

# Reassessing the Spatial Mismatch Hypothesis<sup>†</sup>

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The spatial mismatch (SM) hypothesis is that the combination of residential segregation and an uneven distribution of jobs limits the employment opportunities of Black workers (Kain 1968; Ellwood 1986; Wilson 1987). We evaluate this hypothesis in the 2010s using data from the Longitudinal Employer-Household Dynamics (LEHD) program at the US Census, which has detailed residential and workplace locations for nearly all US workers. We also introduce a new measure of job quality to the SM literature: the establishment earnings premium, estimated from an earnings decomposition from Abowd, Kramarz, and Margolies (1999)—henceforth, AKM.

We focus on two groups of cities: (i) older industrial cities in the Northeast and Midwest and (ii) newer Sunbelt cities in the South and Southwest.<sup>1</sup> We use an AKM model to decompose the Black-White earnings gap in these cities into components attributable to permanent worker effects and to pay premiums of employers. Our first key finding is that virtually *none* of the Black-White gap reflects differences in average establishment pay premiums. This surprising result is the opposite of what we would expect if distance to high-paying jobs was a major driver of the gap.

Next, we examine the geographic distribution of workers and jobs. We show that Black workers' homes are, if anything, closer to potential workplaces in their city and to workplaces with high earnings premiums than are White workers' homes.

Ellwood (1986) argues that in an equilibrium model with mismatch, Blacks will have longer commute distances than Whites. Our third key finding is that Black workers' average commutes are *shorter* than those of White workers. Among both Blacks and Whites, longer commutes are associated with higher-paying jobs (i.e., jobs at establishments with higher AKM pay premiums), as one might expect if workers trade off pay and commuting distance. However, this association is no stronger for Black workers, as would be expected if SM limited Black workers' access to high-paying jobs. Last, in the older industrial cities, jobs near Black neighborhoods offer *higher* average pay premiums than do jobs near White neighborhoods. The relationship is weaker, though still positive, in the Sunbelt cities.

Overall, we find no evidence that SM is a primary contributor to Black-White earnings gaps in the 2010s. We close by suggesting some directions for further research on the microgeography of employment and earnings.

## I. The Spatial Mismatch Hypothesis

The idea of spatial mismatch originated in a 1965 paper by John Kain and was expounded in Kain (1968). A subsequent literature—reviewed in the online Appendix—has found decidedly mixed evidence regarding the SM hypothesis. A secondary concern in the literature (e.g., Ellwood 1986) is that the theoretical underpinnings of SM are weak. In the online Appendix, we sketch a partial equilibrium model of worker choice over jobs in some potential “opportunity set” that includes jobs with different pay premiums at different commute distances. In that framework, it is useful to characterize the relative

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<sup>†</sup> Go to <https://doi.org/10.1257/pandp.20241112> to visit the article page for additional materials and author disclosure statement(s).

<sup>1</sup> The older industrial cities in our analysis are Philadelphia, Detroit, Pittsburgh, Cleveland, Newark, Buffalo, Baltimore, Chicago, Minneapolis, and St. Louis. The newer Sunbelt cities are Los Angeles, Houston, Atlanta, Miami, Dallas, San Diego, and Phoenix.

number of higher- and lower-premium jobs in a city that are within a given commute distance of a typical Black or White worker. We also discuss how comparisons between the regression coefficients for Blacks and Whites relating AKM pay premiums to commuting distances can be interpreted as evidence of differences in their average opportunity sets. Our framework takes worker and job locations as given and is only a first step in incorporating AKM-style wage-setting features in a spatial model.

## II. Data

Much of the existing evidence on SM has utilized data from only a few cities with historically high rates of residential segregation—for example, Chicago (in the case of Ellwood 1986), Detroit, or both (in the case of Kain 1968). In an effort to expand the evidence, we present results for two groupings of larger commuting zones (CZs). One group consists of ten older CZs in the Northeast and Midwest. These have a traditional urban structure, with Black neighborhoods concentrated near the city center and largely White suburbs and exurbs. The second group is seven CZs in the South and Southwest that emerged as major centers later in the twentieth century and tend to have a less monocentric structure. Characteristics of these two sets of CZs and two other groupings of cities that make up the balance of the 30 largest CZs in the country are presented in the online Appendix.

To study mismatch in these CZs, we use quarterly earnings data from the first quarter of 2010 to the second quarter of 2018 from the LEHD linked to detailed residential and workplace location information. In this period, the LEHD covers about 95 percent of private sector employment as well as state and local government employees. We limit attention to non-Hispanic Black and White workers who are likely full-quarter, full-time workers with a single employer in the quarter. (See the online Appendix for details.)

We measure commute distance as the distance between a worker's residential location and that of the establishment where he or she works. Because CZs vary so much in their scales and commute distance distributions, in many of our analyses we rescale distances to set the seventy-fifth percentile commute in each CZ to equal 16 miles.

In most states, the assignment of workers to establishments in multi-establishment firms is probabilistically imputed using information on the worker's residence and the locations of the firm's establishments. We rely on these imputations and note below one case in which results appear sensitive to them.

Changes in residential patterns since the 1960s may have reduced SM. Unfortunately, data like ours do not exist for earlier periods.

## III. Decomposition of the Black-White Earnings Gap

A core part of the mismatch hypothesis is that Black workers have access to worse jobs than do similarly skilled White workers by virtue of their residential locations. Thus, we might expect that employed Black workers work at worse firms than do employed White workers.

We begin with a simple AKM decomposition of log quarterly earnings ( $y_{it}$ , for person  $i$  in quarter  $t$ ) into components representing permanent person effects,  $\alpha_i$ , common effects for the establishment  $f(i,t)$  at which the worker is employed,  $\delta_{f(i,t)}$ , a few time-varying controls ( $X_{it}$ , calendar time dummies, and a cubic in age), and a residual,  $\epsilon_{it}$ ,

$$(1) \quad y_{it} = \alpha_i + \delta_{f(i,t)} + X_{it}\beta + \epsilon_{it}.$$

We estimate this separately for each CZ, normalizing the restaurant industry to have zero average pay premium. We then average the estimates from (1) by CZ and race to decompose the White-Black log earnings gap in CZ  $c$  into parts reflecting mean difference by race in the person effects, the establishment effects, and the covariates,

$$(2) \quad \bar{y}_{cw} - \bar{y}_{cb} = (\bar{\alpha}_{cw} - \bar{\alpha}_{cb}) + (\bar{\delta}_{cw} - \bar{\delta}_{cb}) + (\bar{X}_{cw} - \bar{X}_{cb})\beta.$$

The third term is negligible, so this yields a two-part decomposition.

Table 1 presents this decomposition averaged across CZs in each grouping. In both sets of CZs, the quarterly White-Black earnings gap is about 35 log points—similar to the pay gaps for full-year earners in the American Community Survey (ACS) (see the online Appendix). The AKM decomposition attributes virtually all of

TABLE 1—AKM DECOMPOSITION OF BLACK-WHITE QUARTERLY EARNINGS GAP

	Older industrial CZs	Newer Sunbelt CZs
Geometric mean earnings (quarterly, nominal dollars)		
White	14,271	15,835
Black	10,067	10,993
log earnings gap	0.35	0.36
Share of gap attributable to (%)		
Person effects	105.1	104.1
Establishment effects	−0.8	1.2

Notes: Author calculations from LEHD data. Sample excludes person-quarters with multiple employers or earnings below \$3,800, as well as the first and last quarter of each spell. AKM model is fit separately for each CZ, with the average establishment effect in the restaurant industry normalized to zero. Results are then pooled across CZs in each group. Geometric mean earnings are the exponentiation of mean log earnings across person-quarters in the AKM sample.

this to differences in the person effects. While differences in workplace pay premiums account for over 10 percent of the variation in wages across workers, there is no appreciable difference in the mean pay premiums received by Blacks versus Whites. This is an initial indication that access to high-paying establishments is not a primary determinant of the Black-White earnings gap.<sup>2</sup>

The absence of a racial gap in pay premiums is potentially surprising given the tendency for assortative matching between high-skilled workers and high-premium workplaces, and the fact that Black workers are estimated to have around 35 percent lower person effects than Whites. It is potentially consistent, however, with long-standing evidence that Blacks are more likely to work in unionized jobs (see the online Appendix for further discussion).

IV. Geographic Distribution of Workers and Jobs

Figure 1 begins our analysis of the location of jobs relative to workers. For each worker and for varying radii  $r$ , we compute the share of all

<sup>2</sup>This does not rule out that employers as a whole are discriminating against Black workers either in employment or wage setting. Insofar as this discrimination is similar across firms, this could appear as reduced person effects for Black workers rather than in the  $\delta$  term.

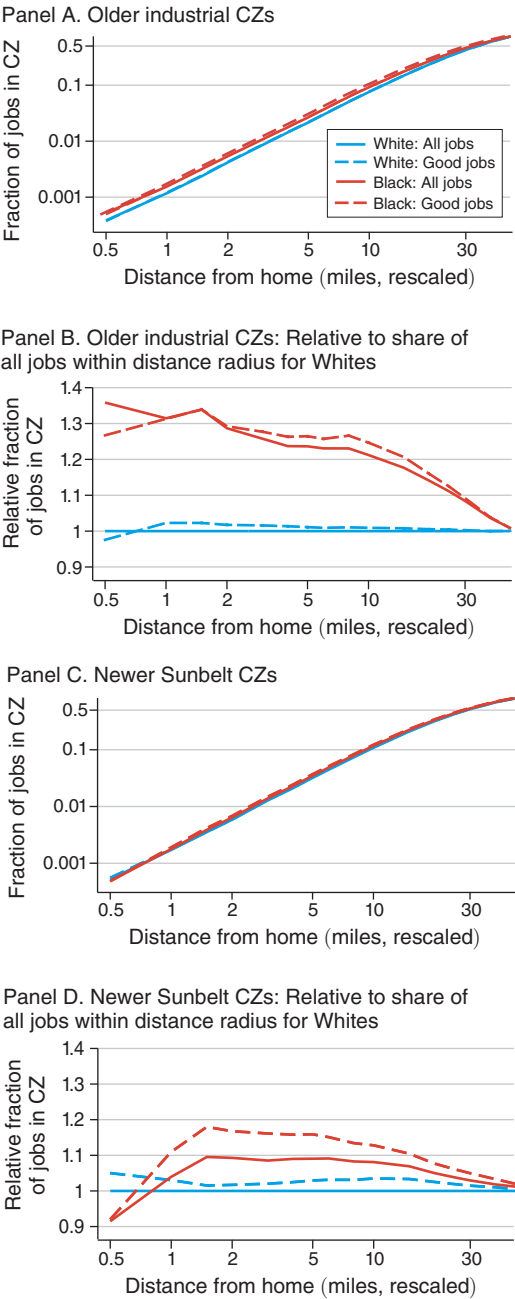


FIGURE 1. FRACTION OF ALL JOBS AND JOBS AT GOOD ESTABLISHMENTS WITHIN COMMUTING DISTANCE OF AVERAGE BLACK AND WHITE WORKER

Notes: Distances for each CZ are rescaled to set the seventy-fifth percentile commute distance to 16 miles. “Good jobs” are those at establishments with AKM establishment effects in the top tercile.

jobs in the CZ that are located within radius  $r$ . We average this across Black and White workers separately in each CZ, then average across CZs in our two groupings.

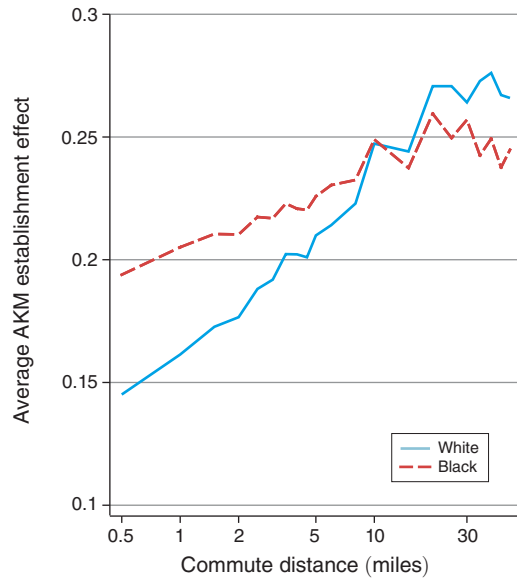
The figure shows that for every  $r$ , there are more jobs within  $r$  miles of the typical Black worker than of the typical White worker in the older industrial CZs. The same is true for the newer Sunbelt CZs for any  $r > 1$ . Moreover, the jobs near Black workers are of no lower quality (as measured by the establishment premium) than those near White workers. Dashed lines show the share of jobs at establishments with  $\delta_f$  in the top tercile within radius  $r$ ; these tell a similar story as the all-jobs series. There is no indication that there is a systematic shortage of jobs, or of good jobs, within a reasonable commuting distance of Black workers. The online Appendix presents an analysis that distinguishes jobs held by college and noncollege workers; this does not affect the result.

Another way to measure access to good jobs is via the correlation between the fraction of residents at a location who are Black and the average premium of all establishments within a short commuting range of that location. We assign workers to locations defined by a 0.5-mile-by-0.5-mile grid and measure the average  $\delta_f$  of all establishments within 2.5 miles of each location. The correlation of this measure of nearby job quality with location fraction Black is 0.26 for the older industrial CZs and 0.10 for the newer sunbelt CZs—if anything, jobs near Black neighborhoods are *better* than those near White neighborhoods.

Ellwood (1986) proposes what we would now call an “outcomes test” for spatial mismatch: if Black workers have less access to nearby jobs, we should see longer commutes for this population in equilibrium. In the older industrial CZs, the mean Black worker commutes only 86 percent as far as the mean White worker, and the White commute distribution stochastically dominates that of Blacks. In the newer Sunbelt CZs, mean White and Black commute distances are about the same (see online Appendix Figure A-2 and Table A-3).

Figure 2 shows how job quality relates to commute distance. In both groups of cities and for both races, longer commutes are associated with better establishment quality ( $\delta_f$ ), as would be expected if workers trade off wages against commute time in their job search. In the older

Panel A. Older industrial CZs



Panel B. Newer Sunbelt CZs

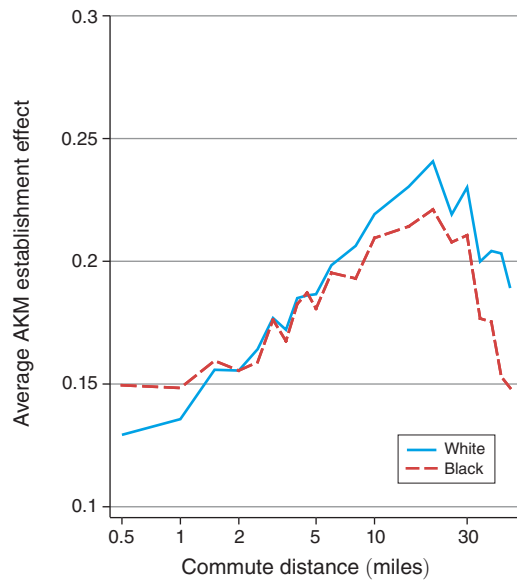


FIGURE 2. AKM ESTABLISHMENT EFFECT AND COMMUTE DISTANCE, BY CZ GROUP AND RACE

*Note:* Distances for each CZ are rescaled to set the seventy-fifth percentile commute distance to 16 miles.

industrial CZs, Black workers with commute distances of up to 10 miles commute to better (higher  $\delta_f$ ) establishments than do White

workers with similar commutes, while in the newer Sunbelt CZs, establishment quality conditional on commute distance is similar for the two races. In both sets of CZs, among workers with the longest commutes, Black workers commute to worse establishments. This implies that the establishment quality–commute distance trade-off is less steep for Black workers, the opposite of what we would expect under spatial mismatch.

One notable aspect of Figure 2 is that while job quality is generally increasing in commute distance, the pattern reverses for commutes longer than about 20 miles. Online Appendix Figure A-3 presents an analysis of this relationship that distinguishes by firm size and number of establishments. The downward slope is driven by workers at multi-establishment firms. We suspect that this is an artifact of the algorithm for imputing a worker's establishment, which is based on establishment locations but not on their relative wage effects. Figure 2 suggests that workers may be particularly unlikely to commute past a nearby establishment to work at another one with a lower wage premium. If so, this would create bias for long commutes at multi-establishment firms. The upward slope through most of the distribution in Figure 2 appears to be robust to this, however, as it holds even for workers at single-establishment firms.

As a final exercise, we estimate the elasticity of earnings with respect to commuting distance, as well as elasticities of the individual and establishment AKM wage components. Again, spatial mismatch should imply a steeper gradient of earnings with respect to commute distance for Black workers, driven by the establishment wage component. As shown in the online Appendix, we see no evidence of this in the LEHD or (using commute time) the ACS.

## V. Discussion

Our findings suggest that geographic proximity to “good” jobs—as measured by the AKM pay premiums offered at different workplaces—is not a major source of racial wage gaps in large cities in the United States today (though it may have been in the 1960s). More research is needed to understand whether the negligible difference in average pay premiums received by Black and White workers masks differences for particular employers or sectors. In ongoing work, we are also investigating differences between males and females and between Hispanic and non-Hispanic workers. Finally, it is important to note that our analysis focuses on racial gaps conditional on working full time: whether spatial mismatch has more relevance for other margins (such as employment versus nonemployment) is clearly an important remaining question.

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