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A Review of the Spatial Mismatch Hypothesis: Its Impact on the Current Plight of the Central City in the United States

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FOREWORD

This paper reviews 22 years of research on the spatial mismatch of urban residence and the location of employment opportunities. Beginning with the paper by Kain in 1968, the hypothesis is that blacks, trapped in the central city due to racial discrimination in the housing market, do not have access to the jobs being created in the suburbs. Kain found that the residential segregation of blacks contributed strongly to their unemployment. Research on this very complicated hypothesis is beset by numerous data and conceptual problems. Researchers have challenged Kain's findings, citing racial discrimination in hiring and macroeconomic factors as far more important than spatial mismatch for limiting the job opportunities of blacks. Others find evidence supporting the spatial mismatch hypothesis. In this paper the author also reviews the recent evidence that is based on micro-data and on modern econometric techniques. The author identifies some gaps in the literature and discusses a more complete research agenda on this topic.

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Michael Wasylenko
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May 1990

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A REVIEW OF THE SPATIAL MISMATCH HYPOTHESIS: ITS IMPACT ON THE CURRENT FLIGHT OF THE CENTRAL CITY IN THE UNITED STATES

Laura A. Wheeler

Introduction

The spatial mismatch hypothesis states that there is a discordant spatial arrangement between the location of firms and the location of low-skilled workers. It is generally presumed that the present spatial arrangement disproportionally affects central city residents[1] and is, in part, responsible for the low rates of employment among lower-income central city residents. These residents, typically characterized by poor educational attainment and low occupational skills, have traditionally found employment in low-skilled manufacturing jobs that prior to World War II were located in the central city.[2]

During the past decades, the deterioration of the inner cities has accelerated. There has been increasing migration of jobs from the inner city to the suburbs.[3] The white and black

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[1]This paper uses the terms central city, city center, and inner city interchangeably. This location is defined by the census as the largest incorporated place within an SMSA or urbanized area.

[2]For example, 35 percent of the black men in the labor force in 1959 were employed in construction, mining, and manufacturing. Gerald Jaynes and Robin Williams, Jr. (eds.), *A Common Destiny: Blacks and American Society*, National Research Council, Committee on the Status of Black Americans (Washington: National Academy Press, 1989).

[3]There is much debate as to why and when this out migration of jobs began to occur. One argument proposed by Cramer and Woodbury was that WWII halted the process of job suburbanization which was already underway by restricting new investment in plant and equipment. Thus increased production during the war had to take place in existing plants which tended to be more centrally located. Therefore, the migration of jobs to the suburbs occurring after WWII was only a continuation of a prior trend. Kain points out though that while private investment was constricted, public investment was not and a significant amount of new public investment occurred in the central city during this time indicating that the post war migration was a new trend. See John F. Kain, "The Distribution and Movement of Jobs and Industry," in *The*

middle income classes have also moved out of the central city leaving behind a segregated and impoverished black community. There has been over these last twenty years a large increase in the number of female-headed households and an increase in the number of children and adults living in poverty in our nation's central cities. Spatial mismatch, it is alleged, exacerbates the poverty resulting from these socioeconomic trends.[4]

The mismatch hypothesis, first introduced in 1968, incorporates several elements of the change which has occurred in the inner city, specifically the movement of jobs and middle income whites to the suburbs. The spatial mismatch hypothesis states that housing market discrimination in the suburbs restricts inner-city residents' access to the suburban labor market and hence, in the presence of job migration to the suburbs contributes to the decline in the economic status of inner-city residents. The jobs moving to the suburbs were the traditional source of employment for low-skilled inner-city residents. With this source of employment largely absent from the central city, inner-city residents are forced to seek employment outside their residential neighborhoods, incurring higher commuting costs and lower net wages for their work effort. In addition, it is thought that the surplus labor pool existing in the inner city drives down the wages of the remaining inner-city jobs.

The validity of the spatial mismatch hypothesis is dependent upon three factors. First, low-skilled employment opportunities have left the central city for the suburbs. Second, housing market discrimination creates a barrier to the suburban housing market for minority individuals.

Metropolitan Enigma, edited by James Q. Wilson (Cambridge: Harvard University Press, 1968), pp. 79-114.

[4]John D. Kasarda, "Jobs, Migration, and Emerging Urban Mismatches," in *Urban Change and Poverty*, edited by M. McGeary and L. Lynn (Washington: National Academy Press, 1988), pp. 148-198.

There exists much evidence to support this premise.[5] In addition, there is also a body of literature which states that housing market discrimination drives up the price of housing located in the inner city.[6] Third, individuals residing in the inner city have poor access to the suburban labor market. Statistics reveal low rates of automobile ownership among inner-city residents. In addition, public transportation is often inadequate for purposes of reverse commuting. Moreover, other researchers have found that information concerning job opportunities fails to travel long distances.[7] This is particularly true when the job opportunities are not highly skilled and there exists an adequate and qualified labor pool in the suburbs.

This paper examines the literature and empirical verification of the spatial mismatch hypothesis. While much has been written on this issue, little is known about the consequences of housing market discrimination and job decentralization on the economic status of inner-city residents. There exists conflicting evidence concerning the validity of this hypothesis. In addition, studies employ a variety of techniques to study this topic, and making direct comparisons among the papers is often difficult. A brief section first reports some background information on poverty in metropolitan areas. A second section presents the original analysis by John Kain. This study had several pitfalls which caused some researchers to suspect his results. This suspicion stimulated an immediate response from several authors, who produced results that cast skepticism of the validity of this hypothesis. The results of these studies are reported in the third section. Little work was done on this subject again until the 1980s, when the problems of

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[5]John Yinger, "Measuring Discrimination with Fair Housing Audits: Caught in the Act," *American Economic Review* 76 (1986):881-93.

[6]Paul Courant and John Yinger, "On Models of Racial Prejudice and Urban Structure, *Journal of Urban Economics* 4 (1977):272-91.

[7]Harry Holzer, "Informal Job Search and Black Youth Unemployment," *American Economic Review* 77 (1987):446-52.

the inner city reached proportions that researchers and policy analysis could no longer ignore. This more recent work is presented in the fourth section of this paper. The last section provides a summary of the points made in this paper and also a research agenda for future work on this subject.

Population, Labor Force, and Income Trends in Metropolitan Areas: 1980 to 1988

Population

During the past decade, the inner city has continued to decline as a formidable economic entity of the metropolitan area. It has become synonymous with crime, drug abuse, poverty, low labor force participation, and high unemployment. These characteristics in turn lead to further deterioration of the inner city as a viable location for economic opportunities for both firms and residents. This section highlights some of the trends occurring in the inner city during the 1980s.

Table 1 outlines the demographic characteristics in 1980 and 1988 of central cities compared to the demographic characteristics of the suburbs in four regions: Northeast, North Central, South, and West. For all regions in 1980 and 1988, the percentage of white married families living in the suburbs was almost twice as high as the figure in central cities. Over the eight year time period, the percent of white married families in the suburbs had grown in all regions, although this is not the case in the central city where the share of married families living in the central cities declined in every region except the West.

There was a higher concentration of white female-headed families in the central city relative to the suburbs only for the Northeastern and Southern regions in 1980. But by 1988 the percentage of white female-headed families living in the central city declined in every region except the West.

TABLE 1

DEMOGRAPHIC COMPOSITION OF RESIDENTS BY REGION, RACE, AND FAMILY TYPE: 1980 AND 1988
(percent)

	Northeast		North Central		South		West	
	1980	1988	1980	1988	1980	1988	1980	1988
Whites								
Married Families								
Central City	21.0	17.3	15.1	12.1	17.7	16.8	16.5	23.6
Suburbs	40.0	43.1	33.6	35.8	26.3	30.0	24.2	33.7
Female-headed Families								
Central City	37.8	34.7	25.2	23.3	24.7	20.7	22.6	31.2
Suburbs	29.7	33.0	32.5	33.0	23.6	26.3	27.1	32.3
Blacks								
Married Families								
Central City	70.7	61.6	70.2	38.3	37.6	29.3	40.8	44.7
Suburbs	22.6	23.0	17.8	8.7	15.5	13.5	25.0	44.7
Female-headed Families								
Central City	80.4	76.4	77.0	84.6	48.2	41.1	55.5	53.4
Suburbs	15.9	13.5	16.2	7.7	10.5	13.3	24.0	41.0

Notes: The figures are calculated as a percent of all observations in the subgroup. For example, in the Northeast 21 percent of all white married families lived in the central city and 40 percent lived in the suburbs in 1980. The remaining 39 percent did not live in a statistical metropolitan area and/or lived in a rural area.

SOURCE: Computed by author from the 1980 and 1988 Current Population Survey tapes.

Table 1 shows that black married families were significantly concentrated in the central city relative to the suburbs for 1980 and 1988 in all regions except the West where black married families were evenly divided between city and suburbs in 1988. Between 1980 and 1988 the percent of black married families in the central city declined for the Northeastern, North Central, and Southern regions. But this percentage rose in the West. The percent of married black families living in the suburbs increased between 1980 and 1988 in the Northeast and West, but declined in both the North Central and South.

The residence gap between the central city and the suburbs was greatest in the case of black female-headed families, and the gap has not lessened significantly during the 1980 to 1988 period. Moreover, in the North Central region, black female-headed families became more concentrated in the central city between 1980 and 1988.

Labor Force

According to figures in Table 2, heads of white married families in the central city experienced slightly lower rates of employment, higher rates of unemployment, and lower rates of labor force participation than their suburban counterparts. Over this time period, employment, unemployment, and labor force participation fell for this group regardless of their residential location. Spouses for these family heads followed a similar pattern across residential locations but their employment rates increased over time. While unemployment fell between 1980 and 1988 for central city and suburban spouses, both employment and labor force participation rose in each residential location. Moreover, white female-headed families experienced trends similar to those for heads of white married families, though over time labor force participation remained fairly constant for both those in the central city and in the suburbs.

Black families followed the same general trends as white families but these trends were generally less pronounced for each category. For instance, in the case of blacks, unemployment

TABLE 2

LABOR FORCE STATUS BY RACE, LOCATION, AND FAMILY TYPE: 1980 AND 1988
(percent)

	Employed		Unemployed		Not in Labor Force	
	1980	1988	1980	1988	1980	1988
Whites						
Married Family Heads						
Central City	75.9	73.7	3.2	2.7	20.3	23.6
Suburbs	81.0	77.6	2.8	2.0	16.2	20.4
Spouses						
Central City	46.0	54.2	2.7	2.3	51.4	43.5
Suburbs	48.7	56.3	2.2	1.8	49.1	41.9
Female-headed Families						
Central City	51.3	53.2	4.2	2.3	44.6	44.5
Suburbs	62.2	65.4	4.2	2.6	33.6	32.1
Blacks						
Married Family Heads						
Central City	68.8	68.5	4.7	4.7	26.5	26.9
Suburbs	79.0	77.7	4.6	3.6	16.3	18.6
Spouses						
Central City	54.7	62.4	4.8	4.0	40.5	33.4
Suburbs	62.5	68.0	5.0	5.1	32.5	27.0
Female-headed Families						
Central City	47.2	49.2	8.0	7.8	44.8	43.0
Suburbs	56.3	61.3	6.0	6.0	37.6	32.7

Notes: The figures are calculated as a percent of all observations in the subgroup. For example, 75.9 percent of all white married family heads living in the central city and 68.8 percent of all black married family heads living in the central city were classified as employed in 1980.

SOURCE: Computed by author from the 1980 and 1988 Current Population Survey Tapes.

was higher than for whites across both locations and all family types. Employment was higher for white married and female-headed family heads than for black married and black female-headed family heads, although the opposite case existed in the case of black spouses. This may be a result of the lower earnings obtained by black males which increases the necessity of a two earner family. Labor force participation was higher among white family heads relative to black family heads, but was lower among white spouses relative to black spouses. Labor force participation of white female-headed families was about equal to that of black female-headed families.

Heads of black married families living in the central city experienced lower rates of employment, slightly higher rates of unemployment, and lower labor force participation than heads of black married families living in the suburbs. Furthermore, this gap remained fairly constant between 1980 and 1988. A similar trend held for black spouses and female-headed families.

Income

Table 3 illustrates an increase in the percentage of families in poverty for white married families and white female-headed families in both locations during the 1979 to 1987 period. This was also true for black female-headed families both in the suburbs and in the central city, as well as for black married families in the suburbs. The only group to experience a decline in poverty was black married families in the central city. This may be due to a self selection process such that only the more financially secure individuals entered into marriages. Black female-headed families in the suburbs experienced the largest growth in poverty, indicating either that during the 1980s black female-headed families migrated to the suburbs or that poverty encroached among black female-headed families living in the suburbs. Table 3 also shows that there exists

TABLE 3

PERCENT OF FAMILIES WITH INCOME BELOW THE POVERTY LEVEL: 1979 AND 1987
(percent)

	1979	1987
Whites		
Married Families		
Central City	4.9	6.9
Suburbs	3.0	3.6
Female-headed Families		
Central City	30.5	33.0
Suburbs	17.6	19.7
Blacks		
Married Families		
Central City	11.0	9.9
Suburbs	7.9	8.5
Female-headed Families		
Central City	47.8	49.7
Suburbs	38.0	44.0

Notes: The figures are calculated as a percent of all observations in the subgroup. For example, in 1979 4.9 percent of all white married families living in the central city had incomes below the poverty level.

SOURCE: Computed by author from the 1980 and 1988 Current Population Survey Tapes.

a wider gap between the poverty status of black married families and black female-headed families than exists between their white counterparts.

Spatial Mismatch Hypothesis: First Generation Research

Supporting Evidence

This idea was first tested by John Kain.[8] In his paper, Kain tried to determine the extent of the spatial mismatch in the Detroit and Chicago metropolitan areas. His thesis consisted of three hypotheses which were: (1) that the discrimination in the suburban housing market affected the distribution of minority employment, (2) that it restricted the number of jobs available to nonwhite residents, and (3) that the above effects were intensified by the increased suburbanization of the manufacturing industries. To test these hypothesizes, Kain used data from Area Traffic studies for 1952 and 1956, respectively. Both cities were highly segregated, though Chicago slightly more so than Detroit. In Detroit, 93 percent of the nonwhite population lived in the city's principal ghetto, while in Chicago, 96 percent of the nonwhite population lived in the infamous South side ghetto.[9,10]

Kain cited three reasons why the distribution of employment may be sensitive to the residential location of workers. First, higher commuting costs may serve to lower the net wage

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[8]John F. Kain, "Housing Segregation, Negro Employment, and Metropolitan Decentralization," *Quarterly Journal of Economics* 82 (1968):175-197.

[9]Ibid.

[10]These measures of segregation were obtained using the Taebers' segregation index which is defined as the minimum percentage of nonwhites who would have to change the block on which they lived in order to produce an unsegregated distribution. For alternative measures of segregation and decentralization used in the literature and the problems associated with each, see George C. Galster, "On the Measurement of Metropolitan Decentralization of Blacks and Whites," *Urban Studies* 21 (1984):465-470.

for workers, making suburban jobs less attractive to central city residents. Second, greater distances between job sites and residences might lower the probability that information concerning the job will reach potential workers. Thirdly, employers located outside the black residential area may discriminate against blacks. On the other hand, employers located in the black residential areas may discriminate in favor of blacks.[11]

To test the three hypothesizes, Kain specified a simple model, regressing the percent of black employment in a zone against the percent of black residents in the zone, distance of the zone from the nearest ghetto, and the distance of the zone from the major ghetto.[12] His results revealed a positive relationship between residential location and employment site. For example, the data showed that the percentage of black employment in a work zone fell by 0.8 percent with each mile from the major ghetto in Detroit, whereas it fell by 0.4 percent per mile in Chicago. While the size of the coefficients varied according to occupation and industry, this relationship was found to be significant in all cases.

This study also found that the racial composition of a zone greatly influenced the employment practices of firms in that zone. His analysis showed that for Chicago a 2 percent increase in black residents in a zone corresponded to a 1 percent increase in black employment

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[11]This topic is explored by Paul Offner and Daniel H. Saks, "A Note on John Kain's 'Housing Segregation, Negro Employment, and Metropolitan Decentralization'," *Quarterly Journal of Economics* 85 (1971):147-160.

[12]The variable used to measure the effect of the racial composition of the neighborhood on the hiring practices of firms in that zone was defined as the "resident ratio". While this variable should be constructed as the percentage of black residents residing in a given zone, it was instead constructed as the percentage of black workers residing in a given zone due to the limitations of available data. As the author notes, this specification of the model may be capturing the affects of employment on residential locations instead of the reverse.

within that zone. Whereas, a 10 percent increase in black residents in a Detroit zone corresponded to a 1 percent increase in black employment within that zone.[13]

To test his second hypothesis, the effect of suburban housing market discrimination on the absolute number of jobs in the economy, the author predicted the employment level which would result in the absence of any racial discrimination and compared this estimate to the actual employment level. Kain estimated that the absence of segregation in Chicago would lead to between 22,000 and 24,000 more employed black residents. In Detroit, on the other hand, due possibly to its lower degree of segregation blacks would gain only between 3,800 to 9,000 more jobs in the absence of segregation. In addition, Kain tested this relationship among industries and occupations, finding the affects were larger across occupations as opposed to industries. In the case of occupations, both the racial composition variable and the distance variable behaved as expected. Distance was a significant determinant in the case of operatives and service occupations. In the case of industries, all the variables had the expected sign and were significant, but the magnitude of the affect was quite small. Distance from the major ghetto was an important factor for employment in the personal service and repair industry as well as manufacturing and public administration but the effect was smaller than for occupations.

In considering his third hypothesis, Kain used 1950 and 1960 Census information to determine the absolute and relative changes which occurred in the manufacturing industry and its possible affect on the level of nonwhite employment. While the data indicated that there was very little change in the absolute number of manufacturing jobs available between 1954 and 1963

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[13]Kain attributes the different effects to the differences in the degree of segregation occurring in the two cities. For a more thorough discussion of the impact of racial composition on the hiring practices of firms see John McDonald who confirms the results of Kain regarding this effect. John F. McDonald. "The Direct and Indirect Effects of Housing Segregation on Employment Opportunities for Blacks," *Annuals of Regional Science* 15 (1981):27-38.

for the metropolitan area as a whole, the central city lost over 5,500 manufacturing jobs during this time.[14] Moreover, the suburbs gained 1,600 jobs in the service sector compared to 1,300 new service jobs in the central city.[15] As Kain noted, there was one possible offsetting trend. The movement of whites to the suburbs reduced the labor supply in the inner city which increased job opportunities for blacks at that location.[16] Based on these results Kain advocated the decentralization of the ghetto in the belief that the relocation of blacks to locations closer to the suburban labor market would substantially improve their socioeconomic situation.

A commonly proposed alternative to ghetto desegregation is reverse commuting by public or private means. In practice, though, this alternative is not usually a successful one. The probability of low-income central city residents owning an automobile or having access to a personal means of transportation is very low.[17] Furthermore, reliance on public transportation is often not a feasible solution. Because most transportation systems are designed with the suburban commuter in mind, their presence may not significantly alter the employment opportunities of the central city worker. These transportation systems are designed to stop at only a few "collection" points in the suburbs. While these points tend to be close to suburban residential locations they are not necessarily close to suburban employment locations. Since public transportation systems do not adequately serve the central city residents, several cities have separate transportation systems designed solely for use by the central city resident/suburban

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[14]For a detailed discussion of the transformation of employment in metropolitan areas during the past several decades, see Kain, *The Metropolitan Enigma*, p. 89.

[15]Ibid., p. 89.

[16]Gary Becker argues that the relative increase in minority residents may serve to lower the wage offered to these residents. For further discussion see Gary Becker, *The Economics of Discrimination* (Chicago: University of Chicago press, 1971), p. 24.

[17]John D. Kasarda, "Urban Change and Minority Opportunities," in *The New Urban Reality*, edited by Paul Peterson (Washington: The Brookings Institute, 1985), p. 56.

worker.[18] It is not known at the present time how successful these programs have been in solving the mismatch problem. Furthermore, there are additional problems encountered such as discriminatory hiring practices, and poor information about employment opportunities in the suburbs.[19] While transportation systems can alleviate the former hurdle, they may not be very effective on the latter.

Since Kain's original article, several researchers have identified weaknesses with his study. For instance, the primary regression equation determining the level of black employment in a work zone, does not specifically test for the effect of the SMSA's unemployment rate. Due to the design of his study, Kain was unable to test the influence of the unemployment variable. Its effect was captured in the intercept along with all other factors affecting employment that was specific to the Chicago labor market. Due though to the stimulating nature of this hypothesis and the importance of policies stemming from its study, many researchers have continued to unravel and develop our understanding of this problem. Early critiques of Kain's work were offered by Mooney, Masters, Offner and Saks, and Harrison.[20] Together these papers comprise the early opposition to Kain's proposed solution of ghetto decentralization. Table 4 summarizes the data sources, variables tested and results of these studies. While the first three authors offered alternative models to Kain's, Harrison challenged Kain's entire hypothesis on the grounds that

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[18]"City's Jobless Joined to Suburban Jobs," *New York Times*, p. A16, Col. 1 (October 25, 1989).

[19]Ibid.

[20]See Joseph D. Mooney, "Housing Segregation, Negro Employment and Metropolitan Decentralization: An Alternative Perspective," *Quarterly Journal of Economics* 88 (1969):299-311; Stanley H. Masters, "A Note on John Kain's 'Housing Segregation, Negro Employment, and Metropolitan Decentralization'," *Quarterly Journal of Economics* 88 (1974):505-512; Offner and Saks, "A Note on John Kain's 'Housing Segregation, Negro Employment and Metropolitan Decentralization'"; and Bennett Harrison, "The Intrametropolitan Distribution of Minority Economic Welfare," *Journal of Regional Science* 12 (1972):23-43.

TABLE 4

INITIAL STUDIES OF THE SPATIAL MISMATCH HYPOTHESIS

Author(s)	Data Source	Dependent Variable	Selected Independent Variables	Results
Kain, 1968	Detroit Area Traffic Study for 1952 and the Chicago Area Traffic Study for 1956. This data divides the cities into 98 workplace zones. Includes both males and females. Uses aggregate data.	The percentage of black employment in each zone.	Distance from major ghetto: distance from nearest ghetto: resident ratio = (black workers living in zone i)/ (total workers living in i).	Finds a significantly negative relationship between distance and employment. Finds a positive relationship between racial composition of zones and amount of racial employment in the zone.
Mooney, 1969	1960 Census of Population-Journey to Work File; Census of Business and Census of Manufacturing for 1948, 1945, 1958, and 1963. Cross-sectional analysis of 25 SMSAs. Fits males separately from females using aggregate data.	Employment/population ratio of nonwhite men and women living in the low income census tracts.	*SMSA unemployment rate; ratio of central city employment to total SMSA employment in wholesale trade, manufacturing, and services; proportion of nonwhite males (females) who live in the central city and work in the suburbs.	Findings confirmed Kain's result concerning distance and employment, but showed that the unemployment rate had a much more substantial effect on employment. Accessibility was found to be much less important for women.
Offner and Saks, 1971	Used Kain's personal data set.	Ran same model as Kain.	The only change from Kain's model was to square the resident ratio variable.	The squared form performed much better than the linear form but the values of the coefficients were smaller than with the linear form.
Masters, 1974	1960 Census of Population. Cross-sectional analysis of 65 SMSAs using aggregate data. The data set includes only males.	Ratio of median incomes for white and nonwhite males.	An index of segregation: ratio of median years of schooling of nonwhite to white males; dummy variable to denote Southern cities.	None of the four different measures of segregation used was significant and only one was negative; both education and Southern location were of the expected sign and significant in all four cases.
Harrison, 1972	1966 *Survey of Economic Opportunity*. Sample includes males living in families in cities across the U.S. Micro data set.	Measures the spatial variations in earnings, unemployment and occupational status in terms of frequency distributions only; no regression analysis used on these explanatory variables.	Not applicable.	Results show that earnings for whites are more sensitive to spatial location than are those for blacks. Blacks are shown to earn the same regardless of location. For both blacks and whites, unemployment is highest in the central city, though it is everywhere lower for whites. In terms of occupational status, blacks are concentrated in low ranking occupations in all parts of the urban area relative to whites.

the true culprit of the economic disparity was race, not residential location. In fact, Harrison advocates ghetto development and not decentralization. To outline the literature containing the counter argument to Kain, we will begin with the alternative models that were proposed and conclude with the study by Bennett Harrison, which seems to have gained the most exposure in the subsequent literature.

Revisions and Reformulations

In a cross sectional study of the 25 largest SMSAs in 1960, Mooney added the metropolitan unemployment rate to Kain's original model. His results confirmed Kain's negative relationship between accessibility to the suburbs and the employment rate in the central city. But the results also revealed that the unemployment rate had a larger impact than accessibility on the employment rate of the central city residents. This finding suggests that in a full employment economy, ghetto decentralization is advantageous, but in the presence of a slack labor force, efforts to boost employment of blacks would be most efficiently spent on macro policies designed to stimulate the economy.

In addition to including the unemployment rate, Mooney separated the data on the basis of gender and tested the spatial isolation affect on employment in different types of industries, specifically services and manufacturing. To the extent that females were concentrated in the service industries that were primarily located in the central city, the migration of manufacturing firms to the suburbs would not affect female employment. The results indicated that accessibility to the suburban labor market was less important in the case of female employment in the service sector compared to male employment in the service sector, but accessibility was as important for female employment as it was for male employment when total employment is not disaggregated by industry. The results for males indicated that accessibility was important in the case of manufacturing employment as well as total employment. This finding prompted Mooney to

consider central city residence an asset for females but a hindrance for males. From these findings it is no longer clear that the ghetto dispersion advocated by Kain is the most appropriate solution to the problem, since central city location may be beneficial to low skilled females, although not for males. However, while the effect of accessibility was found to vary by industrial sector, the size of the coefficient paled in comparison to the affect of the SMSA unemployment rate on all persons in all industries.

Offner and Saks, using Kain's original data, demonstrated the lack of robustness of Kain's results. Embedded in the original argument of Kain's was the proposition that the higher the proportion of blacks residing in an employment area, the higher would be the level of black employment in that area. The Offner-Saks premise suggests that the racial backgrounds of the residents has a nonlinear impact on the employment within that area. To test their hypothesis the authors inserted the squared form of Kain's "resident ratio" variable. The authors found that their nonlinear variable performed better than the linear version used by Kain, leading Offner and Saks to argue against ghetto desegregation on the basis that a reduction in racial segregation would disproportionately eliminate black employment opportunities.[21]

A third alternative specification of Kain's original model, proposed by Masters, tested the effect of racial segregation on the ratio of median incomes of nonwhite and white males in 65 of the largest SMSA in 1960. The use of income as a dependent variable provided information on the relative quality of employment as opposed to the sheer number of jobs. In the presence of a dual labor market, income or earnings would be the more useful variable.[22] Masters tested

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[21]This same policy conclusion is advocated by H. C. Goddard. See Haynes C. Goddard, "Recent Evidence on Black Employment and Metropolitan Decentralization," *Growth and Change* 13 (1982):32-39.

[22]The hypothesis of the dual labor market states that there is in effect a two tier labor market. On the top tier are the high income, high opportunity jobs. On the bottom tier are the low

four different measures of segregation. In no case was the degree of segregation significantly related to the ratio of median incomes.[23]

Harrison, recognizing the limitations of measuring the cost of spatial disassociation with the suburban labor market solely in terms of employment opportunities, considered five measures of welfare: earnings, unemployment, occupational status, returns to education, and returns to training programs in the first published study on this topic using a micro data set.[24] The study consisted of computing the frequency distributions of earnings, unemployment, and occupational status within the three sections of the urban area, central city poverty tracts, central city nonpoverty tracts, and the suburbs. In addition, the author estimated the returns to education and training programs using each of the above mentioned measures of welfare as dependent variables.[25]

The study revealed that the well-being of whites when measured against earnings, unemployment, or occupational status was influenced to a much greater extent by residential

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paying, "dead-end" jobs. Proponents of this hypothesis argue that women and blacks are continually concentrated in these lower tier jobs. For a more detailed discussion of the theory of the dual labor market see William T. Dickens and Kevin Lang, A Test of Dual Labor Market Theory," *American Economic Review* 75 (1985):792-805.

[23]Galster, using a simultaneous system to study the interdependencies of segregation and economic disparity on black-white median income ratios, found that increased segregation had a negative effect on the occupational mobility of minority residents. See George C. Galster, "Residential Segregation and Interracial Economic Disparities: A Simultaneous Approach," *Journal of Urban Economics* 21 (1987):22-44.

[24]The occupational rankings are determined by the Duncan-NORC prestige scores which assigns a number 1-100 to each of the 308 Census occupations included in the survey. See Harrison, "The Intrametropolitan Distribution of Minority Economic Welfare."

[25]The data set used in the study was the 1966 *Survey of Economic Opportunity*, conducted by the Census Bureau as a supplement to the *Current Population Survey*. This data set contained information on 11,454 adult males who were not in school and were part of the labor force. Although this was a national sample, the author used data on individuals from only 12 cities. These 12 cities contained 66 percent of the entire black population living outside the South during that time.

location than that of blacks. According to his findings, white suburban residents experienced higher earnings, lower unemployment, and greater occupational status. For whites, earnings and occupational status were found to be positively related to distance from the city center, while unemployment was found to be negatively related to distance from the city center.

For blacks, Harrison found that earnings were highest in the nonpoverty census tracts of the central city contradicting the popular notion that the suburban labor market was the location with the greatest gains. Earnings were equal throughout the urban area and had a modal value equivalent to that obtained for whites in the central city. Furthermore, Harrison found that unemployment was somewhat lower and less permanent in the suburbs but it was higher for blacks than for whites in all census tracts in the metropolitan area. The data also revealed that blacks obtained somewhat higher occupational status in the nonpoverty central city census tracts relative to the suburbs but blacks were concentrated in low ranking occupations in all parts of the metropolis.

To test the returns to education and training program participation, the author regressed earnings, employment, and occupational status against levels of educational attainment and training program completion and participation. Rewards for additional educational attainment or training program participation occurred in discrete steps for both blacks and whites but at different time periods based upon race. Whites experienced an initial pecuniary reward after eight or nine years of schooling depending on their employment location (i.e., central city poverty tracts, central city nonpoverty tracts, or the suburbs) and experienced substantial pecuniary gains after high school and college relative to blacks. Blacks, on the other hand, experienced the initial payoff after 12 or 13 years of education, again depending on their employment location. Continued education for blacks was found to be beneficial only in terms of higher earnings if the

individual completed college and in that case potential earnings did not to vary with respect to location within the urban area.

A striking finding was that education was estimated to have a relatively small effect on the stability of employment for blacks as well as for whites. In fact, marginal gains in education actually reduced the employment rate for black males in the nonpoverty tracts of the city and was found to have absolutely no effect on the employment rate of blacks in the suburbs.

In terms of increasing occupational status, education was estimated to be effective in increasing the occupational mobility of whites and was found to be more effective in the suburbs than in the central city. This was not true for blacks. The results showed that blacks were unable to convert higher educational attainment into higher occupational status which would lead to higher earnings and lower unemployment. These negative results suggest some reason behind the high rate of high school dropouts associated with young blacks.

From these findings Harrison concluded that the economic conditions suffered by blacks is not a result of their inner-city residence but that of discrimination which was according to his findings equally pervasive throughout the urban area. Indeed, this author initiated the "race not space" school of thought.[26] A major weakness of this study must be noted. The data used by this author contain no information on the employment locations of the individuals included in the sample. Therefore, all results and conclusions were drawn on the basis of residential location. To the extent that individuals commute to their jobs, the results will be muddled. For instance, suburbanites are known to commute to central city jobs. The results may represent the distribution of income and jobs within an urban area rather than evidence against the hypothesis

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[26]See also David Ellwood, "The Spatial Mismatch Hypothesis," in *The Black Youth Employment Crisis*, edited by R. Freeman and H. Holzer (Chicago: University of Chicago Press, 1986), pp. 147-185.

that spatial mismatch does not contribute to unemployment. But the argument that racial discrimination in employment contributes more than spatial mismatch to limited employment opportunities is difficult to refute.

Conclusions from the Early Literature

While the initial work on this topic has been successful in defining the issue and bringing it to the attention of those in the field, it has been unsuccessful in providing any conclusive evidence, either way, as to the employment cost of inner-city residence. For the most part, other researchers argue that Kain's positive confirmation of the spatial mismatch hypothesis should be largely disregarded due to the misspecification of the model. As Mooney illustrated when more SMSA's are examined and the unemployment rate is included in the model, the spatial mismatch hypothesis is verified, but is also shown to be quite small as a determinant of the employment opportunities of inner-city residents when compared to the effect of the SMSA's unemployment rate. While the results from this paper offer positive support for the mismatch hypothesis, they contain drastically different policy implications from those proposed by Kain. In addition, Offner and Saks show how sensitive Kain's results are to the functional form used in the model. Furthermore, Masters finds no relationship between the level of segregation and the ratio of incomes between races. On the other hand, Harrison's study can be said to provide as little support to the contrary as Kain's study did to the confirmation of this hypothesis. Harrison's study, however, does not illuminate the causes of central city/suburban income differentials but can state the magnitude to which differences across locations exist. Thus, from this literature there is still little we can confidently say about the relationship between the welfare of inner-city residents and their ability to gain access to the suburban labor market. While it sounds plausible that housing market discrimination will have an affect on the well-being of inner-city residents

especially in light of the sectoral changes that have been occurring in the economy, this has yet to be verified empirically.

This literature has perhaps raised more questions about this topic than it has answered. The papers presented above illustrate the normative nature with which this topic had been initially discussed. The focus on the effects of segregation and spatial inaccessibility on inner-city residents alone verifies this proposition. This early literature is primarily concerned with "tagging" or reserving jobs for central city residents. Regardless of the final conclusions of the literature, a study of this topic ought to take into account the affect on earnings and employment of all individuals in the urban area, those in the inner city as well as in the suburbs. For example, are the earnings of all individuals reduced due to what seems to be an inefficient arrangement of people and employment? Under this situation what is the efficient arrangement of people and jobs? A policy which improves the welfare of the inner-city resident at the expense of the suburban resident does not necessarily imply an improvement in social welfare. For instance, is it more efficient to have the suburban people holding the so called high-wage jobs and have the government institute a system of transfers to the inner-city residents or are there long-run gains from establishing an attachment to the labor force? If so, which of these effects is more important. The analysis of these types of questions calls for a general equilibrium framework so as to assess the affect of housing market discrimination on all residents in the urban area as opposed to the partial equilibrium analysis which has been undertaken thus far.

A second shortcoming of this early literature is the implicit assumption that firms, specifically manufacturing, have moved to the suburbs due to a greater demand for land and not due to a change in labor demand. Suppose, however, manufacturing firms have undergone technological change which increases their demand for highly skilled labor as well as for more land. To meet both the demand for space, required by the new technology, and the demand for

more highly skilled labor, firms migrated to the suburbs. If this is in fact the cause of the migration, then the growth in the central city unemployment stems not from an accessibility problem but from a declining demand for low skilled labor. It also implies that the returns to employment which are thought to exist in the suburbs are a reflection of a higher productivity on the part of the suburban worker and may not be available from a low-skilled inner-city worker, regardless of an accessibility problem.

The technological changes in transportation and production methods are well documented as is their influence on the locational decisions of firms.[27] In conjunction with the migration of manufacturing firms from the central city, Kasarda points out that between 1970 and 1980 a growing number of what he refers to as "information-processing" jobs were opening up in the central city.[28] While there is sketchy information on the change in labor demands for the manufacturing firms, the educational attainment required for employment in the central city was increasing, further damaging unemployment opportunities for central city residents. This is surely an area ripe for study.

A related issue is whether firms that are presently migrating or deciding on a suburban versus central city location are doing so according to the same set of determinants as earlier firms. That is, are new firms locating in the suburbs doing so because of increases in the demand for land and a higher quality labor force, or are they fleeing from the high rate of crime and taxes found in the city relative to the suburbs? The data on investment in plant and

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[27]For some historical background on the migration of firms and people to the suburbs see Kain, "The Distribution and Movement of Jobs and Industry," pp. 73-114. See also Kasarda, "Urban Change and Minority Opportunities."

[28]Kasarda defines entry level jobs as those jobs for which the average employee's educational attainment is less than a high school degree and information processing jobs as those for which the average employee's educational attainment is at least two years of college.

equipment seems to indicate that the original migration from the central city took place as a result of changes in technology.[29] But this may not be true for present investment in plant and equipment. Although some work has been done in this area, empirical evidence on the factors determining intraurban location is still inconclusive.

The initial perception obtained from these four papers is simplistic. But as must now be realized the issue is very complex, indeed. The papers presented below attempt to incorporate more of the complexity into their studies to the extent it is manageable. Unfortunately, while they shed some light on the topic, the results as to the effect of the spatial mismatch hypothesis are still undergoing debate.

Second Generation Literature

While the original debate focused on the effects of housing market discrimination and the migration of low-skilled jobs to the suburbs on the well-being of inner-city residents, the recent literature is much broader in focus. As with the early work these papers are concerned with ascertaining the cost of housing market discrimination. As opposed to focusing only on the effects on employment, these later papers also attempt to ascertain the effects of residential location as measured by earnings and labor force participation.

An additional contribution of the recent literature is the use of micro data. All but one of the papers reviewed below employs micro data. Results derived from micro data sets are far more satisfying than those derived from aggregate data. Although, there are several micro data sets available, not all are acceptable for use in analyzing this subject. When considering the effect on earnings the data set should contain both the worker's place of residence and place of

[29]Kain, "The Distribution and Movement of Jobs and Industry."

work. Many data sets such as the *Current Population Survey* and the *Panel Survey of Income Dynamics* contain only locational information on the residence and thus are not detailed enough to examine the effect of job decentralization on earnings, but would be appropriate in the case of unemployment or labor force participation. A good source for information on earnings is the decennial census public use sample, which contains the worker's place of residence, work site county, and travel time and mode to work.[30]

The remainder of this section is devoted to the presentation of the results from these studies. The papers are divided into three groups based on the unit of analysis, earnings, employment, or labor force participation. See Tables 5, 6, and 7, respectively, for a summary of data sources, testable hypothesizes, models, and results for each of the studies reviewed.

Earnings

Labor earnings capture more of the effects of the differences between the residence and employment sites than do employment or labor force participation variables. For instance, a possible outcome of the spatial mismatch hypothesis may be that inner-city residents are forced to take jobs in the suburbs but are not compensated for commuting costs. Although the number of jobs may remain constant, the lower real earnings should be considered a consequence of the spatial mismatch hypothesis. Moreover, it is earnings in which we are ultimately concerned. If the spatial pattern of employment results in lower wages for inner-city residents then although they have jobs, they are still harmed by the existing spatial arrangement. This implies that there exist gains to welfare from a rearrangement of residents.

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[30]An additional source of information which would be particularly useful when considering the effects on labor force participation would be the *National Longitudinal Survey* from Ohio State University.

TABLE 5

SUBSEQUENT STUDIES CONSIDERING THE EFFECTS ON EARNINGS

Author(s)	Data Source	Testable Hypothesis	Selected Independent Variables	Results
Price and Mills, 1985	Census of Population Survey for 1978 plus an index of locational amenities for various metropolitan areas. The sample is restricted to fully employed males between 25 and 59 years old.	Proposes three alternative models of the effect of race and residence on earnings. 1. Race and residence do not affect the marginal evaluation but do affect the base level of earnings. 2. Race and residence affect the marginal evaluation and the base level of earnings. 3. Race may affect the marginal evaluation but accessibility may affect the base level of earnings.	Work experience, education, several occupational categories, SMSA population, dummies for race and residence, and the SMSA unemployment rate. Model 2 includes the same variables as Model 1, but the data are grouped by race/residential categories, so that each group may have its own intercept. Model 3 includes the same variables as Model 1, but the data are grouped by race only so that each group may have its own intercept.	The estimates of Model 1 state that blacks receive 15.6 percent lower earnings due to their race and 6 percent lower earnings due to their residential location compared to a white employee. Under Model 2, blacks receive 25.6 percent lower earnings relative to a white suburban resident due [illegible] race and 8.6 percent lower earnings due to their residential location. Under Model 3, blacks face a racial penalty of 15.2 percent and a central city penalty of 5.7 percent. The results from all models imply that race has a much larger impact on earnings than residence.
Danziger and Weinstein, 1976	1970 Census of Employment Survey micro level data on poverty area residents. Includes only males between 21 and 64 residing in St. Louis, Cleveland, and Detroit.	Tests the extent to which suburban jobs held by central city residents are financially superior to jobs located in the central city and held by central city residents.	A wage differential is computed between the individual's actual suburban wage and the wage this individual would have earned in the central city poverty tracts. The variables included in the wage equation are: age, race, sex, educational attainment, occupational and industrial status. In addition to running this model on the full sample, the data are grouped into white, blue, or operative workers.	Results for individuals working and residing in the poverty tracts show that race had a negative but insignificant effect on wage levels. Education was found to have an insignificant effect on the wages of individuals working and residing in the poverty tracts. Results of the wage differentials indicate no systematic difference between wages of suburban workers and wages of poverty tract workers.

TABLE 5

SUBSEQUENT STUDIES CONSIDERING THE EFFECTS ON EARNINGS

Author(s)	Data Source	Testable Hypothesis	Selected Independent Variables	Results
Ihlanfeldt and Sjoquist, 1989	Panel Survey of Income Dynamics, 1978 and 1980 Census of Population. Sample restricted to labor force participants and those individuals classified as temporarily laid off, desirous of work or unemployed and have no more than a high school diploma who reside in the central city. The analysis includes cross sectional data on 121 SMSAs and 136 central cities.	Tests the effect of employment decentralization on the earnings of central city black and white low-skilled residents.	Variables include various human capital variables, the extent of job decentralization, and several metropolitan area characteristics. Measures of job decentralization include the fraction of the urban area's low-skilled jobs located outside the central city.	The results show that both black and white low-skilled workers' wages were lower due to the decentralization of employment. White females also face lower wages due to decentralization but black females do not suffer significantly. Moreover, there was a significant return to higher education for both races, especially in the case of black males. The unemployment had a negative effect on the earnings of black and white men but a positive effect on black and white women.
Ihlanfeldt, 1988	1980 Public Use Sample for the Atlanta SMSA.	Tests for the determinants of variation in earnings and discrimination.	Earnings equation: includes age, educational attainment, and various other productivity proxies; dummy variables for sex, job location. Discrimination equation: computes mean level of earnings based on the coefficients from the earnings equation and the mean productivity characteristics for black males and females. Calculates the predicted earnings level by evaluating the earnings equation of black males and females at the rate estimated for white males and females. The difference in earnings computed under each regime is attributed to discrimination.	Earnings equation: whites in blue and white collar occupations experience a negative wage gradient. Blacks in blue and white collar jobs experience a positive wage gradient. Service earnings were not found to vary over space for blacks. Service earnings for whites were mixed. Discrimination equation: found greater discrimination between black men and white men than between white and black women. The results also indicate that discrimination decreases with distance from the city center.

TABLE 5

SUBSEQUENT STUDIES CONSIDERING THE EFFECTS ON EARNINGS

Author(s)	Data Source	Testable Hypothesis	Selected Independent Variables	Results
Vrooman and Greenfield, 1980	Survey data from the National Opinion Research Corporation for the Adult Performance Level project at the University of Texas at Austin. Includes persons between 18 and 64 living in central cities.	This paper compares the earnings of central city blacks with blacks living in the suburbs. The paper is based on the hypothesis that segregation in the labor market is spatial coincident with residential segregation.	Using path analysis, this model includes the following variables: educational attainment, vocational training, a proxy for work experience, dummy variable to denote full-or part-time employment.	The results indicate that only a portion of the earnings disparity is a result of spatial location. Overt and institutional discrimination account for the remainder. The findings indicate that black males would benefit from greater access to the suburban labor but that black women would not.
Straszheim, 1980	Micro data from San Francisco and Oakland labor market in 1965.	The paper tests for the variation in wages over the urban area.	The study uses income instead of earnings. The model includes the following variables: age, job type, and work site location.	In the case of whites, evidence of a negative wage gradient was found for the subsample with more than 12 years of education. For whites with less education, the wage gradient is less steep but still negative. Blacks with more than 12 years of education experience a positive wage gradient which becomes steeper as education falls.

TABLE 6

SUBSEQUENT STUDIES CONSIDERING THE EFFECTS ON EMPLOYMENT

Author(s)	Data Source	Testable Hypothesis	Selected Independent Variables	Results
Moore and Laramore, 1990*	1970 and 1980 Census of Population. Sample includes males and females in 98 U.S. cities. The data is stratified by sex. Uses aggregate data.	Estimates the effect on the employment opportunities of [illegible] blacks from the structural changes occurring in the economy. This paper considers the combined effect of a possible [illegible] educational mismatch on employment opportunities.	Share of employment by sector; change in sectoral employment share between 1970 and 1980, age and educational attainment characteristics of the work force; percentage of the work force which is black; percentage change in total employment in all sectors; 1970 unemployment rate.	Lagged dependent variable was positive and significant for all race/sex subsamples, indicating a strong historical trend to unemployment. Employment growth in the manufacturing sector lead to a decrease in the unemployment rate for all race/sex groups, but the effect was much larger for men compared to women. For all race/sex groups except white females, the base level of employment in the producer sector significantly decreased unemployment rates. For white males and females, the percent of the work force with a high school degree and the change in the percent with a high school degree significantly decreased unemployment rates.
Jonathan Leonard, 1987	Longitudinal sample establishment-level data for 1974 and 1980 provided by the Office of Federal Contract Compliance Programs on Equal Opportunity Employment Compliance. The sample includes males in the Chicago and Los Angeles metropolitan area.	Housing market discrimination limits the employment opportunities of inner city residents. It may not necessarily be the case that blacks are restricted from the suburban labor market by discrimination, but rather that they may choose not to work there because the commuting costs are too high.	Using a log-odds specification, the authors estimate the firm's demand curve for black labor. The proportion of black labor is dependent on affirmative action pressure, taste for discrimination, skill requirements, and the wage rate necessary to induce blacks to commute from the ghetto.	The paper found that distance from the ghetto was one of the most significant determinants of the racial composition of the work force. A good transportation system was found to have little effect on overcoming the effect of housing segregation.

*The dependent variable in this paper is really defined as the unemployment rate, instead of the employment rate.

TABLE 7

SUBSEQUENT STUDIES CONSIDERING THE EFFECTS ON LABOR FORCE PARTICIPATION

Author(s)	Data Source	Testable Hypothesis	Selected Independent Variables	Results
Ihlanfeldt and Sjoquist, 1989	1980 Census of Population and Housing, Public Use Sample	Tests the extent to which poor accessibility to jobs results in lower labor force participation among black youth. The model employs a logit estimating technique to account for the simultaneity between the decision to attend school or participate in the labor force. The sample included only those individuals between 16 and 19 who were still living at home.	The model includes the youths' personal characteristics, family characteristics, and location of residence. Separate equations were run for blacks and whites.	The results indicated that job access had a substantial impact on the employment probabilities of youth. The results also indicated that central city residence improved the employment probabilities of black youth but had no effect on the employment of white youth. Black females were found to have significantly lower employment probabilities than white females.
David Ellwood, 1986	1970 Census Employment; 1970 Chicago Area Transportation Study	Tests the extent to which job accessibility affects labor market decisions in the case of youth.	The model includes the percentage of the population which is black; the percentage of the persons in school aged 16 to 21; family income and the percentage of families living below the poverty level. In addition, the model included the following measures of accessibility: the import ratio, the average commuting time, and the number of jobs within a 30 minute commute of the residential area.	No measure of accessibility was found to significantly affect the employment opportunities of either black or white youth. Using a fixed effects model, the results indicate that residential location had no effect on job probabilities of teenagers. Racial differences were much more significant in determining the employment probabilities of teenagers.

There are two basic approaches used in analyzing this the effect on earnings. The first is to consider a wage gradient which determines the relationship between distance from the city center and wage levels which is the method used by Straszheim and Ihlanfeldt.[31] Evidence of a positive wage gradient for low-skilled individuals serves as support for the hypothesis that the suburban labor market offers a higher wage than the central city labor market, although these results should be interpreted with care. For instance, if the earnings data is available only by households and not by employment site, then an earnings gradient captures the spatial distribution of income by residential location and not the variation in wages throughout the urban area. When properly applied, a wage gradient can depict the distribution of wages for a given urban area, but it fails to test the spatial mismatch hypothesis.[32] The sole fact that wages are higher in the suburbs does not constitute a basis for the presence of a spatial mismatch. Verification of the spatial mismatch hypothesis depends on the degree to which inner-city residents are excluded from the suburban labor market. A wage gradient does not include a measure of

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[31]The standard form of a wage gradient is analogous to a density or rent gradient, i.e. $w(k)=w_0e^{-gk}$ where $g=(-w_k/w)$, k denotes distance and w denotes levels of wages. See Richard F. Muth, *Cities and Housing: The Spatial Pattern of Urban Residential Land Use* (Chicago: The University of Chicago Press, 1969), for more detail on this formulation. Using this functional form Straszheim performs simulations to estimate the relationship between distance from the city center and wage levels. Due to extensive data requirements of the wage gradient model, the author estimates a linear regression model for black and white individuals. With knowledge of the location of various suburbs located in the San Francisco and Oakland area he is able to determine the extent to which wages vary with distance. Ihlanfeldt estimates a log-linear equation as well. Based on these results he is able to determine how wages vary with distance in the Atlanta labor market. See Mahlon R. Straszheim, "Discrimination and the Spatial Characteristics of the Urban Labor Market for Black Workers," *Journal of Urban Economics* 7 (1980):119-140; and Keith R. Ihlanfeldt, "Intrametropolitan Variation in Earnings and Labor Market Discrimination: An Econometric Analysis of the Atlanta Labor Market," *Southern Economic Journal* 55 (1988):123-140.

[32]In addition, wages offered at various locations reflect the commuting costs of the workers. Thus suburban firms may benefit from a work force from the suburbs which do not require much compensation for commuting costs. This will tend to smooth out the wage gradient over the metropolitan area.

accessibility of inner-city residents and thus is unable to fully test the for the presence of a spatial mismatch.

The results of Ihlanfeldt's study provide evidence of a negative wage gradient for white workers in blue and white collar occupations and a positive wage gradient for blacks in these same occupations.[33] The Straszheim study finds evidence of a negative wage gradient for whites with more than 12 years education. In the case of blacks, the results indicate a positive wage gradient for blacks with low educational attainment and a slightly negative gradient for blacks with more than 12 years of education.[34]

The second approach focuses on the determinants of the spatial distribution of income within an urban area with special attention given to the role played by residential location and race.[35] The typical method of analysis in this case is to construct a simple regression model in which variables designed to capture the effects on wage levels of residential location, decentralization of employment, and race are included. Results yielding a negative coefficient on residence serve to confirm the spatial mismatch hypothesis, indicating that inner-city residents receive lower wages due to their residential location. Both the wage gradient approach and this approach can be used to provide evidence in the ghetto dispersement debate, but this procedure is ultimately superior to the wage gradient method in that it allows one to entangle the effects

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[33]The author uses the 1980 Public Use Sample for the Atlanta SMSA. This data set gives detailed information on the worker's characteristics as well as the worker's place of residence, work site county, and distance and mode of transportation to work.

[34]The data used in this paper is from a 1965 household survey of the San Francisco metropolitan area. The survey includes the following information on 28,000 individuals: age, sex, race, income, place of work, place of residence, years of schooling, and occupation.

[35]Richard Price and Edwin Mills, "Race and Residence in Earnings Determination," *Journal of Urban Economics* 7 (1985):1-18; and Keith R. Ihlanfeldt and David L. Sjoquist, "The Impact of Job Decentralization on the Economic Welfare of Central City Blacks," *Journal of Urban Economics* 26 (1989):110-130.

of earnings from racial discrimination, residential location, and various individual characteristics. If, for instance, earnings are more sensitive to racial prejudice than to residential location as several authors have found, then even in the presence of a positive wage gradient relocation of blacks to the suburbs would not result in a decline in the black/white income disparity. Because there are other factors influencing wages besides residential location, it is necessary to know not only the relationship between wages and residential location but also between wages and race and various other characteristics such as age and education.

This second approach often involves estimating separate reduced-form earnings equations for central city and suburban residents. Insight into the magnitude of the mismatch is gained by calculating a predicted wage for the suburban resident if he or she worked in the central city labor market and received the same marginal evaluation of characteristics as central city residents.[36] The difference between the predicted wage and the suburban residents' actual wage provides an indication of the variation in market evaluations between the two labor markets.

Price and Mills found that the disparity in income between blacks and whites was a combination of racial factors and residential location.[37] Their study proposed three alternative hypothesizes concerning the relationship between race and residential location on earnings.[38] The study produced three estimates of the effect of race and residence on earnings corresponding

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[36]Vrooman and Greenfield use several variations of this procedure. See John Vrooman and Stuart Greenfield, "Are Blacks Making It in the Suburbs? Some New Evidence on Intrametropolitan Spatial Segmentation," *Journal of Urban Economics* 7 (1980):155-167.

[37]This study uses the May 1978 *Current Population Survey* sample and supplements this with a metropolitan amenities index. See Price and Mills, "Race and Residence in Earnings Determination."

[38]**Hypothesis 1:** Race and residence affect the marginal evaluation of skills in the market place but not the base level of earnings. **Hypothesis 2:** Race and residence affect both the marginal evaluation of skills by the market and the base level of earnings. **Hypothesis 3:** Race affects market evaluations and residence affects earnings.

to three alternative hypothesizes, ranging from 15.2 percent to 25.8 percent lower earnings due to racial discrimination, and from 5.7 percent to 8.6 percent lower earnings due to residential location. Although the results indicate that some of the income disparity can be attributed to a spatial mismatch, racial effects account for a much larger portion of the difference.

Vrooman and Greenfield obtain results similar to Price and Mills.[39] Their results indicate that only part of the income disparity between blacks and whites is due to the residential location of blacks. Racial discrimination in various forms accounts for a much greater portion of the difference.[40] Moreover, their results show that ghetto dispersement will lead to higher earnings in the case of black males but not on the case of black females.[41]

Results from Danziger and Weinstein found no systematic difference in earnings between suburban and poverty tract workers.[42] Their results also indicated that education had no significant influence on earnings of poverty tract individuals. (Furthermore, from the results the hypothesis that race does not matter could not be rejected.)

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[39]This study makes use of a survey conducted by the Opinion Research Corporation at the University of Texas at Austin. The Adult Performance Level survey provides information on functional competency of U.S. adults, as well as information on age, sex, race, years of schooling, earnings, and residential location. See Vrooman and Greenfield, "Are Blacks Making It in the Suburbs?"; and Price and Mills, "Race and Residence in Earnings Determination."

[40]This study considers three different types of discrimination. Spatial discrimination is defined as the difference in earnings which exists due to an individual's residential location. Institutional discrimination defined as the difference in the allocation of human capital between blacks and whites. Overt discrimination defined as the difference in market evaluations between blacks and whites.

[41]This result is disputed by Reid who after reanalyzing the authors's results concludes that both black men and women are disadvantaged by their inner city residence. See Clifford E. Reid, "Are Blacks Making It in the Suburbs? A Correction," *Journal of Urban Economics* 16 (1984):357-359.

[42]The study uses microeconomic data from the 1970 Census of Employment Survey. The universe of this survey is poverty and nonpoverty census tract residents. See Sheldon Danziger and Michael Weinstein, "Employment Location and Wage Rates of Poverty-Area Residents," *Journal of Urban Economics* 3 (1976):127-145.

Ihlanfeldt and Sjoquist found that decentralization significantly affected the earnings of low skilled black and white males residing in the central city.[43,44]

The results indicated that while the earnings of low-skilled white women were also disadvantaged by inner-city residence, the earning levels of low-skilled black women were not. Contrary to the studies presented above, these results confirmed a significant return to education for black and white males.

Although these papers provide mixed results concerning the magnitude of the effect of residence and race on earnings, most found that both of these factors have some influence on earnings. This seems to be especially true for black men, but may not be the case for black women. Furthermore, these papers generally find that race has a larger impact on earnings than residential location. Lastly, the conclusions reached in these papers imply vastly different solutions to the problems of the inner city. For instance, papers finding that residential location is a significant factor in the determination of earnings would favor policies designed to decrease the distance to or increase the accessibility of the suburban labor market for the inner-city resident. On the other hand, papers citing the racial background of the worker as the limiting factor would favor policies designed to decrease the degree of discrimination in the labor market.

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[43]The data source for the worker's characteristics are from the 1978 Panel Survey of Income Dynamics. The data referring to the characteristics of the labor market are from the 1980 Census of Population and Housing. See Ihlanfeldt and Sjoquist, "The Impact of Job Decentralization on the Economic Welfare of Central City Blacks."

[44]The authors estimate a reduced-form equation in which earnings is a function of human capital characteristics, metropolitan area characteristics, and the degree of the individual's job decentralization. Two measures of decentralization are tested. The first is defined as LSKILLJS which is the percentage of low-skilled jobs located in the suburbs. The second is G which is analogous to a density function. It is the log of the fraction of metropolitan low-skilled jobs located in the central city divided by the log of the ratio of the area of the central city to the area of the SMSA.

Employment

There are a few recent papers using employment as the unit of analysis. While this literature fails to account for the quality of employment, it does account for the number of jobs. For instance, even if earnings are higher in the suburbs than in the city center it is not immediately clear that there exists the same number of jobs before the exodus of manufacturing from the inner city as after. If the absolute level of jobs decreased because of the migration of firms from the inner city, then ghetto dispersal would not be a very effective policy regardless of the level of earnings available in the suburbs. Furthermore, employment is an endogenous variable. As will be shown below, the spatial arrangement of industries may also affect the labor force participation of inner-city individuals. If this is so, then the rise in unemployment is only one cost of the spatial mismatch problem.

Moore and Laramore consider the effect of the changing urban employment structure on the unemployment rate of black and white males and females.[45] While it was emphasized above that studies using micro data are preferable to studies using aggregate data, this study using aggregate data makes several significant contributions.[46] The first is the testing of the effect of the structural change in the economy on the employment rate of central city residents. The second is the use of labor force participation as the dependent variable. The paper is initiated from the popular contention that the growth of the service sector and the relative decline of the manufacturing base of the U.S. has adversely affected middle and low income individuals.[47]

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[45]Thomas A. Moore and Aaron Laramore, "Industrial Change and Urban Joblessness: An Assessment of the Mismatch Hypothesis," *Urban Affairs Quarterly* (forthcoming 1990).

[46]The data analyzed in this paper is from the 1970 and 1980 Census of Population and Housing.

[47]This paper estimates the effect of the 1970 base level of employment in four sectors of the economy and the change in this level of employment in these sectors between 1970 and 1980 on

The results reveal that growth in the economy reduced the unemployment rate for blacks, but had no effect on the unemployment rate of nonblacks. Moreover, the growth in the youth cohort had an insignificant effect on the employment of both blacks and nonblacks. With respect to education, increases in the number of high school graduates reduced unemployment among nonblacks, but was found to have no effect on the unemployment of blacks. While the 1970 level of producer services had a negative influence on the unemployment level, all other sectoral variables measuring the change in the employment by sector displayed no systematic trends for the different race/sex groups and provided little support for the spatial mismatch hypothesis.[48]

Leonard, in a study of the Chicago and Los Angeles labor markets, found that residential segregation significantly restricted the degree of racial integration occurring in the labor markets.[49] The purpose of this study was to assess the degree of control firms had over integrating their work force. His hypothesis was that firms located in the suburbs employed persons from a largely white labor pool. In order to induce blacks to seek employment in the suburbs firms had to offer higher gross wages to blacks to compensate them for the commuting costs. Without this financial inducement the firms were unable to attract black workers and were thus less able, regardless of how willing, to achieve racial integration of their work force. His model tested for the affect of distance on the employment share of black and white males with

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the unemployment rates of central cities.

[48]The authors use the Browning and Singelmann industrial classification for sectors of the economy. In this classification producer services includes the following industries: communication; banking, credit, and other financial services; insurance; real estate; engineering and architectural services; accounting and bookkeeping; miscellaneous business services; and legal services.

[49]This study uses the Equal Employment Opportunity data source which is a longitudinal data source consisting of individual establishment level data for 1974 and 1980. See Jonathan S. Leonard, "The Interaction of Residential Segregation and Employment Discrimination," *Journal of Urban Economics* 21 (1987):323-346.

blue-collar skills. Distance from the worker's residence to the work site was a significant deterrent to employment. This paper also found that residential segregation resulted in limited job opportunities for black men but not because of the migration of blue-collar job migration to the suburbs. Instead, this finding was attributed to increased commuting costs associated with employment sites located outside the ghetto. Limiting the residential location of workers limits the area in which they will seek employment.

Labor Force Participation

Unlike employment, the use of labor force participation may tend to understate the effect of the spatial mismatch.[50] Even while accounting for retired persons and school-aged children this variable may not capture the full extent of the spatial mismatch on labor force participation. For instance, one could define the eligible participation group as those individuals between the ages of 18 and 65, except for those individuals still in school, and those with small children. While this definition certainly narrows down the group and consequently the amount of understatement of the problem, there may still be some degree of miscounting. The decision to stay in school is partially dependent on the opportunities in the labor market. This definition implies that the decision to remain in school is an exogenous choice when it is actually endogenous. A similar kind of argument may be made for women with small children. Although, some of these women may wish to work, a depressed labor market may prevent this from being feasible. If the market offers low wages such that it becomes more feasible to remain at home than to pay day care bills, the woman will remain out of the labor force. Moreover, this undercounting may be more acute for the lower income individuals than for other income groups.

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[50]On the other hand, this variable may overstate the effect especially in the case of women.

In addition to undercounting this variable gives no information concerning how the quality of jobs have been affected by the spatial mismatch. Nor does this variable give any information on the number of jobs available due to the mismatch. Labor force participation focuses on only the supply of labor but does not directly provide information concerning the demand for labor.

Moore and Laramore also consider the effects on labor force participation rates of low-skilled inner-city residents.[51] Their results show that labor force participation has a strong historical nature to it so that labor force participation in 1980 is significantly related to labor force participation in 1970. This is by far the most influential variable in the model. The percentage change in the employment share of the manufacturing sector had a positive and statistically significant effect on the labor force participation of black females and nonblack males. This finding suggests that as more job opportunities become available, more individuals would enter the labor force. By the same argument, the percentage change in total employment, had a large positive influence on the labor force participation of all race/sex groups. An interesting result of this paper is that the percentage change in black employment had a significantly negative effect on the labor force participation rates of both white males and females.

Ellwood found that race had a much larger affect on the employment levels of black youth than did accessibility.[52] This lead to the statement that it was "race not space" which

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[51]Moore and Laramore, "Industrial Change and Urban Joblessness: An Assessment of the Mismatch Hypothesis."

[52]This study employs several data sources. The first of which is the 1975 Annual Housing Survey. The second is the 1970 Chicago Area Transportation Study. Both of these sources provide information on the residential and work site locations of individuals. In addition, the authors used the Census Employment Survey taken in 1970 of low income census tracts. See Ellwood, "The Spatial Mismatch Hypothesis."

was the problem.[53] Ellwood constructed three different measures of job accessibility in the employment equation.[54] The import ratio preformed best of all the accessibility measures, though the effects on employment were very small particularly when compared to the coefficients on the proportion of black families, the proportion of Spanish families, the proportion of poor families, and the proportion of the youth cohort in school.[55] On the other hand the most influential variables were race which had a negative effect, proportion of youth cohort in school which had a positive effect, and the proportion of individuals living in poverty which had a negative effect. In addition, Ellwood controlled for neighborhood effects by running separate equations for each of the 100 neighborhoods in Chicago and found that within the same neighborhood blacks and whites experienced different levels of employment. The results show that when job access was held constant, blacks had on average lower levels of employment than whites.

In contrast to Ellwood, Ihlanfeldt and Sjoquist found that residential location did indeed account for a significant portion of the black-white youth employment differential.[56] The authors employed ordinary least squares, simple logit and a multinomial logit model to estimate

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[53]Ibid., p. 149.

[54]Each of these measures is further defined in several different ways. The first measure is defined as the percentage of all jobs located within 30 minutes by transit or the percentage of all blue-collar and service jobs located within 30 minutes by transit. The second measure is defined as the import ratio of all workers, the import ratio of blue-collar and service workers, or the import ratio of teenagers. The last measure is defined as the average time travel for all workers, the average time travel for blue-collar and service workers, or the average time travel for teenagers.

[55]The import ratio is defined in this context as the ratio of jobs to workers in the city.

[56]The authors use data from the 1980 Public Use Sample of the Census of Population and Housing. See Keith R. Ihlanfeldt and David L. Sjoquist, "The Black Youth Unemployment Problem," Policy Research Program Working Paper No. 1 (Atlanta: Georgia State University, 1990).

the joint decision between participation in the labor force and/or remaining in school. Running separate regression for males and females, the results indicated that accessibility had as much an effect on the level of white youth employment as it did on blacks.[57]

Summary

In research spanning 20 years much insight has been gained into the impact of residential location on the economic status of inner-city individuals. Many studies have attempted to determine the extent to which inner-city residents are penalized for their residential location in the presence of job suburbanization. The most popular venue for this has been by empirical testing of the spatial mismatch hypothesis. This paper provides a survey of the literature on this topic and the various results which have been obtained from these studies.

According to this hypothesis, suburban housing market discrimination, in the face of continued migration of low-skilled employers to the suburbs, has resulted in decreased employment opportunities for minority residents in the inner city. Low rates of automobile ownership, poor means of reverse commuting through public transportation, and lack of information about suburban jobs makes the suburban labor market less accessible to inner-city residents. Both the reduction in accessibility and the migration of employment opportunities to the suburbs are crucial pieces of this argument. Without a reduction in employment opportunities in the central city, restriction to the suburban labor market would be an irrelevant constraint. On the other hand, if accessibility were not limited by housing market discrimination, the migration of firms would serve only to redistribute the employment sites of low-skilled individuals.

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[57]The rationale for this type of model is to capture the effect of endogeneity of the schooling decision. There is a simultaneous decision between the decision to attend school and the decision to enter the labor market.

The spatial mismatch hypothesis was first introduced and tested by John Kain in 1968. His findings indicated that housing market discrimination and job decentralization resulted in a substantial decrease in the number of jobs held by inner-city residents. Unfortunately, several weakness were found with this study, leaving his results suspect. Although, many other studies have since clarified our understanding of this issue, there still exists no consensus as to the effect of residential location on the economic status of inner-city residents.

Recent works on this topic are split into three categories based on their use of a dependent variable, labor force participation, earnings, or employment. Those testing the effect of residential location on labor force participation have usually concentrated their analysis on the youth in an effort to explain the racial differences in labor force participation among teenagers. Ellwood finds that race is a much more significant determinant of the labor force participation rates than residential location. In black and white neighborhoods with equal access to jobs, Ellwood finds that white teenagers are more likely to hold jobs than black teenagers. On the other hand, Ihlanfeldt and Sjoquist find that accessibility does affect this decision.

Studies that test the effect of accessibility on level of earnings of inner-city residents produce varying results. This is due in part to the different techniques used in the studies. One approach is to estimate wage gradients for an metropolitan area. The majority of these studies find that wages for low-skilled workers are higher in the suburbs than in the central city. Unfortunately, this approach does not provide any explanation for such a result nor does it provide information concerning other factors which may affect wages. A second group of papers estimates a straight-forward linear regression model. This approach furnishes information on the effects of each component of the regression equation, unlike the wage gradient. Such papers find that while accessibility matters, race is at least as significant a determinant of earnings.

The last group of papers find mixed results of the degree of access to the suburban labor market on the unemployment rate. Several papers conclude that low-skilled female workers have greater employment opportunities in the central city labor market than in the suburban labor market. Low-skilled male workers on the other hand would benefit from increased access to the suburban labor market.

As one must now realize there remains much work to be done on this subject. For instance, this author could find no papers using micro data on the labor force participation of adults, such as a study which tests the affect of the spatial mismatch hypothesis on the labor force participation of female householders. A study of this sort may provide needed insight into the increase of poverty among female-headed households. An additional variant to this type of study would be to consider the degree to which decentralization and accessibility contribute to underemployment or increased part-time employment among inner-city residents. Furthermore, considerable effort should be made to develop a general equilibrium framework for this hypothesis which would in turn lead to a systematic method for analyzing this issue. Such a model would illustrate the efficient location of both firms, disaggregated by skill level, and individuals, again disaggregated by skill level or education. An additional shortcoming of the previous studies has been the neglect of neighborhood factors and the effect of these factors on earnings, employment, and labor force participation. Several papers find that race has a significant affect on the level of earnings but these models do not include other demographic effects such as the degree of segregation and the degree and concentration of poverty of the worker's residential location which may also contribute to the earnings of an individual. To the extent that these factors are also correlated with race, the estimates of the effect of race on earnings will be biased. Instead of ignoring these factors, efforts should be made to incorporate them directly into the model.

Perhaps the most significant contribution yet to be tackled is the appropriate policy response to the entrapment of blacks in the inner city. If decentralization and accessibility do play a role in the socioeconomic status of inner-city residents, then what is the appropriate solution to this problem? Offering incentives to businesses to locate in the inner city would be very costly and would only serve to redistribute employment opportunities from the suburbs to the central city. This would not necessarily result in a gain to welfare. On the other hand, relocation of inner-city individuals to the suburbs may cause additional relocation of suburban residents in an effort to live away from minority individuals. The effect of this secondary relocation on jobs for low-skilled minority residents and welfare of the urban area as a whole has not been explored. Therefore, regardless of whether we are able to state with confidence the relationship between the socioeconomic status of inner-city individuals and the decentralization of jobs, additional studies should focus on the development of policy responses if in fact a relationship does exist.

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