Preliminary draft

Spatial Mismatch and Urban Labor Markets in the United States: Evidence for Blacks, Immigrants and Hispanics

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Abstract

Our work updates and extends the empirical literature on spatial mismatch in US cities by incorporating contemporary demographic phenomena. In particular we account for the tremendous influx of immigrants and the changing ethnic compositions of cities, especially the increased share of Hispanics. We use data from the 2000 Census Transportation Planning Package (CTPP) to examine urban labor markets in 276 large cities in the United States for four demographic groups: blacks, Hispanics, immigrants and whites. Using data organized by both place of work and place residence at the census tract-level within each metropolitan area, we define spatial mismatch indices in a unique way. We find statistical evidence that blacks experience adverse labor market outcomes in the presence of spatial mismatch while controlling for the presence of immigrants and Hispanics. The magnitude of the marginal effects of the spatial mismatch indices are quantitatively small; however, the aggregate effects of being in one of the six "gateway" states—major immigrant destinations in recent years--are quantitatively large. In addition, we find that the other minority study groups, immigrants and Hispanics, also experience adverse labor market outcomes in the presence of the spatial mismatch of jobs and their residences. In contrast, whites' labor market outcomes appear not to be related to spatial mismatch indices.

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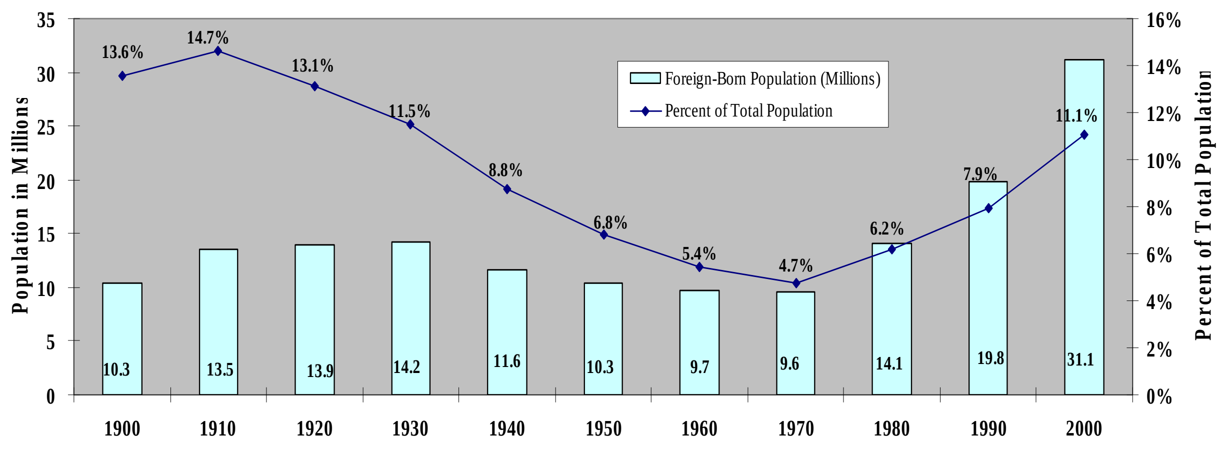
1. Introduction

One of the primary insights of the spatial mismatch hypothesis, first formulated by Kain (1968), is to suggest a linkage between the decentralization of jobs in American cities and the high unemployment and low wages of central city minority households, particularly blacks. Job decentralization harms the labor market outcomes of these residents because of their more central residential locations and a variety of barriers that keep them from adjusting either their commuting behavior or place of residence to change in the spatial distribution of metropolitan job opportunities. The spatial mismatch hypothesis (SMH) posits that blacks have relatively poor labor market outcomes due to a mismatch between job locations and housing locations. The sources of the mismatch come from a variety of avenues including racial discrimination in the labor market and suburban housing market. Many studies document that the spatial mismatch between the location of blacks and jobs is partly responsible for the inferior labor market outcomes experienced by many blacks (see Ihlanfeldt and Sjoquist, 1998; and Gobillon, Selod and Zenou, 2007).

Immigrant flow is another important impact on the U.S. labor market. Since 1990, the number of foreign-born persons living in the United States has been increasing rapidly. Figure 1 depicts both the number of immigrants and the share of the population that is foreign-born by decade[1]. In 2000, the number of immigrants in the U.S. reached 31.1 million – a population three times larger than that in 1900. Between 1990 and 2000, the foreign-born population increased by 57 percent, from 19.8 million to 31.1 million. According to the U.S. Census Bureau report, that number reached 33.7 million in 2003. Today, immigrants make up approximately 12 percent of the total population and 14 percent of the total civilian labor force. Given the continued growth of the foreign-born population, immigrant labor force participation could be important for the future growth of the labor movement in the United States.

[1] Audrey Singer (2004), "The Rise of New Immigrant Gateways".

Figure 1. Total Foreign-Born and Percent Foreign-Born in the United States, 1900-2000



Source: "Profile of the Foreign-Born Population in the United States: 1997," Current Population Reports, Special Studies P23-195, Figure 1-1; Table DP-2: Profile of Selected Social Characteristics: 2000, U.S. Bureau of the Census.

Since Karin's (1968) study of blacks in Chicago and Detroit, many researchers have found support for an inverse relation between measures of spatial mismatch and the labor market outcomes of blacks for many US cities using data from the 1960s to the 1990s. We use the most recent US data from 2000 add a new twist to the analysis, that of controlling for recent important demographic trends, the increasing presence of immigrants and Hispanics. In addition, we examine if immigrants and Hispanics labor market outcomes are influenced by spatial mismatch working within their own demographic group. An important element of our analysis is to construct a spatial mismatch index from a small spatial scale to measure job accessibility for each of the minority study groups – non-Hispanic blacks, immigrants and Hispanics. Non-Hispanic whites will serve as a comparison group. This paper is organized as follows. Part 2 reviews previous work and provides a brief description of a model of spatial labor markets in an ethnically diverse city. Part 3 describes the data and the constructed variables. Part 4 shows the empirical analysis and methods used. Part 5 presents the results and conclusions are discussed in Part 6.

2. Framework

2.1. Background on Spatial Mismatch

In the past few decades, a growing body of research on the spatial mismatch hypothesis has been tested in many empirical studies. Kain (1968), the pioneer on spatial mismatch studies, estimated the effect of residential segregation on relative black employment in various neighborhoods of two metropolitan areas, Chicago and Detroit. The investigation was prompted by concern that racial segregation in metropolitan housing markets may further reduce the employment opportunities of blacks who are already harmed by employer discrimination and low levels of education. In addition, it seems possible that the extensive growth of metropolitan areas and the rapid postwar dispersal of employment may have placed the black job seeker in an even more precarious position. Kain also argued that this situation is the result of the growing job decentralization in U.S. cities, combined with explicit or implicit constraints on the household choice of residence by blacks.

Mooney (1969) examined the impact of housing segregation on the employment opportunities of segregated blacks using the 1960 PUMS data of the twenty-five largest Standard Metropolitan Statistical Areas (SMSA's). He found that federal and monetary policies which affect the unemployment rate may have a disproportionate effect on central city employment. The second major finding of Mooney's study is that the growing employment sectors (selected services, finance, insurance and real estate) in the central cities are large employers of females. Offner (1971) used Karin's Chicago data to examine Karin's theory and argued that it suggests a non-linear relationship between the employment ratio and the residence ratio. He re-estimated the relation in a non-linear form and found that a redistribution of blacks throughout the population would result in relatively large black job losses where discrimination is most important. Ihlanfeldt and Sjoquist (1990) examined the relationship between the nearness of jobs and youth job probability. They found that the nearness to jobs has a strong effect on the job probability of both black and white youth living in Philadelphia, regardless of their age, enrollment status, or whether they live at home or on their own. Also the differential job access was found to explain a large portion of the racial difference in youth employment rates. Stoll and Raphael (2000) presented an analysis of spatial job search patterns of the black, white, and Latino workers in Los Angeles. They found that blacks and Latinos tend to search in areas where employment growth is low, whereas whites tend to search in areas where it is high. The results of their paper are consistent with the existence of spatial mismatch in urban labor markets and imply that racial residential segregation limits the job opportunities of blacks in metropolitan areas. This implies that spatial search barriers are an important source of observed racial differences in employment outcomes. Stoll, Holzer, and Ihlanfeldt (2000) indicated that less-educated people and those on public assistance mostly reside in areas with minority populations. Low-skilled jobs are quite scarce in these areas, while the availability of such jobs relative to less-educated people in heavily white suburban areas is high.

The spatial mismatch hypothesis continues to be a popular topic for current urban economic research. Holzer and Reaser (2000) use data from a new survey of employers in four large metropolitan areas – Atlanta, Boston, Detroit, and Los Angeles – to analyze the flow of black applicants to different kinds of employers and the extent to which these applicants are hired. Their results show that less-educated black workers apply less frequently for jobs in the suburbs than in the central cities, especially at smaller establishments and suggested that the need for policies to improve the access of less-educated blacks to suburban employers, and also more effective enforcement of anti-discrimination laws in suburban establishments. Raphael, Stoll, and Holzer (2000) suggest that white suburban firms are no more discriminatory than white central city firms, and that much of the mean difference in racial hiring and application outcomes among white firms may be attributed to spatial frictions. They also find that both suburban black and white employers hire fewer blacks than their central-city counterparts. Boardman and Field (2002) evaluated the relationship between job proximity and male joblessness at the neighborhood level in Cleveland and Milwaukee. They found that predominantly black neighborhoods in both cities have higher rates of male joblessness. In addition, predominantly black neighborhoods have higher average commute times, suggesting that spatial isolation from employment may be better characterized along a temporal rather than a physical dimension. Brueckner and Zenou (2003) analyze the effects of housing discrimination on the wages and unemployment rates of black workers. They find that suburban housing discrimination leads to a higher unemployment rate for blacks in the central city than in the suburbs. Martin (2004) analyzes the impact of employment and population shifts in U.S. metropolitan areas from 1970 to 2000 on a spatial mismatch index to determine how metropolitan residents react to changes in the spatial distribution of metropolitan employment. The results show that residents tend to move away from areas gaining jobs. Black residents, on the other hand, appear to be attracted to areas that are experiencing employment growth.

These empirical studies have tested different dimensions of the Spatial Mismatch Hypothesis (SMH) by using aggregate level and individual level data. Although the majority of the findings support the SMH, inconsistencies do exist. The findings, especially in the

1990s, are more consistent and support SMH. Most empirical studies have focused on testing how the employment ratio is affected by job accessibility and other variables and how the employment ratio affects job accessibility and other variables in turn.

2.2 *Theoretical Perspectives*

Brueckner and Martin (1997) proposed a theoretical model to investigate the effect of housing market discrimination on the labor-market outcomes of blacks. They constructed a spatial mismatch model to show how job decentralization and housing market discrimination combined to depress the labor market outcomes of blacks in a standard urban economics framework. We can extend DeSalvo's (1985) urban household model and follow Brueckner and Martin's model to consider a closed linear city with an employment center at each end of the segment : the Central Business District (CBD) and the Suburban Business District (SBD) and assume that these centers form two separate local labor markets. We also extend this model from two household types to three household types, whites, blacks and immigrants. The households reside in the city and work in the CBD or SBD. Two cases of the spatial mismatch analysis can be discussed. The first one is the unrestricted case, in which black residents are not restricted in their choice of a place of residence. The second is the restricted case with housing market discrimination including the restriction that black workers are not allowed to relocate in response to job decentralization.

To simplify the model, we assume that wages are exogenous. We can then derive labor supply as a function of the distance from residential location to the employment centers. For the firm side, we simplify the production technology to have three types of labor as inputs and assume that the productivity of distant workers is lower than closer workers. Moreover, we assume that wages vary by the distance from residential location to employment center due to the compensation for a long distance commute to work. We can also derive labor demand as a function of the distance from residential location to the employment centers using a firm's profit maximization model. Then, we can combine labor supply and labor demand to find the equilibrium residential location for each group on the labor market.

2.3. The Effect on Blacks Labor Market

In general, we get the following labor supply and labor demand functions:

$$LS_g^i = f(x;z)\ i \in \{c,s\};\quad g \in \{\text{whites, blacks, immigrants}\} \tag{1}$$

$$LD_g^i = k(x;z)\ i \in \{c,s\};\quad g \in \{\text{whites, blacks, immigrants}\} \tag{2}$$

where x represents the distance from residential location to employment centers; z represents other characteristics that influence labor supply and labor demand, such as transportation mode, commuting time, wage rate etc.

Basically, there is a negative effect of the distance from residential location to employment center on labor supply. Workers may refuse a job that involves a long commute time, and/or sometimes the out-of-pocket transportation cost could be too high compared to the offered wage. Therefore, the relationship between the distance from residential location to place of work and labor supply is negative, which implies the labor supply function is downward sloping as a function of the distance from residential location to employment center. As for the view of labor demand, employers may refuse to hire distant workers because commuting long distances to work makes them less productive since the distant workers are more tired at work after a long travel time to work. More likely employers will assume distant workers will be late to work or even absent. The relationship between the distance from residential location to place of work and labor demand is also negative, which states the labor demand function is also downward sloping as a function of the distance from residential location to place of work. However, our study focuses on the labor supply side in the empirical analysis, to which we now turn.

3. Data

The data analysis focuses on between-city differences in labor market outcome for the four study groups: non-Hispanic whites, non-Hispanic blacks, Hispanics and immigrants. Our sample includes 276 MSAs and CMSAs (hereafter often referred to as “metropolitan areas” or “cities”) using the 1999 OMB definitions[2]. Data is drawn from two sources: the Census Transportation Planning Package (CTPP) 2000 and from the Summary File 3 (SF3) of the US Census 2000. One of the unique aspects of the CTPP package is that it reports data by place

[2] The metropolitan areas as defined by office of Management and Budget (OMB) in 1999 are used in the Census 2000 publications.

of work as well as by place of residence,[3] and we use both sources to construct our variables. The employment sample used in this study is drawn from Part II of the Census Transportation Planning Package 2000, and includes 102,423 census tracts within the 276 metropolitan areas. In contrast, the residence sample is drawn from Part I of the Census Transportation Planning Package 2000, and includes 117,057 census tracts[4] within metropolitan areas.

3.1 Study Groups

We focus on four study groups, of which three can be viewed as minority groups: non-Hispanic blacks, Hispanics and immigrants. The fourth study group, non-Hispanic whites is for comparison purposes. Note that we are using the 2000 census definitions for racial and ethnic status, and these definitions are not completely comparable to earlier census definitions. For exposition purposes we will often drop the "non-Hispanic" modifier and refer to the demographic groups as blacks and whites.

Some discussion about terminology concerning "immigrants" is important to our study. The terms "immigrant" and "foreign-born" are used interchangeably to describe all persons living in the U.S. who were born in another country and were not born abroad to a U.S. citizen parent. In official parlance, the Bureau of Citizenship and Immigration Services uses the term "immigrant" to denote a person admitted to the U.S. for permanent residence. The Census Bureau considers anyone who is not born a U.S. citizen to be foreign-born. Although the U.S. Census contains a question on birthplace, it does not ask about a foreign-born person's legal status. It is not possible to determine whether a person born outside the U.S. is here, for example, as a legal permanent resident, a temporary worker or student, or whether they are undocumented. Therefore, we ignore the legal status for immigrants in our study and define immigrants to be the population that is foreign born, regardless of legal status.

We construct several variables from the data including the dependent variable employment ratio and several independent and control variables. Some of the right-hand-side variables are spatial mismatch indices, residence ratios, location descriptor variables for states and MSAs and CMSAs, urban spatial structure measures, travel mode and commuting

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[3] The Census Transportation Planning Package (CTPP) is a collection of summary tables that have been generated from the census long form data collected in year 2000. These summary tables contain three sets of tabulations: Part I – By Place of Residence, Part II – By Place of Work, and Part III – Journey-to-Work.

[4] Note that the number of census tracts from part I--the residence sample—is greater than the number of tracts from part II—the employment sample. Some census tracts only contain workers' residences, but have no workers employed there.

characteristics as well as demographic characteristics of the study groups. Descriptive statistics are provided in Table 1.

3.2. Spatial Mismatch Indices

Important right-hand side variables are the spatial mismatch indices which we construct from micro-geography using the 2000 CTPP data Parts 1 and 2. The indices[5] are constructed for each demographic group in each metropolitan area by using census tract level data from the employment and residence tables from the CTPP. Conceptually, the indices measure the dissimilarity between residence and jobs for sub-geographic units of the metropolitan areas. In other words, the spatial mismatch index is a measure on the geographic proximity of residents to jobs. The spatial mismatch index ranges between 0 and 100; larger index values represent higher dissimilarity between residence and employment. A greater index number means that a higher percentage of residents would theoretically have to move to equalize the spatial employment distribution within a geographic area. The index can be interpreted as a measure of the degree of spatial mismatch.

The spatial mismatch index for metropolitan area *k* for group *g* is calculated as:

$$SMI_k^g = \frac{1}{2} \cdot \sum_{i=1}^{N_k} \left| \left(\frac{p_{ik}^g}{P_k^g}\right) - \left(\frac{e_{ik}}{E_k}\right) \right| \qquad (3)$$

where p_{ik}^g is the total population of group *g* who live in census tract *i* in metropolitan area *k*; P_k^g is the total population of group *g* who live in metropolitan *k*; e_{ik} is the total employment of census tract *i* in metropolitan area *k*; E_k is the total employment in metropolitan area *k*, and N_k is the number of census tracts belonging to metropolitan area *k*.

Table 1 reports the average spatial mismatch indices across the 276 metropolitan areas. The largest average value of the index is for blacks (68) followed by Hispanics (64), immigrants (61) and whites (55). While not shown in the table, it is interesting to note patterns in the individual indices. Seventeen metropolitan areas have spatial mismatch indices over 80 for blacks, 13 cities for Hispanics, three cities for immigrants and only one city for

[5] We use a variant of the spatial mismatch index developed by Martin (2000). The index is based on the dissimilarity index used to study residential segregation (Duncan 1955; Taeuber, 1965).

whites. That one city is Grand Forks, North Dakota, and interestingly all indices for all four groups are greater than 80 there.

3.1. Employment Ratio

We use the employment ratio as our dependent measure, a measure of labor market outcomes. To construct the ratio, we use the employment tables drawn from Part II of the Census Transportation Planning Package 2000. The universe of the employment sample is all workers. We define the employment ratio as the ratio of group *g's* employed population over total workers in a metropolitan area.

$$E_k^g = \frac{\text{group } g \text{ workers employed in Metro Area } k}{\text{Total \# of workers employed in Metro Area } k} \tag{4}$$

where E_k^g denotes the employment ratio of metropolitan area k for each group.

3.3. Residence Ratio

We use the residence ratio as one of our independent variables and construct it from tables based on Part I of the Census Transportation Planning Package 2000 (by place of residence). Again we define the universe of the residence sample to be all workers. We construct the residence ratio for each group of workers, defined as the ratio group g workers residing in a metropolitan area over the total number of workers who lived in that metropolitan area.

$$R_k^g = \frac{\text{group } g \text{ workers living in Metro Area } k}{\text{Total \# of workers living in Metro Area } k} \tag{5}$$

where R_k^g denotes the residence ratio of metropolitan area k for each group g.

3.4. Other Variables

Average Annual Earnings in 1999

In order to define earnings for immigrants we were forced to use information from the CTPP rather than the census SF3 file directly. The SF3 file provides average income at the msa/cmsa level for whites, blacks, and Hispanics, but not for immigrants. So to keep the definitions consistent for each group, we calculated the weighted average income for each group using CTTP data organized by place of work. First, we calculate the share of annual earnings broken down into 11 categories[6] for each group. The share of annual earnings of each category for each group is calculated as the workers earning for each category over the total population of group *g* in metropolitan area *k*. Second, we construct the average annual earnings for each group, which is calculated by median annual earnings of each category weighted by the share of annual earnings of each category for group *g* in metropolitan area *k*.

Means of Transportation to Work

The means of transportation to work data are divided by three categories[7], which are drove car, public transit, and other. We calculate the share of each transportation mode as the number of people taking each mode over the total population of group *g* in metropolitan area *k* for place of work. Non-Hispanic whites are the group most likely to drive to work, while blacks are the group most likely to take public transit.

Travel Time to Work

There are 16 categories[8] for the travel time to work data. We first calculate the share of travel time to work for each category, which is the number of population of each category of travel time to work over the total population of group *g* in metropolitan area *k*. We then construct the weighted average travel time to work of each group for place of work by using the median travel time to work of each category weighted by the share of travel time to work of each category for group *g* in metropolitan area *k*. Since travel time to work data for immigrants are not available in CTPP 2000, we are only able to construct travel time to work for the following groups: whites, blacks and Hispanics. Table 1 shows very little difference the average travel time to work by demographic group: the typical commute is about 22-23 minutes across all groups.

Vehicles Available

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6 The 11 categories of annual earnings are no earnings; less than $5,000; $5,000 to $9,999; $10,000 to $ 14,999; $ 15,000 to $19,999; $20,000 to 24,999; $25,000 to 29,999; $ 30,000 to $ 34,999; $35,000 to 49,999; $50,000 to 74,999; $75,000 or more. We assign a value of $99,999 to the open interval.

7 Drove car to work includes driving car alone to work and carpool; Public transit includes bus, streetcar, trolley car, subway, railroad and ferryboat; Other means of transportation to work includes taxicab, motorcycle, bicycle, walked to work and worked at home.

8 The 16 categories are less than 5 minutes; 5 to 9 minutes; 10 to 14 minutes; 15 to 19 minutes; 20 to 24 minutes; 25 to 29 minutes; 30 to 34 minutes; 35 to 39 minutes; 35 to 39 minutes; 40 to 44 minutes; 45 to 49 minutes; 50 to 54 minutes; 55 to 59 minutes; 60 to 74 minutes; 75 to 89 minutes; 90 or more minutes and worked at home. We assign a value of 104 minutes to the open ended interval.

Vehicles available data are only divided into two categories: households owning no cars and those who own one or more cars. The universe of this data is workers in households. We calculate the share of each vehicle's category as the number of workers in each category over the total population of group *g* in metropolitan area *k*. Car ownership rates average 90% and more for all groups (Table 1). But the most dramatic finding is that blacks are about four times as likely as whites to not own a car; about 10% of black workers do not own a car compared to only about 2% of whites.

Demographic Characteristics Variables

We use demographic characteristics such as median age, gender, and education as control variables. We again, however, encounter data limitations when trying to obtain these measures for immigrants. The Census Bureau data sets used here do not break down that information by foreign-born status. In contrast, the data is easily obtainable for whites, blacks and Hispanics. Median age by MSA/CMSA comes directly from the SF3 files. We construct our measure of gender by calculating the percentage of male workers as the ratio of total male workers over total workers times 100 in a metropolitan area. The education level data are divided into three categories. The first is no high school diploma and lower, and the second includes high school diploma and higher but no college degree, and the third indicates college degree and higher. We then calculate the share of each education level as the number of persons attaining each level over the total population of group *g* in metropolitan area *k*.

Location Descriptors: Gateway Dummy, Metropolitan Population, Number of Employment Centers

During the 20th century, six states reigned as the primary regions of immigrant settlement: California, Texas, New York, New Jersey, Illinois, and Florida; 69 percent of all foreign-born people lived in these six states in 2000 (Table 2). Hence, we define these six states as "gateway" states and create a dummy variable to indicate if a metropolitan area is in one of the gateway states. The value of the dummy equals one if a metropolitan area is in one of the six gateway states; it equals 0 if a metropolitan area is not in one of the six gateway states. The gateway state variable proxies the attractive force of these states for immigrants. We find that 78 metropolitan areas (28%) are in a gateway state (Table 1).

We also want to have variables describing the local metropolitan area, and we have used two measures. The first is total (resident) population of the metropolitan area, which comes from the Census SF1 files, 100% count. The second measure describes the urban spatial structure of employment by counting the number of employment centers in a metropolitan area. The data comes from Dan McMillen and was used in a recent paper by McMillen and Smith (2003). The data consists of the number of employment centers (ranging from 1 to 47) estimated using nonparametric methods for 62 large cities. We assume cities not in his sample are monocentric and so have one employment center, representing the CBD. In our data set (Table 1), the average number of employment centers is about 2, and the two cities with the most employment centers are New York City with 39 and Los Angeles with 47.

4. Empirical Specification

Our empirical strategy has two main parts. First, we examine the relationship between the employment ratio and spatial mismatch indices in a base model only controlling for characteristics of the relevant study group. We extend previous work on blacks to examine whether immigrant and Hispanic workers labor market outcomes are negatively related to spatial mismatch indices. Second, we test the robustness of our results in the base model to other specifications and investigate if immigrants and Hispanics living in the same city have an impact on blacks' labor market outcomes. We report our results for the study groups: blacks, immigrants, and Hispanics, and for the comparison group, whites.

Our methodology is simple; we estimate regressions using OLS with robust standard errors. We can summarize our approach by the following two population regression models, one a base model and the second with added controls. The base model specification is given by:

employment ratio = f(*spatial mismatch index, commute time, car availability,* (6)
urban area controls, gateway state location controls, demographic controls) + *error*

where the employment ratio is calculated for each of the four study groups: whites, blacks, immigrants and Hispanics. The augmented model adds measures of competing groups to the base model:

employment ratio = f(*spatial mismatch index, residence ratio of competing groups,*
commute time, car availability, urban area controls, (7)
gateway state location controls, demographic controls) + *error*

5. Estimation Results

Estimation results are reported in two sets of tables, Tables 4-6 and Tables 7-9. The two groups of tables differ only in the descriptive control for the metropolitan areas. Tables 4-6 use total population as a control variable while Tables 7-9 instead controls for the number of employment subcenters. Within each grouping of tables we first focus on the base model with spatial mismatch indices and location and personal controls. Then the next two tables report results for the augmented model with measures of competition in the labor market, the presence of competing groups.

5.1 Results from the Base Model for Blacks, Hispanics, Immigrants and Whites

The results from estimating the base model shows that the coefficients on the spatial mismatch index are negative and statistically significant for the three minority groups. This is in contrast to the outcome for whites, where the coefficient on the spatial mismatch index is statistically insignificant. We find mild support for all three minority groups, blacks, Hispanics and immigrants, for a negative relation between their labor market outcomes and measures of their spatial disconnection. We must emphasize the small magnitudes of the impacts, all less than 1 percentage point. For example a 1 percentage point increase in the spatial mismatch index of blacks is associated with less than a percentage point decrease in black's employment rations. The small magnitude is perhaps reflective of the small proportions of the metropolitan area workers that each of the group has (all under 9% as reported in Table 1).

The coefficients with the largest magnitudes, are the coefficients on the gateway state dummy. Again the pattern differs over demographic group. Blacks' employment ratios are likely to be over 4 percentage points less if they in states with recent large influxes of immigrants Whites employment ratios are likely to be over 10 percentage points lower in the gateway states. And as expected, the coefficients are positive for immigrants and Hispanics.

5.2. Results from the Augmented Model: Immigrants and Hispanics and Blacks Outcomes

The results for blacks from the base model are at least consistent with the workings of the spatial mismatch hypothesis, so it is natural to further investigate the robustness of the coefficients on the spatial mismatch index and the gateway state dummy when we account for demographic patterns at the local metropolitan level. The same holds true for Hispanics and immigrants. We now add measures of competing labor groups to the base model, in particular we examine if immigrants and Hispanics have an impact on labor market outcomes of blacks. And to be balanced, we examine if whites and blacks have an impact on labor market outcomes of Hispanics and immigrants. Table 5 reports the results for whites and blacks and Table 6 shows the results for Hispanics and immigrants. The pattern for blacks is robust whether or not the competing group is the recent influx of immigrants or the recent increase in the number of Hispanics (as measured by their residence ratios), the coefficient on blacks spatial mismatch index is about -0.30 (and statistically significant), the same as in the base model.

In contrast, the coefficients on the spatial mismatch index are different depending on which group is the control group. When white's residence ratio is added as an independent variable, the coefficient on the spatial mismatch index for Hispanics and immigrants are about the same as in the base model. That does not hold true when the control group is blacks. The spatial mismatch coefficients are greater in magnitude by about a factor of three for Hispanics and a factor of two for immigrants. It appears there is a stronger link between blacks and Hispanics and immigrants than between whites and Hispanics and immigrants.

The pattern of the coefficients on the competing groups' residence ratio also shows some interesting results. First, consider blacks employment outcomes in Table 5. The coefficients on the immigrants residence ratio is larger in magnitude by a factor of two than the coefficient on Hispanics residence ratio (-.17 vs. -.07). Second consider Hispanics and Immigrants employment outcomes in Table 6 the coefficients on blacks residence ratio is smaller in magnitude by more than a factor of three when compared to the coefficient on whites residence ratio (-.56 and -.15 for Hispanics and -.27 and -.07 for immigrants).

It is also interesting to note what happens to the coefficients of the gateway dummy when adding the competing labor group controls. As expected the coefficients on all gateway dummies fall in magnitude when within urban area measures of immigrants are added. The fall in the magnitude of the coefficient is perhaps to most dramatic for whites and the least dramatic for immigrants.

5.3 Robustness Checks Using Alternative Measures of Urban Spatial Structure

In thinking about local labor markets and the decentralization of jobs, we were curious to test whether or not the type of job decentralization mattered to labor market outcomes. In the latter part of the 20^{th} century many large urban areas in the US experienced polycentric development along with general job decentralization. What that means is that in addition the traditional CBS, other outlying centers of employment have developed. These outlying centers, may have employment densities that rivals that of the traditional downtown. So one way we thought to measure the polycentricity was to simply count the number of employment centers in the metropolitan areas. To do so would be quite a task econometrically. Luckily we were able to obtain some results about the number of subcenters by large urban areas estimated by Dan McMillen. Tables 7-9 report the results; the specifications only differ from the previous three tables by what measure we used to describe the metropolitan area. In Tables 4-8 we used the total population, and here instead we use the count of the number of employment centers. We find the coefficients on the variable of interest, the spatial mismatch index do not change when we use this variable. So the results are robust to these alternative measures. It is interesting to note in examining the coefficients on the number of employment centers, that the coefficient is only significant in two regressions, both running the base model. The coefficient is negative (and significant for whites) but positive and significant for Hispanics. The coefficients all become indistinguishable from zero when we use the augmented specification allowing for the competing labor groups.

We also conducted robustness checks for two other areas of interest: the specification of the dependent variable and the examination of city-size effects. Supporting tables are not presented here, but we will summarize our findings. First, we used a different specification for the dependent variable, the employment rate, rather than the employment ratio. The employment rate data does not come from the CTPP, but from the SF4 data set from Census 2000. We were not able to get that data for foreign-born (immigrants), so we could only focus on blacks, whites and Hispanics. The employment rate for a group in a particular metropolitan area is defined as the (number of workers in a group/ total labor force)*100. Our measure of a group's employment rate differs from our measure of the employment ratio in that the denominator or the employment rate is the labor force of a metropolitan area (vs. the number of workers in the employment ratio from the CTPP data). We find the results using the employment rate as the dependent variable to mirror our findings using the employment ratio for blacks, whites and Hispanics. Because we could not define the immigrant employment rate, for immigrants in a like-manner, we conclude that we prefer our findings using the employment ratio.

To examine city-size effects we divided our data on 276 cities into large and small (or "not large") cities using two separate cut-offs for large: metropolitan area population one million and greater, and population 500,000 and greater. There were 50 metropolitan areas of at least one million and 89 with at least 500,000 residents. We did this because spatial mismatch is often perceived to be a "big-city" problem. Our robustness results support this perception to some extent. The pattern of results is very similar to our original tables: the coefficient on the spatial mismatch index is not significant for whites, but is for the minority groups, so we continue to find support for a negative relation between employment outcomes and spatial mismatch. Moreover, the coefficients on the spatial mismatch index are greater in magnitude for the large vs. not-large cities for both cut-offs. The magnitude of the coefficients are greater for the spatial mismatch indexes in the cities over one million in population (compared to the coefficients in the sample with the 500,000 cutoff). For example, the negative and significant coefficient on the spatial mismatch index for black is -0.49 for cities of at least 1 million and -0.35 for cities of 500,000 or more. The only exception occurs for Hispanics where the coefficients on their spatial mismatch index is not significant when large cities are defined as by the 1 million population cutoff, but is when the cutoff is 500,000 (coefficient is -.73). We interpret this as being indicative that blacks experience more intense negative outcomes in large cities than do other minorities studied here.

6. Conclusion

In the past few decades, several studies have found that blacks experienced spatial mismatch in different subsets of U.S. cities. In contrast, our paper looks at the entire set of large U.S. cities at the MSA/CMSA level to examine whether or not spatial mismatch indices are negatively related to the labor market outcomes of blacks in 2000. We find that pattern to hold. Furthermore we find a negative relation between labor market outcomes for Hispanics and immigrants and measures of their own spatial mismatch indices. In contrast, our control group, whites do not seem to have a well-defined negative relation between labor market outcomes and the spatial mismatch index for whites. Our findings are at least consistent with the workings of the spatial mismatch hypotheses augmented to several minority groups.

Using non-spatial frameworks, some previous studies have found evidence that immigrant flows have a negative impact on native workers' labor market outcomes. For example, Card (2001) use 1990 census data to study the effects of immigrant inflows on occupation-specific labor market outcomes. The findings imply that immigrant inflows over the 1980's reduced wages and employment rates of low-skilled natives in traditional gateway cities like Miami and Los Angeles by 1-3 percentage points.

In our spatial framework, we too can investigate the relation between immigrants and native minorities. In our augmented model regressions, we do find statistical evidence of a negative relation between the presence of immigrants and Hispanics and blacks' labor market outcomes as measured by the employment ratio. It is interesting to note that while statistically significant, the magnitude of the coefficients on the residence ratios of competing groups are much smaller in magnitude than the coefficient on the spatial mismatch index of blacks (and smaller than Card, 2001, estimates in his non-spatial framework).

While it is tempting to interpret the pattern as causal, we hesitate to do so at this time. There are many unsolved specification issues that must be addressed before we would be willing to make such a claim. At the very least the spatial mismatch coefficient might be biased due to omitted variable bias (recall that several control variables were not able to be collected for immigrants). Other issues involve possible endogeneity problems concerning the spatial mismatch index itself and our measures of commute time (both could be outcomes of optimizing choices). A third potential endogeneity problem concerns including the immigrant residence ratio as a regressor. The immigrant residence ratio may not be exogenous if immigrants locate precisely where there is employment growth.

Table 1: Data Set Characteristics for All MSAs and CMSAs in 2000

Variables	Groups			
	White, Non-Hispanic	Black, Non-Hispanic	Hispanic	Immigrants[3]
Employment Ratio[1] (%)	79.37	8.65	8.06	7.94
	(15.62)	(9.08)	(13.55)	(7.46)
Residence Ratio[2] (%)	79.16	8.78	8.08	8.08
	(15.74)	(9.26)	(13.61)	(7.56)
SMI (%)	55.18	67.93	64.13	60.63
	(7.38)	(8.42)	(8.21)	(7.47)
Average Annual Earnings in 1999 (in $1,000)	30.44	23.70	21.70	26.48
	(3.78)	(3.62)	(2.91)	(4.25)
Means of transportation to work				
drove car (%)	92.21	86.54	88.42	88.48
	(3.26)	(7.66)	(6.75)	(6.06)
public transit (%)	0.92	4.86	2.71	2.42
	(1.49)	(5.36)	(3.62)	(3.44)
Other (%)	6.87	8.60	8.87	9.09
	(2.46)	(5.08)	(4.73)	(4.11)
Average Travel Time To Work	22.34	22.32	22.78	
	(2.94)	(4.16)	(3.51)	
Vehicles Available				
none (%)	2.41	10.14	7.37	5.77
	(0.80)	(5.17)	(4.44)	(2.75)
one or more vehicles (%)	97.59	89.86	92.63	94.23
	(0.80)	(5.17)	(4.44)	(2.75)
Demographic Characteristics				
Median age	37.94	28.59	24.62	
	(4.10)	(3.10)	(2.47)	
Gender				
Male (%)	48.91	51.96	53.34	
	(1.03)	(7.18)	(3.84)	
Female (%)	51.09	48.04	46.66	
	(1.03)	(7.18)	(3.84)	
Educational Level				
No high school diploma and lower (%)	21.15	37.66	50.63	
	(7.71)	(23.43)	(15.87)	
high school diploma and higher, no college degree (%)	42.48	42.16	30.02	
	(5.42)	(9.67)	(9.48)	
College degree and higher (%)	36.37	20.18	19.35	
	(8.51)	(8.30)	(10.17)	
Other controls				
Total population (in 100,000)	8.19	8.19	8.19	8.19
	(19.58)	(19.58)	(19.58)	(19.58)
Gateway dummy	0.28	0.28	0.28	0.28
	(0.45)	(0.45)	(0.45)	(0.45)
Number of Employment Centers	1.99	1.99	1.99	1.99
	(4.16)	(4.16)	(4.16)	(4.16)
N	276	276	276	276

Source: Census Transportation Planning Package(CTPP) 2000, part 1 and part2.
U.S. Census Bureau, Census 2000 SF1, SF2, and SF3

Notes: 1. Percent of total employment for each group is calculated by (number of workers for each group/Total employment)x100.
2. Percent of Total Residence Population for each group is calculated by (number of residents for each group/Total residents population)x100.
3. Due to data limitation for immigrants, travel time work and personal characteristics are not available in this study.
4. standard deviations are in parentheses

Table 2: Total Population and Foreign-Born Population by States, 2000

State	Total Population	Total Population Share (%)	Foreign-born Population						
			Population	Share (%)	Rank	Entered 1990 ~ 2000	Rank	Entered 1980 ~ 1989	Rank
All States	281,421,906		31,107,889			13,178,276		8,464,762	
California	33,871,648	12.04	8,864,255	**28.495**	**1**	3,270,746	**1**	2,893,396	**1**
New York	18,976,457	6.74	3,868,133	**12.435**	**2**	1,561,609	**2**	1,073,186	**2**
Texas	20,851,820	7.41	2,899,642	**9.321**	**3**	1,335,524	**3**	791,618	**3**
Florida	15,982,378	5.68	2,670,828	**8.586**	**4**	1,030,449	**4**	688,559	**4**
Illinois	12,419,293	4.41	1,529,058	**4.915**	**5**	687,564	**5**	364,092	**6**
New Jersey	8,414,350	2.99	1,476,327	**4.746**	**6**	614,416	**6**	395,071	**5**
Massachusetts	6,349,097	2.26	772,983	2.485	7	312,288	9	198,262	7
Arizona	5,130,632	1.82	656,183	2.109	8	317,381	8	161,402	8
Washington	5,894,121	2.09	614,457	1.975	9	286,439	10	149,405	10
Georgia	8,186,453	2.91	577,273	1.856	10	344,763	7	132,683	12
Virginia	7,078,515	2.52	570,279	1.833	11	269,121	11	157,176	9
Michigan	9,938,444	3.53	523,589	1.683	12	235,269	13	91,415	14
Maryland	5,296,486	1.88	518,315	1.666	13	228,429	14	144,381	11
Pennsylvania	12,281,054	4.36	508,291	1.634	14	209,123	15	112,171	13
North Carolina	8,049,313	2.86	430,000	1.382	15	268,357	12	86,441	16
Connecticut	3,405,565	1.21	369,967	1.189	16	144,271	18	81,853	17
Colorado	4,301,261	1.53	369,903	1.189	17	201,072	16	79,299	18
Ohio	11,353,140	4.03	339,279	1.091	18	143,035	19	58,057	21
Nevada	1,998,257	0.71	316,593	1.018	19	139,294	21	90,288	15
Oregon	3,421,399	1.22	289,702	0.931	20	144,801	17	69,715	19
Minnesota	4,919,479	1.75	260,463	0.837	21	141,968	20	63,689	20
Hawaii	1,211,537	0.43	212,229	0.682	22	72,394	28	56,576	22
Wisconsin	5,363,675	1.91	193,751	0.623	23	90,728	24	40,824	23
Indiana	6,080,485	2.16	186,534	0.600	24	97,460	22	33,235	26
Tennessee	5,689,283	2.02	159,004	0.511	25	91,804	23	32,164	27
Utah	2,233,169	0.79	158,664	0.510	26	90,725	25	33,770	25
Missouri	5,595,211	1.99	151,196	0.486	27	79,223	26	27,435	32

State	Total Population	Total Population Share (%)	Foreign-born Population						
			Population	Share (%)	Rank	Entered 1990 ~ 2000	Rank	Entered 1980 ~ 1989	Rank
New Mexico	1,819,046	0.65	149,606	0.481	28	58,482	31	39,365	24
Kansas	2,688,418	0.96	134,735	0.433	29	74,260	27	31,228	29
Oklahoma	3,450,654	1.23	131,747	0.424	30	69,879	29	29,287	30
Rhode Island	1,048,319	0.37	119,277	0.383	31	41,478	37	31,928	28
South Carolina	4,012,012	1.43	115,978	0.373	32	60,807	30	21,739	33
Louisiana	4,468,976	1.59	115,885	0.373	33	42,849	36	29,075	31
Iowa	2,926,324	1.04	91,085	0.293	34	52,335	32	19,265	34
Alabama	4,447,100	1.58	87,772	0.282	35	46,520	34	17,460	36
Kentucky	4,041,769	1.44	80,271	0.258	36	47,225	33	13,321	40
Nebraska	1,711,263	0.61	74,638	0.240	37	43,162	35	16,399	38
Arkansas	2,673,400	0.95	73,690	0.237	38	40,741	38	16,916	37
Washington DC	572,059	0.20	73,561	0.236	39	37,533	39	18,712	35
Idaho	1,293,953	0.46	64,080	0.206	40	30,570	40	15,286	39
New Hampshire	1,235,786	0.44	54,154	0.174	41	20,191	42	9,102	43
Delaware	783,600	0.28	44,898	0.144	42	21,187	41	9,579	42
Mississippi	2,844,658	1.01	39,908	0.128	43	19,781	43	8,091	44
Alaska	626,932	0.22	37,170	0.119	44	14,753	44	10,379	41
Maine	1,274,923	0.45	36,691	0.118	45	10,383	45	5,543	45
Vermont	608,827	0.22	23,245	0.075	46	8,217	46	3,432	47
West Virginia	1,808,344	0.64	19,390	0.062	47	6,916	48	3,434	46
Montana	902,195	0.32	16,396	0.053	48	4,751	50	2,870	48
South Dakota	754,844	0.27	13,495	0.043	49	7,427	47	2,331	50
North Dakota	642,200	0.23	12,114	0.039	50	6,339	49	1,497	51
Wyoming	493,782	0.18	11,205	0.036	51	4,237	51	2,360	49

Source : U.S. Census Bureau, Census 2000 Summary File 3 (SF 3)

Notes: 1. This table is ranked by foreign-born population

2. Total population share for each state is calculated by (total population for each state/Total population in U.S.)x100.

3. Foreign-born population share for each state is calculated by (foreign-born population for each state/Total foreign-born population)x100.

Table 3: The Distribution of Hispanics by States, 2000

State	Hispanics				
	Total Hispanic Population	Foreign-Born		Foreign-Born, non-citizen	
		Population	Share (%)	Population	Share (%)
California	10,969,132	4,819,437	43.94	3,559,477	32.45
Texas	6,670,122	2,125,034	31.86	1,562,964	23.43
Florida	2,680,314	1,484,673	55.39	855,237	31.91
New York	2,865,016	1,149,982	40.14	771,469	26.93
Illinois	1,529,141	705,610	46.14	518,429	33.90
New Jersey	1,116,149	503,977	45.15	330,811	29.64
Arizona	1,295,317	462,469	35.70	363,046	28.03
Georgia	429,976	259,999	60.47	220,555	51.29
North Carolina	372,964	227,318	60.95	197,434	52.94
Colorado	735,099	201,072	27.35	164,936	22.44
Nevada	393,539	190,544	48.42	143,011	36.34
Virginia	327,273	170,727	52.17	130,238	39.79
Washington	439,841	169,206	38.47	131,424	29.88
Massachusetts	427,340	133,161	31.16	96,811	22.65
Oregon	273,938	126,366	46.13	105,617	38.56
Maryland	227,105	123,422	54.35	86,926	38.28
New Mexico	765,610	113,935	14.88	80,329	10.49
Utah	200,005	84,561	42.28	70,178	35.09
Michigan	322,160	79,467	24.67	59,663	18.52
Connecticut	318,947	73,959	23.19	51,172	16.04
Indiana	210,538	73,677	34.99	56,551	26.86
Kansas	186,299	71,312	38.28	55,869	29.99
Pennsylvania	392,121	68,487	17.47	45,267	11.54
Oklahoma	177,768	64,059	36.04	49,733	27.98
Wisconsin	191,049	63,262	33.11	49,573	25.95
Tennessee	119,425	59,098	49.49	48,663	40.75
Minnesota	141,786	57,573	40.61	46,102	32.52
South Carolina	92,828	45,501	49.02	37,766	40.68
Arkansas	85,576	42,120	49.22	35,127	41.05

State	Hispanics				
	Total Hispanic Population	Foreign-Born		Foreign-Born, non-citizen	
		Population	Share (%)	Population	Share (%)
Louisiana	107,854	40,799	37.83	21,602	20.03
Rhode Island	90,452	39,965	44.18	28,214	31.19
Nebraska	93,872	38,952	41.49	30,537	32.53
Ohio	213,889	38,447	17.98	25,312	11.83
Idaho	101,594	37,912	37.32	29,324	28.86
Missouri	116,373	35,967	30.91	27,081	23.27
Iowa	81,501	31,864	39.10	25,330	31.08
Alabama	72,627	31,844	43.85	25,442	35.03
Washington D.C.	45,015	28,918	64.24	22,430	49.83
Kentucky	56,414	23,550	41.74	19,131	33.91
Delaware	37,321	13,256	35.52	10,504	28.15
Mississippi	37,790	13,176	34.87	10,400	27.52
Hawaii	87,582	7,533	8.60	3,204	3.66
Alaska	25,765	5,889	22.86	3,008	11.67
New Hampshire	19,910	5,767	28.97	3,595	18.06
Wyoming	31,384	4,432	14.12	3,218	10.25
South Dakota	10,386	2,339	22.52	1,638	15.77
West Virginia	11,774	1,996	16.95	1,182	10.04
Montana	18,490	1,569	8.49	923	4.99
Maine	9,226	1,532	16.61	748	8.11
North Dakota	7,568	1,147	15.16	568	7.51
Vermont	5,316	955	17.96	316	5.94

Source: U.S. Census Bureau, Census 2000 Summary File 3 (SF 3)

Notes:1. This table ranked by foreign-born population
2. Hispanic foreign-born population share is calculated by (Hispanic foreign-born population/Total Hispanic population)x100.
3. Hispanic foreign-born non-citizen population share is calculated by (Hispanic foreign-born non-citizen population/Total Hispanic population)x100

Table 4: Employment Outcomes by Demographic Group: Base Model

Dependent Variable: Employment Ratio

	Whites, Non-Hispanic	Blacks, Non-Hispanic	Hispanics	Immigrants
Spatial Mismatch Index	-0.05	-0.30***	-0.46***	-0.15***
	(0.10)	(0.05)	(0.11)	(0.04)
Commute Time	-0.62*	0.69***	-0.04	_____
	(0.92)	(0.13)	(0.17)	
Car availability				
% with at least one car	3.93***	0.42***	0.39***	-0.17
	(0.96)	(0.07)	(0.11)	(0.16)
Size control				
Total Population (in 100,000)	-0.10**	-0.01	0.03	0.14**
	(0.04)	(0.02)	(0.026)	(0.03)
Location control				
Gateway	-10.37**	-4.55***	5.35***	6.10***
	(2.07)	(0.81)	(1.54)	(1.05)
Personal controls	Yes	Yes	Yes	No
% of Male Workers	-8.02***	-0.42***	-1.12***	____
	(1.26)	(0.05)	(0.22)	
Median Age	-1.35***	-0.38***	1.06***	____
	(0.32)	(0.13)	(0.38)	
Education Level				
% of High School Dropout	0.21**	0.19***	0.33***	____
	(0.10)	(0.04)	(0.05)	
% of High School Diploma or Higher	0.65***	0.007	0.06	____
	(0.21)	(0.06)	(0.10)	
Constant	894.7***	2.55	15.62	29.70*
	(119.37)	(8.72)	(16.85)	(16.20)
N	276	276	276	276
R^2	0.47	0.54	0.48	0.39

Note: robust standard errors are in parentheses. * indicates significant at 10% level, ** at 5% level, *** at 1% level.

Table 5: Employment Outcomes for Blacks and Whites, Augmented Model Controlling for Residence Ratio of Immigrants and Hispanics

Dependent Variable: Employment Ratio

	Whites, Non-Hispanic	Blacks, Non-Hispanic	Whites, Non-Hispanic	Blacks, Non-Hispanic
Spatial Mismatch	-0.05	-0.31***	-0.001	-0.30***
Index	(0.08)	(0.05)	(0.06)	(0.05)
Residence Ratio of	-1.30***	-0.17***		
Immigrants	(0.14)	(0.07)		
Residence Ratio of			-0.83***	-0.07*
Hispanics			(0.06)	(0.04)
Commute Time	-0.78**	0.77***	-1.64***	0.70***
	(0.28)	(0.13)	(0.20)	(0.13)
Car availability				
% with at least one car	3.99***	0.47***	2.38**	0.45***
	(0.99)	(0.07)	(1.06)	(0.07)
Size control				
Total Population	0.06	0.008	-0.01	-0.009
(in 100,000)	(0.05)	(0.02)	(0.004)	(0.02)
Location control				
Gateway	-3.16**	-3.32***	-1.47*	-3.58***
	(1.51)	(0.83)	(0.87)	(0.84)
Personal controls	Yes	Yes	Yes	Yes
% of Male Workers	-4.24***	-0.39***	-3.89***	-0.40***
	(0.96)	(0.05)	(1.35)	(0.05)
Median Age	-0.43*	-0.35***	-0.15	-0.30**
	(0.25)	(0.13)	(0.20)	(0.13)
Education Level				
% of High School Dropout	-0.08	0.17***	-0.04	0.17***
	(0.10)	(0.04)	(0.08)	(0.04)
% of High School Diploma or Higher	0.33**	-0.005	0.10	-0.01
	(0.15)	(0.06)	(0.11)	(0.06)
Constant	711.04***	-3.35	548.14***	-2.11
	(101.17)	(8.65)	(82.67)	(8.70)
N	276	276	276	276
R^2	0.64	0.55	0.77	0.55

Note: robust standard errors are in parentheses. * indicates significant at 10% level, ** at 5% level, *** at 1% level.

Table 6: Employment Outcomes for Hispanics and Immigrants, Augmented Model Controlling for Residence Ratio of Whites and Blacks

Dependent Variable: Employment Ratio

	Hispanics	Immigrants	Hispanics	Immigrants
Spatial Mismatch Index	-0.16***	-0.08**	-0.46***	-0.14***
	(0.06)	(0.03)	(0.11)	(0.04)
Residence Ratio of Whites	-0.56***	-0.27***		
	(0.07)	(0.03)		
Residence Ratio of Blacks			-0.15***	-0.07***
			(0.05)	(0.03)
Commute Time	-0.69***	____	0.11	____
	(0.18)		(0.17)	
Car availability				
% with at least one car	0.11	-0.25**	0.40***	-0.13
	(0.11)	(0.11)	(0.11)	(0.16)
Size control				
Total Population (in 100,000)	-0.005	0.09***	0.025	0.14***
	(0.02)	(0.02)	(0.026)	(0.03)
Location control				
Gateway	3.15***	3.45***	5.05*	5.99***
	(1.03)	(0.68)	(1.52)	(1.04)
Personal controls	Yes	No	Yes	No
% of Male Workers	-0.80***	____	-1.03***	____
	(0.13)		(0.21)	
Median Age	0.61**	____	1.10***	____
	(0.26)		(0.38)	
Education Level				
% of High School Dropout	0.16***	____	0.32***	____
	(0.04)		(0.05)	
% of High School Diploma or Higher	-0.10	____	0.08	____
	(0.08)		(0.10)	
Constant	90.24***	56.23***	7.38	26.26*
	(16.41)	(10.78)	(16.77)	(15.90)
N	276	276	276	276
R^2	0.75	0.66	0.49	0.40

Note: robust standard errors are in parentheses. * indicates significant at 10% level, ** at 5% level, *** at 1% level.

Table 7: Employment Outcomes by Demographic Group: Base Model and Centers

Dependent Variable: Employment Ratio

	Whites, Non-Hispanic	Blacks, Non-Hispanic	Hispanics	Immigrants
Spatial Mismatch	-0.06	-0.30***	-0.46***	-0.14***
Index	(0.10)	(0.05)	(0.11)	(0.04)
Commute Time	-0.77**	0.70***	-0.04	_____
	(0.31)	(0.12)	(0.16)	
Car availability				
% with at least one car	3.45***	0.42***	0.39***	-0.29*
	(0.94)	(0.07)	(0.10)	(0.15)
Location control				
Gateway	-10.41***	-4.52***	5.32***	6.12***
	(2.08)	(0.81)	(1.54)	(1.08)
Number of	-0.31***	-0.07	0.14	0.56***
Employment Centers	(0.14)	(0.16)	(0.10)	(0.09)
Personal controls	Yes	Yes	Yes	No
% of Male Workers	-7.94***	-0.42***	-1.12***	____
	(1.24)	(0.06)	(0.21)	
Median Age	-1.35***	-0.38***	1.07***	____
	(0.32)	(0.13)	(0.38)	
Education Level				
% of High School	0.23**	0.19***	0.33***	____
Dropout	(0.10)	(0.04)	(0.05)	
% of High School	0.65***	0.007	0.06	____
Diploma or	(0.22)	(0.06)	(0.10)	
Higher				
Constant	846.72***	2.45	15.76	40.84***
	(119.24)	(8.73)	(16.68)	(14.84)
N	276	276	276	276
R^2	0.46	0.54	0.48	0.38

Note: robust standard errors are in parentheses. * indicates significant at 10% level, ** at 5% level, *** at 1% level.

Table 8: Employment Outcomes for Blacks and Whites, Augmented Model and Centers Controlling for Residence Ratio of Immigrants and Hispanics

Dependent Variable: Employment Ratio

	Whites, Non-Hispanic	Blacks, Non-Hispanic	Whites, Non-Hispanic	Blacks, Non-Hispanic
Spatial Mismatch	-0.05	-0.30***	-0.003	-0.30***
Index	(0.08)	(0.05)	(0.06)	(0.05)
Residence Ratio of	-1.30***	-0.17**		
Immigrants	(0.14)	(0.07)		
Residence Ratio of			-0.83***	-0.07*
Hispanics			(0.06)	(0.04)
Commute Time	-0.75***	0.79***	-1.67***	0.71***
	(0.25)	(0.12)	(0.17)	(0.11)
Car availability				
% with at least one car	4.12***	0.46***	2.29**	0.44***
	(1.02)	(0.07)	(0.98)	(0.07)
Location control				
Gateway	-3.19**	-3.32***	-1.47*	-3.55***
	(1.51)	(0.82)	(0.87)	(0.84)
Number of	0.25	-0.005	-0.01	-0.06
Employment Centers	(0.16)	(0.09)	(0.13)	(0.08)
Personal controls	Yes	Yes	Yes	Yes
% of Male Workers	-4.28***	-0.39***	-3.87***	-0.40***
	(0.97)	(0.05)	(1.37)	(0.05)
Median Age	-0.43*	-0.34***	-0.15	-0.30**
	(0.25)	(0.13)	(0.20)	(0.13)
Education Level				
% of High School	-0.08	0.17***	-0.04	0.17***
Dropout	(0.10)	(0.04)	(0.08)	(0.04)
% of High School	0.33**	-0.005	0.10	-0.01
Diploma or	(0.15)	(0.06)	(0.11)	(0.06)
Higher				
Constant	724.80***	-3.24	538.63***	-2.22
	(105.47)	(8.71)	(82.83)	(8.71)
N	276	276	276	276
R^2	0.64	0.55	0.77	0.55

Note: robust standard errors are in parentheses. * indicates significant at 10% level, ** at 5% level, *** at 1% level.

Table 9: Employment Outcomes for Hispanics and Immigrants, Augmented Model and Centers Controlling for Residence Ratio of Whites and Blacks

Dependent Variable: Employment Ratio

	Hispanics	Immigrants	Hispanics	Immigrants
Spatial Mismatch	-0.17***	-0.08**	-0.46***	-0.14***
Index	(0.06)	(0.03)	(0.11)	(0.04)
Residence Ratio of	-0.56***	-0.27***		
Whites	(0.07)	(0.03)		
Residence Ratio of			-0.15***	-0.08***
Blacks			(0.05)	(0.02)
Commute Time	-0.71***	____	0.11	____
	(0.18)		(0.16)	
Car availability				
% with a t least one car	0.12	0.28**	0.39***	-0.14
	(0.11)	(0.11)	(0.10)	(0.16)
Location control				
Gateway	3.13***	3.45***	5.02***	5.99***
	(1.03)	(0.69)	(1.53)	(1.04)
Number of	0.008	0.15	0.12	-0.03
Employment Centers	(0.08)	(0.22)	(0.11)	(0.30)
Personal controls	Yes	No	Yes	No
% of Male Workers	-0.79***	____	-1.04***	____
	(0.13)		(0.20)	
Median Age	0.61**	____	1.10***	____
	(0.26)		(0.38)	
Education Level				
% of High School Dropout	0.16***	____	0.32***	____
	(0.04)		(0.05)	
% of High School Diploma or Higher	-0.10	____	0.08	____
	(0.08)		(0.10)	
Constant	89.67***	58.64***	7.61	27.44*
	(16.18)	(10.74)	(16.62)	(15.60)
N	276	276	276	276
R^2	0.75	0.67	0.49	0.41

Note: robust standard errors are in parentheses. * indicates significant at 10% level, ** at 5% level, *** at 1% level.

References

Brueckner, Jan K. and Yves Zenou. 2003. "Space and Unemployment: The Labor Market Effects of Spatial Mismatch," *Journal of Labor Economics*, 21, 242-266.

Brueckner, Jan K. and Richard W. Martin. 1997. "Spatial Mismatch: An Equilibrium Analysis," *Regional Science and Urban Economics*, 27, 693-714.

Card, David. 2001. "Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration," *Journal of Labor Economics*, 19, 22-64.

Gobillon, Laurent, Harris Selod and Yves Zenou. 2007. "The Mechanisms of Spatial Mismatch", Urban Studies, 44(12), 2401-2427.

Ihlanfeldt, Keith R., and David L. Sjoquist. 1990. "Job Accessibility and Racial Differences in Youth Employment Rates," *American Economic Review*, 80, 267-276.

Ihlanfeldt, Keith R. and David L. Sjoquist. 1998. "The Spatial Mismatch Hypothesis: A Review of Recent Studies and Their Implications for Welfare Reform," *Housing Policy Debate*, 9, 849-892.

Kain, John F. 1968. "Housing Segregation, Negro Employment, and Metropolitan Decentralization," *The Quarterly Journal of Economics*, 82, 75-97.

Kain, John F. 1992. "The Spatial Mismatch Hypothesis: Three Decades Later," *Housing Policy Debate*, 3, 371-460.

Martin, Richard W. 2001. "The Adjustment of Black Residents to Metropolitan Employment Shifts: How Persistent is Spatial Mismatch?" *Journal of Urban Economics*, 50, 52-76.

Martin, Richard W., (2004), "Spatial Mismatch and the Structure of American Metropolitan Areas, 1970-2000," *Journal of Regional Science*, 44, 467-488.

McMillen, Daniel P. and Stefani C. Smith, "The Number of Subcenters in Large Urban Areas," Journal of Urban Economics, 53, 321-338.

Stoll, Michael A, Harry J. Holzer, and Keith R. Ihlanfeldt. 2000. "Within Cities and Suburbs: Racial Residential Concentration and the Spatial Distribution of Employment Opportunities across Sub-metropolitan Areas," *Journal of Policy Analysis and Management*, 19, 207-231.

Stoll, Michael A. and Steven Raphael, (2000), "Racial Differences in Spatial Job Search Patterns: Exploring the Causes and Consequences," *Economic Geography*, 76, 201-223.

U.S. Department of Transportation. 2000. *Census Transportation Planning Package*. Available at http://www.fhwa.dot.gov/ctpp/dataprod.htm