment remains, ghetto areas will look worst according to these measures.

Nonetheless, a variety of job-change variables were also tested. None performed well at all. Thus, the actual measures used and the results obtained are not reported here. The other measures that were included in the analysis are shown below. All of them are defined for community zones and were derived using 1970 CATS data on journey-to-work origins and distributions, in combination with a SKIMTREE indicating travel time, by means of transit, between all points in the area. In the regressions, these are labeled:

JOBSNEAR (ALL) = The proportion of all jobs in the SMSA that can be reached within 30 minutes of the zone by public transit.

JOBSNEAR (BCS) = The proportion of all blue-collar and service jobs than can be reached within 30 minutes of the zone by public transit.

IMPORTRATIO (ALL) = The ratio of all jobs to all workers residing in the zone.

IMPORTRATIO (BCS) = The ratio of blue-collar and service jobs to blue-collar and service workers residing in the zone.

AVTIME (ALL) = The average travel time to work of all workers living in the zone.

AVTIME (BCS) = The average travel time to work of blue-collar and service workers living in the zone.

AVTIME (TEEN) = The average travel time to work of teenage workers living in the zone.

The measures based on teenagers are included in spite of the fact that the limited sample sizes subject the estimates to considerable measurement error. The means and standard deviations of the variables used in the regressions are reported in table 4.4.

4.6 Empirical Results

4.6.1 Tract Employment Rates

Table 4.5 displays the weighted regression results, first without any accessibility measure and then with several entered individually. These particular measures are based strictly on blue-collar and service workers. Generally, the coefficients on the other independent variables are very much what we might expect. Every variable performs exactly as we would expect. The three key variables—schooing, race, and income—perform very strongly. If we increase the proportion of youngsters in school in an area from 30 to 60 percent, holding fixed all other variables, the employment rate for out-of-school youths rises four to five percentage points because, on average, those youths have more education. Poverty also shows a powerful effect. A tract where half of the families are poor suffers employment rates almost ten points lower

Table 4.4 **Means and Standard Deviations for Variables Used in Regressions**

Variable	Mean	Standard Deviation
1970 Census Tract Data		
EMRATE	0.650	0.157
FAMINC	$12,082	$3,704
PBLACK	0.222	0.380
PPOOR	0.126	0.169
PSCHOOL	0.557	0.141
PSING	0.166	0.131
PSPANISH	0.065	0.125
PUNDER25	0.542	0.089
1970 CATS Data		
AVTIME (ALL), in minutes	31.12	5.78
AVTIME (BCS), in minutes	29.58	6.3
AVTIME (TEEN), in minutes	30.60	13.9
IMPORTRATIO (ALL)	0.886	0.924
IMPORTRATIO (BCS)	1.024	1.26
IMPORTRATIO (TEEN)	0.959	1.25
JOBSNEAR (ALL)	0.048	0.043
JOBSNEAR (BCS)	0.050	0.056
1960, 1970 Where Workers Work		
IMPORTRATIO (ALL)	0.639	0.56
Δ*IMPORTRATIO*	0.054	0.166
Δ*JOBS/WORKER*	−0.004	0.146
%Δ*JOBS*	0.213	1.45

than one where no poverty exists. If such tracts also have an average family income of $10,000 less, the difference rises to nearly 15 points. Yet even after controlling for schooling, income, family composition, and age composition, race is the most significant variable. Tracts that are entirely black suffer employment rates 18 percentage points lower than those that are all white, all else the same. The coefficient on *PBLACK* is 18 times its standard error. Race is thus a powerful predictor of employment status in Chicago in 1970. The black-white differential to be explained is sizable.

In these results, neighborhoods with a large proportion of Spanish-speaking residents also fare poorly. The coefficient reported here is 78 percent of the black one. Quite interestingly, this is one of the two coefficients that are very different in the all-male employment rate equation. (The results in table 4.5 are for both sexes.) The estimated coefficient drops from .13 in these regressions to .07 when we consider employment for men only. One other value changes dramatically: that for *PSING*, the percentage of children in single-parent families. This coefficient also fades in significance for men only. Presumably, some women are not in the labor force because of marriage or family re-

Table 4.5 **Regression Results from 1970 Census Tract Data**

Independent Variable	Dependent Variable: *EMRATE* (1)	(2)	(3)	(4)
PSCHOOL	.14	.13	.13	.14
	(.03)	(.03)	(.03)	(.03)
FAMINC	$.003 \times 10^{-3}$	$.003 \times 10^{-3}$	$.001 \times 10^{-3}$	$.003 \times 10^{-3}$
	$(.001 \times 10^{-3})$	$(.001 \times 10^{-3})$	$(.001 \times 10^{-3})$	$(.001 \times 10^{-3})$
PPOOR	−.16	−.16	−.17	−.16
	(.04)	(.04)	(.04)	(.04)
PUNDER25	.09	.10	.10	.10
	(.05)	(.05)	(.05)	(.05)
PSING	−.14	−.14	−.14	−.14
	(.06)	(.06)	(.06)	(.06)
PBLACK	−.18	−.18	−.18	−.18
	(.01)	(.01)	(.01)	(.01)
PSPANISH	−.13	−.12	−.13	−.13
	(.03)	(.03)	(.03)	(.03)
INTERCEPT	.58	.58	.58	.61
	(.03)	(.03)	(.03)	(.03)
JOSBNEAR (BCS)		−.03		
		(.07)		
IMPORTRATIO (BCS)			.0049	
			(.0024)	
AVTIME (BCS)				−.0011
				(.0005)
N	1,132	1,132	1,132	1,132
Standard Error of Estimate	.094	.094	.094	.094
R^2	.642	.642	.644	.644

Note: Standard errors in parentheses.

sponsibilities. It seems plausible that regarding these two coefficients, the equations for all young people are capturing both differences in labor market opportunities in the tract and differences in other factors influencing labor market participants.

Table 4.5 also plots the performance of three of the accessibility variables. *JOBSNEAR(BCS)* is the first. If the proportion of all blue-collar and service jobs within 30 minutes of the residence captures job proximity, the expected sign would be positive. Instead, we see a negative one and the variable is completely insignificant. The failure of this measure was not unexpected, since it is a better measure of proximity in the city than outside it.

IMPORTRATIO has several advantages as a measure of neighborhood job availability. It compares jobs and workers, and it is a better indicator of job accessibility in many suburban zones than in most central city ones. We would expect a positive sign; more jobs per worker should yield higher levels of employment. In fact, the coefficient is positive and just significant at conventional levels. But the coefficient is extremely small. If we could transform a neighborhood from having two workers per job to one having two jobs per worker, the employment ratio would rise only one percentage point according to these regressions!

The average travel time for blue-collar residents of the neighborhood is also signed as expected and significant. Zones where workers spend more time getting to work have lower rates of employment among young people. But here again the measured effects are very small. Reducing average travel time by two standard deviations (12 minutes) again would boost employment by only one percentage point.

The small coefficients observed are consistent with a model in which extra commuting time lowers the real wage somewhat and thereby causes a fall in labor supply. Suppose the labor supply elasticity were 1.0 and travel time were valued at one-half the wage. A one-minute extra commuting time each way would then reduce the real wage by roughly 0.2 percent in an eight-hour day (2/480 $\times$ 50 percent). A 0.2 percent reduction in *EMRATE* with a mean of .65 translates into a decrease of .0013. This estimate is remarkably close to the coefficient estimate of .0011 on the average blue-collar travel-time variable. Obviously, the result is not consistent with a model in which the likelihood of finding a job is sharply reduced when jobs are not located very nearby.

Perhaps even more important is the coefficient on *PBLACK*. With or without the inclusion of accessibility variables, the coefficient is .18. None of the measures affects it in the slightest. These results show no evidence at all that black and white employment differences originate in job proximity.

Table 4.6 summarizes the results of all CATS-based measures of accessibility. The measures based on the number of jobs nearby fall

flat. But the import ratio and average travel-time measures are always of the expected sign and often significant. The best single measure appears to be the import ratio for all workers. Unfortunately though, the coefficients are all very small. Pushing up employment rates just one percentage point requires massive changes in the accessibility indices. These pale in comparison to the .18 point edge enjoyed by whites over blacks. Moreover, these proximity measures are uniformly impotent with respect to the *PBLACK* coefficient. None causes it even to flinch.

Accessibility shows some minor effects here. But even these results may overstate the power of the variables. These coefficients are highly

Table 4.6 **Regression Results Showing Performance of Various Job Accessibility Measures Using 1970 Census Tract Data**

Job Accessibility Measure	Coefficient on Percent Black (Standard Error)	Coefficient on Accessibility Measure (Standard Error)	R^2 (Standard Error of Estimate)
None	−.18 (.01)		.642 (.094)
% of All Jobs Within 30 Minutes' Transit	−.18 (.01)	−.12 (.08)	.643 (.094)
% of Blue-Collar and Service Jobs Within 30 Minutes' Transit	−.18 (.01)	−.03 (.06)	.642 (.094)
Import Ratio for All Workers	−.18 (.01)	.009 (.003)	.645 (.094)
Import Ratio for Blue-Collar and Service Workers	−.18 (.01)	.0049 (.0024)	.642 (.094)
Import Ratio for Teenagers	−.18 (.01)	.008 (.002)	.646 (.094)
Average Travel Time for All Workers	−.18 (.01)	−.0009 (.0005)	.643 (.094)
Average Travel Time for Blue-Collar and Service Workers	−.18 (.01)	−.0011 (.0005)	.644 (.094)
Average Travel Time for Teenagers	−.18 (.01)	.0000 (.0002)	.642 (.094)

Source: 1970 Census Tract data (1973) and 1970 Chicago Area Transportation Study.

Note: Other variables include percent Spanish-speaking, percent high school graduates, percent of persons in tract over age 25, average family income, percent of persons in poor families, and percent of children in single-parent families.

unstable. Many more are insignificant in the male-only regressions. Other regressions using job-change data also fail to show any impact of accessibility. And the unweighted estimates are rarely significant. It is simply impossible to find strong effects with these variables.

It is plausible that accessibility is a far more important factor in black than in white households. Informal job networks may provide whites with access to jobs over a larger geographic area. Blacks are not blessed with such extensive networks and may be more at the mercy of the neighborhood job situation.

Table 4.7 provides results using tracts with greater than 50 percent blacks only. Several interesting results appear. The one of the most immediate concern is the recurrent failure of the proximity variables. Signs are often reversed, and none of the coefficients is significant. Average travel time performs best here, but once again there are only small effects. The entire arsenal of CATS-based variables are meek. Proximity as captured here explains little of the unemployment in predominantly black tracts.

There is another perhaps more telling finding, however, *PBLACK* was included because a few of the tracts had small white populations. Typically, these tracts span ghetto boundaries. The thought-provoking finding in table 4.7 is that the coefficient on *PBLACK* is almost as large as it is for all tracts. The only whites in this sample live in the ghetto or at its borders, yet tracts with more whites have better employment rates. This finding suggests that black-white differentials within neighborhoods are almost as high as differential for blacks and whites living across town, after we have controlled for income, schooling, and the like. If so, neighborhood differences cannot really explain the relatively poor performances of young blacks. We shall return to this issue momentarily.

We have tried a wide array of job accessibility variables. Most have performed poorly. Although they usually have the expected sign, their magnitudes are typically very small and many are insignificant. At best, the magnitudes seem consistent with a model that suggests extra commuting time reduces the real wage and thus reduces labor supply. Not a single one of them explains anything of the black-white differences. Surely, this performance offers little support for the hypothesis that a major reason why blacks perform poorly in the Chicago labor market is their isolation in neighborhoods with low job proximity. We are always confronted with the nagging problem, however, that we may simply have missed the true differences in accessibility across neighborhoods. It seems appropriate, therefore, to turn our focus to a more fundamental level to explore, namely, just how big the neighborhood effects of whatever origin are, once we have controlled for a few basic socioeconomic variables.

Table 4.7 **Regression Results for Tracts With 50% or More Blacks**

Job Accessibility Measure	Coefficient on Percent Black (Standard Error)	Coefficient on Accessibility Measure (Standard Error)	R^2 (Standard Error of Estimate)
None	−.15 (.07)		.488 (.100)
% of all Jobs Within 30 Minutes' Transit	−.15 (.07)	−.001 (.196)	.488 (.100)
% of Blue-Collar and Service Jobs Within 30 Minutes' Transit	−.15 (.07)	.073 (.146)	.489 (.100)
Import Ratio for All Workers	−.15 (.07)	−.003 (.008)	.488 (.100)
Import Ratio for Blue-Collar and Service Workers	−.15 (.07)	−.0002 (.0044)	.488 (.100)
Import Ratio for Teenagers	−.15 (.07)	.0048 (.0040)	.491 (.095)
Average Travel Time for All Workers	−.14 (.07)	−.0017 (.0013)	4.92 (.099)
Average Travel Time for Blue-Collar and Service Workers	−.13 (.07)	−.0017 (.0013)	.492 (.099)
Average Travel Time for Teenagers	−.15 (.07)	−.0010 (.0006)	.496 (.099)

Source: 1970 Census Tract data and 1970 Chicago Area Transportation Study.
Note: Other variables are as listed in table 4.6, n.

4.6.2 Fixed-Effects Models

When employment rates by census tract are displayed on a map, we can observe sizable differences across neighborhoods. Knowing only a youngster's neighborhood would help us greatly in making predictions about his or her likely employment status. But it would also aid us in predicting the youth's race, education, and family income. We would like to know whether significant neighborhood differences remain after having controlled for the usual list of socioeconomic variables. Indeed, we would most like to know whether the strength of such socioeconomic variables such as race or income can actually be traced to neighborhood effects that are correlated with these variables.

We can explicitly allow for fixed neighborhood effects by providing each community zone with its own intercept. These intercepts will control for all the differences between *zones*; the only information that remains comes from differences in outcomes *within* community zones. When we examine the regression results for a fixed-effects model, we are exploring only the effects of particular independent variables within neighborhoods.

The results of this experiment are astonishing. The coefficient on *PBLACK* does not fall; it actually rises to .22. There is only one possible inference: blacks and whites in the same community zone fare as differently as blacks and whites across town from each other. Remember, there are 76 community zones in the city alone. Within these small areas there is a *larger* racial differential than between the zones. No wonder the proximity measures failed to influence the *PBLACK* coefficient. Perhaps this result should not have been a surprise. After all, even in the predominatly black tracts of the earlier analyses, race seemed just as important as an explanatory variable. We can infer that no measure of accessibility, however conceived, that is defined by community area will account for black-white differences.

Perhaps the most remarkable result of all is that deriving from the traditional Fischer test for equality of coefficients, which can be used here to test whether the hypothesis of no neighborhood effects (equality of intercepts) is rejected by the data. The restriction of a uniform intercept is *not* rejected. This result is extraordinary. There are so many reasons to expect neighborhoods to differ, quite apart from accessibility, on the measured independent variable that we certainly would have expected the data to fail this test. We find small neighborhood effects from whatever origin.

Nonetheless, it is important not to overrepresent the power of this finding. The definition of neighborhood used here—community areas defined in the 1940s—may not conform well to current distinctions among neighborhoods. The fact that these neighborhoods jointly yield no significant effects does not mean some other geographic configuration would not. Nor does the result imply that none of the individual neighborhood effects is significant—they are only jointly impotent. Still, the total lack of impact on *PBLACK* and the visual and statistical failure of neighborhood effects using the city's own designations of neighborhoods cast serious doubt on the significance of the mismatch story.

We can restate the findings in another way. If a particular youth's level of schooling, family income, or race are unknown, knowing his or her neighborhood will help in predicting how they will fare in the job market, but if we do know these basic socioeconomic facts, knowing the location of their neighborhood will still not tell us very much.

The 1970 employment-rate regressions are not at all supportive of a hypothesis blaming weak the labor market performance of blacks on

their segregation into neighborhoods with weak labor demand. None of the job accessibility measures serves to support that claim. Even allowing for a great many fixed neighborhood effects, we were unable to reduce the *PBLACK* coefficient, after controlling for schooling and income. These tract data therefore cast serious doubt on the mismatch story. Individual data from the Census Employment Survey (CES) controvert the hypothesis even more seriously.

4.6.3 Comparisons of the South and West Sides

According to the Northeastern Illinois Planning Commission the 11 community zones within Chicago that lie south of the Loop provided fewer than 5 percent of the city's jobs in 1970, whereas the *three* community zones in the West Side ghetto had more than three times as many jobs. Every single measure of proximity we defined also shows that the West Side has much better proximity to jobs than the South Side does. Indeed, the West Side typically offers among the best accessibility levels, and the South Side the worst, in the entire SMSA.

A drive through the black ghettos of the West and South Sides is just as revealing. From almost any block in the West Side, large, mostly industrial smoke stacks can be seen. (Not all are still in operation.) Located right in the center of the West Side, the international headquarters of Sears could be found in 1970. The complex occupied several city blocks. The company conducted office, warehousing, and sales functions all at that site. Sears moved its headquarters to the downtown Sears Tower in 1972, but even today Sears maintains the site as a warehouse and distribution center. On the eastern half of the ghetto is a large complex of hospitals, which are traditionally a good source of low-skilled jobs for service workers, such as cleaning, food preparation and distribution, and orderly services. On several borders and extending into the ghetto are old industrial parks. Brocks Candy, Westinghouse, General Electric all have manufacturing plants in and around the area. The only smoke stacks on the South Side are those of schools and churches. The South offers only two sources of employment: small commercial establishments along a few streets and the University of Chicago.

In short, the two ghetto areas present a marvelous natural experiment. For many reasons, the CES is ideal for our purposes. It was conducted right after the 1970 Census. Separate surveys were conducted on the West and South Sides of Chicago. Blacks and whites in low-income neighborhoods were surveyed, and the survey was designed particularly to gain labor market information.

We have already seen that measures of job accessibility explain little of the variation in employment rates for young people in entirely black census tracts. Since much of the variation in accessibility is between the West and South Sides, we have already implicitly exploited the

natural experiment and found little support. The CES data allow a much more explicit test, offering a clear window through which to view the effects of economic history.

West and South Side data were drawn from low-income census tracts. Thus, the sampling technique corrects for the most important explanatory variable besides race. It is very revealing simply to compare the average labor market outcomes in each area. Since we have excellent information on individuals, we can compare not only employment rates, but also unemployment patterns, school enrollment, occupational mix, wage rates, and journey-to-work times between the two sides of Chicago.

Table 4.8 shows unemployment rates, employment rates, educational attainment, and travel times for blacks in each ghetto area. The similarity in outcomes is remarkable. Half of the out-of-school youths in each ghetto had jobs in 1970. Two-fifths of those without a high school degree worked in each area, although the West Side does edge out the South ever so slightly. But these figures are based on only about 100 observations in each area. Standard errors for the employment and unemployment rates are roughly five percentage points. In these figures, the employment and unemployment rates never differ by more than three percentage points. And we would expect the reduced real wage on the South Side to induce small differences in labor supply.

The picture here is one of equal depression on both sides of the Loop. Fully half of the school dropouts in both areas reported that they were interested in work but unable to find it. School attainment

Table 4.8 **Comparison of Employment and Unemployment Rates, Educational Attainment, and Travel Times for Out-of-School Black Men Aged 16–21 in Very Low-Income Neighborhoods on the South and West Sides of Chicago, 1970.**

	Ghetto Location	
Dependent Variable	South Side	West Side
Unemployment Rate		
All	.38	.35
High School Dropouts	.50	.48
Employment Rate		
All	.51	.54
High School Dropouts	.38	.41
Educational Attainment		
Proportion High School Dropouts	.61	.66
Travel Time		
All	36 minutes	29 minutes
High School Dropouts	35 minutes	25 minutes

Source: Census Employment Survey, 1970.

differed slightly in the two areas (the differences are not statistically significant), but roughly two-thirds of the out-of-school youths aged 16 to 21 were dropouts in both places. (This does not imply that the dropout rate was 67 percent). The problems look severe, and they look equally severe in each area.

Indeed, the only variable in the table that shows a marked difference between the two areas is travel time. Youths on the South Side spend 25 percent more time getting to work. The differences are especially pronounced for dropouts. West Side dropouts spend 25 minutes commuting to their jobs, while their South Side counterparts need 10 extra minutes to reach theirs. The earlier description of job proximity is again confirmed here. South Side residents must travel much farther to their jobs; they do, in fact, live farther away.

Occupational patterns in the two areas also appear unusually similar, as shown in table 4.9. Even though sample sizes are quite small, nearly equal proportions of young people in the two areas are working as managerial and professional workers, craftsmen, operators, transport workers, and laborers. Only the clerical and service occupations show some divergence. Sough Side workers more commonly work in clerical positions. A chi-squared test comes nowhere near rejecting the hypothesis that the areas are identical. Finally, there is the matter of wage rates. South Side residents appear to have better rather than worse jobs by this yardstick.

The differences in labor market outcomes are very small. Whether you travel south or west from the Chicago Loop, you will find similar employment problems. Considering the fact that simple journey-to-work costs vary between the areas, it is all the more surprising that

Table 4.9 **Comparison of Occupational Mix and Wage Rates for Youths 16–21 in Low-Income Neighborhoods on the South and West Sides of Chicago, 1970**

	Ghetto Location	
Occupation	South Side	West Side
Managerial and Professional	3.9%	3.5%
Crafts	9.8%	8.6%
Operative	33.3%	35.3%
Transport Worker	5.9%	4.3%
Laborer	15.7%	17.2%
Clerical	17.6%	11.2%
Service Worker	13.7%	18.1%
Other	0.0%	1.8%
Average Wage Rate:	$2.92	$2.75

Source: Census Employment Survey, 1970.

there are not at least some differences. In fact, there are some small effects. If we accept the point estimates, South Side residents do work a bit less (3 percentage points or 6 percent), attend school a little longer, and demand or command a slightly higher wage than West Side inhabitants. The differences in proximity are slightly higher than we might have expected based on the real-wage effect of a 10-minute longer travel time for South Side residents. Nevertheless, the results do not suggest that a major impact of job proximity on employment is indicated by the modest effect of transportation costs on the real wage.

More sophisticated comparisons can also be performed. I have specified human capital wage equations, conventional schooling equations, and labor-supply and unemployment models and estimated them separately for each area. Because the sample sizes are small, the coefficients tend to be somewhat unstable, but Fischer tests are rarely failed. When pooled regressions are run that include a West Side dummy variable, that variable is almost always insignificant, though it occasionally shows a slight edge for the West Side. After controlling for the conventional labor market variables, outcomes remain remarkably similar.

We have once again turned up virtually no evidence in support of the mismatch story. We had what appeared to be the purest of natural experiments: measurablly identical populations in measurably different labor markets. The labor market results were *not* measurably different.

4.6.4 Comparisons within the Same Neighborhood

There is one natural experiment that offers even more compelling evidence. Fundamentally, the mismatch story is an attempt to explain racial patterns of employment by differences in residential locations. The cleanest experiment of all, then, is to compare employment patterns for different racial groups who live in the same location. The CES once again provides the opportunity.

Poor neighborhoods in the South Side are almost entirely black. But in the West and near-northwest live both blacks and whites. The West Side survey covered both whites and blacks living in close proximity.

Table 4.10 shows the employment and unemployment rates of out-of-school men living in the surveyed low-income area. Once again, the data are quite startling. In each age group, considerably more whites than blacks have found work. Among young people the differences are particularly extreme. Nearly 80 percent of the out-of-school whites are working, whereas only just over 50 percent of comparable blacks are. Here in the West Side, the black youth unemployment rate is 35 percent, while whites suffer only 11 percent unemployment.

The table also reveals that differences cannot be attributed to the level of education. In the younger cohorts, a greater proportion of

Table 4.10 **Unemployment and Employment Rates for White and Black Out-of-School Men Living in Poor Neighborhoods on Chicago's West Side by Age, 1970**

	Age			
Dependent Variable	16–21	22–29	30–39	40–65
Unemployment Rates				
Whites	11.0%	7.6%	3.9%	4.3%
Blacks	35.1%	21.3%	11.5%	6.7%
Employment Rates				
Whites	79.4%	88.8%	91.2%	77.1%
Blacks	54.3%	73.3%	78.9%	72.3%
Percent High School Graduates				
Whites	29.4%	42.1%	33.3%	29.9%
Blacks	33.7%	57.0%	31.3%	20.9%

Source: Census Employment Survey, 1970.

blacks than whites had graduated from high school. This result may reflect greater outmigration by better-educated whites. If so, the results are all the more compelling. Those whites who remain behind are likely to be the ones least effective in their job-search behavior.

I have run regressions comparable to the census tract, employment rate equations for individuals in the CES. A simple OLS regression was run on a dichotomous employment-status variable (1 = employed). The coefficient on race (1 = black) was −.20. Controlling for everything possible given the data, being black dampened employment prospects by 20 percentage points over whites *in the same area*. The −.20 coefficient is virtually identical to the .18 coefficient we found for black versus white tracts across the SMSA. Thus, the problem isn't space. It's race.

And this result is verified by yet another source: a very recent survey conducted by Jon D. Miller for Chicago United, a socially active group of prominent business people. The survey was limited to a few low-income areas within the city. Teenagers, black and white, were surveyed in each area. The results were again startling. Using the U.S. Burear of Labor Statistics (BLS) methodology, Miller found unemployment rates of 65 percent for black youth, 29 percent for Hispanics, and 13 percent for whites all living in low-income areas. Although the figures for blacks are surely higher than we would expect in a standard BLS survey, the differences between low-income black youths and white youths in these neighborhoods are dramatic.

Perhaps the strongest piece of evidence that race, not space, explains unemployment comes from looking at maps of employment rates and racial mix. A comparison of a map showing youth employment rates

by census tract and one showing the percentage of the population who are black uncovers remarkable similarities.[10] Areas with low teenage employment rates and those with predominantly black residents are almost perfectly congruent. For example, the area to the north of the eastern half of the West Side is predominantly poor white and Hispanic, and simply moving across a street to a black tract moves the unemployment rate from below 30 percent to over 60 percent. The same pattern appears at almost every border of the black areas. There is a black ribbon running from the West Side to an area just south of the Loop, and there is an identical ribbon of low teenage employment levels. The teenage employment rates are not based on very large samples, so we can expect considerable variability. That the employment rates and racial composition should be so closely matched is therefore all the more surprising. Blacks and whites in similar economic circumstances in very similar locations fare very differently.

It is no wonder that models with job accessibility measures and even fixed effects failed to budge the *PBLACK* coefficient. Where blacks live, employment rates are low. Across the street where whites reside, they are higher. No variable, however clever, can make that result disappear.

4.7 Conclusion

We have explored in detail the spatial dimensions of one labor market. Low-skilled jobs in Chicago are moving to the suburbs faster than are low-skilled workers. Young blacks do spend longer getting to work than young whites do, considerably more. And most workers, even young workers, work for outside any area that might reasonably be classified as a neighborhood. Yet all of the attempts here to find a substantial impact of job accessibility on labor market outcomes lead to the same conclusion: accessibility matters only slightly—about as much as would be expected from a slightly lower real wage caused by extra commuting time. There is no evidence that any important part of the black-white differential in employment rates can be traced to differential residential proximity to jobs. Black and white teenagers with comparable measured characteristics do just as differently when they live next to each other as when they live far apart in areas with dramatic differences in job accessibility.

Based on these results it is possible to understand both the appeal of the mismatch story and its failure. Blacks are being gradually disadvantaged by the movement of jobs—at least in Chicago. But the labor market is large enough geographically and fluid enough that these outward movements of jobs do not appear to cause substantial dis-

advantages to those who remain behind, except that on average they must commute farther to work.

The results here are only for one city, of course, though preliminary results from other cities suggest the results also apply elsewhere. And data from Chicago have been used by mismatch supporters in the past. Chicago has all the symptoms of the mismatch disease. The disease just does not seem to be the cause of the many labor market pains of black teenagers.

Notes

1. See also Offner and Saks (1971).
2. See especially Harrison (1972) and Harrison (1974).
3. See, for example, Kain (1980) and Berry (1976).
4. The theorem also requires that production functions be homogeneous of degree one and that the same sector always be more labor intensive than the other, regardless of the ratio of the wage to land rent. For more than two sectors, the conditions are considerably more complicated.
5. There is considerable debate over a possible inner-city land shortage. For some discussion, see Harrison (1974).
6. The sample of some 20,000 workers in the metro area is unique in that it contains detailed information on residence and workplace locations for the individuals included. When calculating import ratios for the city by profession, we find results very similar to those found in table 4.1, which are based on census data.
7. Many authors have found that blacks have longer travel times. In every category in which they reported results for blacks, Rees and Schultz (1970) showed far greater travel distances for black than for white workers in Chicago. Theirs was a nonrandom sample of firms, however. Deskins (1972) found longer travel times for blacks in Detroit. Meyer, Kain, and Wohl (1965) uncovered racial differences in Chicago and Detriot, and Greytak (1974) argued that blacks and whites behave very differently.
8. See, for example, Beesley (1973) and Hensher (1976).
9. See also Stevens (1978), Youthwork (1980), and Rosenfield (1977).
10. These maps are available from the author.

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Comment

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David Ellwood has accomplished at least three very good things here. First, he has chosen an interesting question with substantial policy implications. Second, he has gone to great lengths to assemble new

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and appropriate data to test the question. Third, he has not rested content with one test on one set of data, but instead has carefully cross-checked his work with a variety of innovative tests on related data. It is unusual to find a paper that combines these three virtues. In my opinion, Ellwood's work is the best so far to address the mismatch hypothesis for youths, and his work will serve as a basis for further research. Given the clarity with which it poses questions and the quality of its tests, the paper provides a useful base from which to discuss, first, the difficulties of empirically analyzing urban labor markets and, second, the puzzles and paradoxes posed by the mismatch hypothesis.

In one of its forms, the mismatch hypothesis states that inner-city blacks, especially the young, suffer high unemployment in part because the jobs they are suited for are far from the ghetto. Moreover, this unemployment problem is expected to worsen as blue-collar jobs continue to move to the suburbs, as residential segregation or inadequate transportation makes it difficult for blacks to follow the jobs.

The key variable here is the number of available jobs. It would seem a simple and straightforward task to measure labor demand relative to supply. It is not. This task presents formidable theoretical and empirical challenges, not all of which have been overcome by Ellwood's analysis.

My criticisms of "The Spatial Mismatch Hypothesis" primarily concern the direct tests of the impact of job proximity and availability displayed in table 4.5. First, I suspect all of the job availability measures used here are of relatively low reliability because they are based on the Chicago Area Transportation Study. It is hard to tell how representative this sample of about 20,000 workers is. Since the job availability measures are defined for 116 zones, they are based on roughly 172 workers per zone. Of these 172, the number holding jobs that a teenager might hold must be smaller, so the analysis depends on data from small samples. Measurement error is likely to affect the dependent variable, too, since the percentage of out-of-school youths in a census tract probably numbers in the hundreds, or in the tens for a 5 percent sample. Unfortunately, Ellwood had little or no alternative to using these data, and he is to be commended for his innovative use of them. Future researchers do have an alternative, however: the 1980 Census Urban Transportation Planning Package, a data set tailor-made to extend the analysis of spatial questions, including the mismatch hypothesis, to most major urban areas in the United States.

The inevitable data problems aside, we also face a theoretical problem. How can we begin to think about the jobs available to the teenage black on the South Side of Chicago? Ellwood uses three measures of job availability, and as he notes, these average measures for the employed may not indicate the experience of the marginal worker. Consider these three measures in turn.

First is the number of nearby jobs, a count of jobs within, for example, 30 minutes of the residence. But as the author recognizes, what we need is a measure of demand relative to supply, and here arises the difficulty. One could imagine counting the number of competing workers living within the same 30-minute travel radius and calling this labor supply, but this measure could only be a flawed and rough approximation. Consider the man living on the edge of that 30-minute circle: his relevant labor demand would be given by yet another circle, a different market. We could easily go from coast to coast this way. Except for a limited class of monocentric distributions that quickly reach limits, this type of problem has largely been intractable so far.

Ellwood proceeds to two other availability measures in table 4.5. The import ratio is better than the preceeding measure, but it misses an element of choice. The logic behind this measure implies that because the suburbs export workers, the employment-population ratio there must be low and the import ratio in the central city must be high. But if there is employment discrimination, many inner-city jobs may not be available to blacks.

The third measure, travel time, again misses the issue of choice. In table 4.5, a higher average travel time is supposed to reflect the lack of local jobs, so the mismatch hypothesis predicts that zones with higher average travel times will have lower employment rates. But no one would expect, as this logic suggests, that zones of suburban whites with high travel times would have low employment rates. The same long commuting time that reflects choice on the part of suburban whites may also reflect the constraint of residential segregation affecting blacks. Although criticisms can be made of each of the availability measures used in the paper, it is far more difficult to recommend a better operational alternative.

One might also wish to see different specifications of the regressions in table 4.5, the only ones fully reported. For example, the proximity variables are defined only for groupings of the neighborhoods, but the regression is run on 1,132 tracts. (What happened to the 400 other tracts?) This specification will tend to give high standard errors on the proximity measures, since they are held fixed across tracts within neighborhoods while the employment rate varies.

As with any specification, one can argue that table 4.5 contains both too many variables and too few. If proximity affects adults as well as teenagers, we can expect the family-income variable to pick up part of the true effect of proximity. Interactions of the percentage black with the proximity and education measures might also be useful. A comparison of tables 4.5 and 4.7 shows evidence of nonlinearity: the coefficient on the percentage black is smaller, and of marginal significance, in the more heavily black neighborhoods.

The estimation of neighborhood effects may contain too many dummy variables, resulting in "fratricide," or econometric "dense pack." Should we really expect each of the neighborhoods outside the city, comprising one-half of the total, to differ from the other?

But Ellwood's conclusion does not rest on the regressions in table 4.5 alone. The author also presents a creative array of "natural" experiments, which taken together are quite compelling. Since most are based on small samples, none are claimed to be significant. For example, the CES results based on roughly 100 observations per zone can at best be suggestive.

The evidence from boundary neighborhoods, neighboring black and white districts, seems particularly telling, but one's interpretation may again depend on the underlying possibilities for choice. The comparison may be of whites who have chosen to stay near their jobs and blacks of limited residential mobility. If residential segregation constrains blacks but not whites, the movement of whites may result in lower unemployment rates in white than in nearby black districts. If there is strong employment discrimination in addition, proximity need not indicate availability. The job across the street might as well be on the moon as far as blacks are concerned.

What then do we know about the mismatch hypothesis? Ellwood's results are not unique. Using a national Current Population Survey sample, Price and Mills (1983) reached a similar conclusion. They found that only 6 percent of the black-white earnings differential could be explained by the greater concentration of blacks in the central city, whereas at least 15 percent was due to employment discrimination. Adding support to this view is Meyer and Gomez-Ibanez's (1981) review of a number of studies of transit demonstration projects funded by the federal government in the aftermath of the 1965 Watts riots. These studies tested the hypothesis that improved bus service to outlying employment centers would reduce inner-city unemployment. Meyer and Gomez-Ibanez concluded that "there was little evidence that many jobs were found because of the new bus service. . . . When compared with racial discrimination or lack of skills and education, employment decentralization and inadequate or expensive public transportation appeared to be relatively minor causes of unemployment (or underemployment) among low-income central-city residents"

The decentralization of jobs continues, and as it does inner-city employment rates, particularly for blacks, continue to fall. The situation Ellwood describes has grown worse in Chicago since 1970. In my own study (1983) of Chicago and Los Angeles between 1974 and 1980, blue-collar jobs moved farther away from the ghetto in Chicago but the average employed black moved closer. Blue-collar employment is in decline in Chicago, except in the suburbs more than five miles from

the ghetto border, but the black employment share is also declining slightly outside the ghetto.

For all the mobility that Ellwood observes, the best predictor of the black employment share at a given establishment is not an indicator of employment discrimination, such as a Title VII suit, or of government pressure under affirmative action, but rather simply the distance from the ghetto. Ellwood finds that the average employed black commutes roughly 10 miles to work; but in establishments 10 miles from the ghetto, the proportion of black employees falls by half. And Chicago employment has not become more racially homogeneous across geographic zones. In that city, the impact of distance from the ghetto on the black employment share increased during the late 1970s as jobs dispersed, and the distribution of black employment came to resemble more closely the distribution of black residence, as black employment collapsed in the direction of the ghetto.

What happens to black employees when their jobs move to the suburbs? In a recent sophisticated analysis, Kain and Zax (1983) found that when an integrated firm moved from the central city to the suburbs, black employees were significantly less likely to follow and keep their jobs. Similarly, working from a complex theoretical base, Straszheim (1980) uncovered a positive wage gradient, or lower wages in the central city, for black but not for white workers with low levels of education. He concluded that this is persuasive evidence in support of Kain's view (1968) that residential segregation reduces employment opportunities for blacks.

Taking these studies together, we are still left with a paradox. Spatial considerations can explain a good deal about where blacks work, but they have not yet been shown to explain whether blacks work.

I commend Ellwood for his great efforts in framing the questions, for digging for data to answer them, and for pursuing a number of innovative tests. His paper establishes a useful framework on which future work can build, in particular by extending his analysis to other cities and other times. It seems race is important in explaining employment, even within neighborhoods. Now we must discover why that is.

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