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Chutes and Ladders: Migration and Male Racial Occupational Segregation

Nancy E. White and Amy M. Wolaver
Bucknell University - USA

Abstract. We examine the relationship between migration and occupational segregation for black and white job changers. Using a modified experience good model, our findings from the NLSY suggest that black migrants in good quality occupation matches advance their occupational positions, but do not catch up to whites. Bad match black migrants, on the other hand, lose the most ground on occupational ladders relative to all blacks and whites in our sample. Our results suggest that future research should focus on the underlying labor market history of individuals, where finding good initial occupation matches for blacks in combination with geographical mobility may be the most effective strategy for public policy aimed at decreasing occupational segregation.

1. Introduction

Previous studies reveal that African Americans, on average, are relatively less geographically mobile than whites and are occupationally segregated; that is, African Americans tend to sort into different, often lower paying and lower skilled occupations than whites. While migration specialists have studied the impact of race on black-white earnings differentials, the underlying interactions between migration and occupation match quality and their roles in sustaining racial occupational segregation are unknown.

This paper provides a descriptive approach to racial occupational segregation and movements along occupation ladders by including information from workers' labor market histories and migration. The data are longitudinal and the sample consists of male workers who change jobs. The formal exposition of the theoretical model underlying this paper is from White and Wolaver (2003). The model is a spatial extension of a well-known experience good model, where workers gather information about their productivity in an occupation (match quality). As workers gain this information, they may change occupations and locations. White and Wolaver tested their theoretical model using work history panel data along with personal and locational variables. Occupation change was included as an endogenous determinant of migration in recursive bivariate probit models, where workers were disaggregated by match quality in an occupation and by race. These authors concluded that migration and occupation change are linked, but that blacks and whites, as well as good and bad match workers, follow different migration processes.

In the present paper, we examine the effects of migration and occupation change by match quality and race on racial occupational segregation. Occupational segregation is generally characterized by blacks sorting disproportionately into lower ranked occupations. Our study analyzes the racial sorting process by match quality and migration and examines how occupational segregation changes throughout the career cycle of workers. We are particularly interested in determining whether segregation differs by migration and occupation match and if so, how it changes. The analysis focuses on the question of whether blacks make gains relative to whites in their occupational positions, which is followed by the question of how these gains are achieved. We introduce occupation ladders because changes in occupation up or down the ladder are likely to follow processes that vary by migration, match quality, and race. For example, racial occupational desegregation could occur from blacks

climbing up the ladder more quickly than whites or from whites descending down the ladder while blacks maintain their positions.

Our results suggest that good match black migrants make the greatest gains on the occupational ladders while bad match black migrants fall below all other groups. This finding implies that improving spatial mobility cannot be exclusively relied on to improve black males' positions on occupation ladders as a means by which occupational segregation may be decreased.

2. Literature Review

Researchers have recently studied the relationship between race and migration by emphasizing the influence of migration on racial earnings differentials. Krieg (1990) suggests that nonwhite interstate migration reduces earnings differentials. Raphael and Riker (1999) found, ceteris paribus, that some of the unexplained variation in the wages of women and minorities can be attributed to differences in mobility because immobile workers confront more limited labor market opportunities and tend to accept lower wage offers.

Racial differences may foster different decision frameworks for spatial mobility. Black workers may face different search costs because of occupational and housing segregation and different job arrival rates and wages because of labor market discrimination. Blacks may differ in observable characteristics such as higher propensities toward "linked" migration (Lee and Roseman 1997), stronger kinship ties (Johnson and Roseman 1990), methods of acquiring employment information (Cohn and Fossett, 1996), and poorer quality of spatial job search (Stoll and Raphael, 2000; O'Regan, 1993; Ross, 1998).

The interplay of race along with both the occupation and location decisions is not well understood. In a study by Lee and Roseman (1997), black interstate migration is found to increase with education, occupation status, and prior migration experience. Therefore, if race limits spatial job search, race has the potential to influence the ability to move up the occupation ladder and ultimately sustain or worsen racial occupational segregation. For minorities, migration may not "offer an opportunity to renew investments in human capital (industry and occupation specific) and increase growth rate of income", as concluded by Shaw (1991). Long (1973) suggests that the most productive workers may move up an occupation ladder by changing occupation and by moving; however, low productivity migrants who switch occupations may be worse off if location and occupation specific human capital are lost. When productivity (occupation match quality) is taken into consideration along with race, migration does not systematically improve on racial occupational segregation. In fact, for some groups, migration may worsen occupational segregation.

The experience good model, first proposed by Jovanovic (1979), provides a simple model of match quality and generates predictions about job mobility (employer change). Workers have different, initially unknown productivities at different job matches. Individuals must actually work in a job for some period of time before the quality of the job match is known. Before the worker's quality in a match is known, workers receive a wage that is equal to the expected productivity of workers in the population at that job. As firms and individuals receive information on job match quality, wages adjust downward for a poor quality signal and upward for a good quality signal. In White and Wolaver (2003), information is received about a worker's match quality in a particular *occupation*. For example, a janitor, who might be described as low skilled worker when compared with other occupations, with a good match signal in that (low skilled) job is a high productivity worker.[1]

The modified experience good model with occupation ladders and migration generates predictions that are different from the original aspatial Jovanovic model. The original model predicts that workers in good matches are unlikely to change; however, when we extend the model to include occupation ladders, a good productivity signal in one job might serve as a signal to both employers and workers that the worker is suitable for a different occupation higher up the occupation ladder.[2] These authors concluded that migration and occupation change are linked, but that blacks and whites, as well as good and bad match workers, follow different migration processes.

The relative occupational mobility of blacks and whites is examined in Waddoups et al. (1995) and in Wilson et al. (1999). Waddoups et al. find that occupational mobility differences are influenced by the spatial distribution of blacks and whites. These results show that occupation advancements occur more readily for blacks residing in metropolitan areas and that blacks are more likely to locate in metropolitan areas than whites. Therefore, location and occupation

[1] To minimize confusion in the exposition of this paper, high and low productivity workers within a particular occupation are described respectively as good match and bad match workers.

[2] See Jovanovic and Nyarko (1997) for a discussion that distinguishes between the matching hypothesis and human capital accumulation in a career ladder model. For a thorough discussion of our spatial modification to the experience good model, see White and Wolaver (2003).

change are linked, however, their research does not examine whether migration propensity is a factor in the occupational trajectory. Wilson et al. (1999), on the other hand, examine in detail the factors that influence the ability of blacks and whites to enter upper-tier occupations. They find that the promotion probabilities of blacks are much more likely than whites to rely on formal, easily observed credentials, concluding that blacks are more limited in their opportunities to "demonstrate relevant, informal criteria for promotion such as perceived loyalty, sound judgment, and leadership potential…" (p. 179)

If occupations are structured in a ladder arrangement, then changes in occupation up or down the ladder are likely to follow processes that vary by migration, match quality, and race. When occupation match quality is considered together with race, migration does not necessarily improve racial occupational segregation. In fact, for some groups, migration may worsen occupational segregation. The remainder of the paper is divided into the following sections. Section III presents the theory section and Section IV the data description. Our empirical findings are reported in Section V. Section VI contains a discussion and concluding remarks.

3. Theory

The underlying theoretical model is suggested by the empirical results of White and Wolaver (2003), where the occupation and location decisions of good and bad match workers and blacks and whites were found to respond differently to locational and labor market attributes. The findings were based on the Jovanovic model that is described above, where, over time, firms and individuals receive information on a worker's match quality, wages adjust according to the match quality signal, and workers with a bad signal about match quality terminate the match.

The Jovanovic model is aspatial and match quality is firm specific. Because the original Jovanovic model assumed firm specific match quality, match quality information did not extend to other occupations. White and Wolaver (2003) allowed signals about a worker's match quality in an *occupation* to carry over to other matches. Empirically, this meant that their occupation change variable was a proxy for the occupation signals that workers received and a determinant of migration. White and Wolaver found that match quality was a significant determinant of migration for workers in a bad occupation match, which was largely driven by the results from poorly matched whites. The migration decision of good match workers, on the other hand, was found to be unrelated to match quality information. One of the reasons that the match quality might have been statistically insignificant for good match workers is that some may be moving up an occupation ladder while others may be retaining their good occupation matches, which could obscure the information contained in the occupation change variable and cause the results to be statistically insignificant.

Their empirical findings suggest that for the white population, migration is selective of occupation match quality and that occupation ladders may play an important role in our understanding of migration and occupation choices by race and match quality. If there are differences in the relationship between occupation choice and migration by race and match quality, as suggested by White and Wolaver (2003), then the impact of these factors on racial occupational segregation should be examined in the context of movements along occupation ladders.

4. Data

Data on individuals are from the 1979 National Longitudinal Study of Youth (NLSY). We merge the Geocode files to the main NLSY files and the Work History files to create a panel data set for white and black male workers who changed employers between any pair of survey years from 1989/1990 to 1994/1996. These years are chosen for several reasons. First, respondents are between the ages of 25 and 32 years at the beginning of our sample period, which means that most have completed their education and are at their peak years of job shopping as described in Topel and Ward (1992). Second, to capture information on occupation match, we must have some prior work history information. Third, much of the previous research on labor market outcomes using these data was conducted on the first 11 years of the panel and focused on white males. Hypotheses generated from previous research may not be appropriate because of differences in the influence of race on ties to the labor market. Fourth, we focus on males because occupations exhibit gender segregation in addition to racial segregation, which further complicates the analysis.

Our sample consists only of employer (job) changers; that is, we exclude workers who are transferred or demoted/promoted within a firm match. When occupation changes occur without changing employers through promotion or demotion, it is likely that these data contain more noise than occupation changes accompanied by firm changes. Workers who are transferred to a different geographical location within the same firm are likely to be constrained in their choice of

potential locations in ways not associated with between-firm occupation changes.

We define a job change as the change in the CPS employer in the survey. The CPS employer is the current or most recent employer. The NLSY data contain job characteristics for the CPS job and up to 4 additional jobs during a survey time period. The respondent must have worked at least 10 hours per week at these additional jobs for the interviewer to collect job characteristic information for at least 9 weeks.

The occupation and location at each survey date are the values used to define occupation and location changes. We define migration as a change of Metropolitan Statistical Area (MSA). Individuals who changed counties within the MSA are not counted as migrants, to capture the idea of separate labor and housing markets. Migration is defined as an annual change (or survey date to survey date) of location as defined above. If a worker changed locations or changed jobs two or more times within a given year, we only count one of these changes. Therefore, some of the migration is repeat or return migration, but we do not exploit this additional information in our paper. Occupation change is defined as a change in the 2 digit Standard Occupational Code occupations listed in Table 1.

Table 1. Occupation Rungs

Occupation	Rungs = Average years of education	Percent of Sample in Occupation
1. Professional	17.22	11.79
2. Managerial	15.81	12.58
3. Technicians	15.28	5.27
4. Sales	14.47	12.26
5. Clerical	14.24	6.54
5. Protective Service	14.24	1.70
7. Mining	13.54	1.03
8. Mechanics	13.42	7.53
9. Construction	13.23	2.64
10. Transportation	13.03	6.34
11. Precision Production	12.98	2.12
12. Other Service	12.78	13.21
13. Machine Operators	12.47	8.20
14. Laborers	12.62	6.92
15. Farming, Forestry & Fishing	12.41	1.82
16. Private Household Service	11.71	0.04

Source: Authors' weighted calculations from Current Population Survey data, 1989-1994, 1996

In order to analyze occupational mobility, we must first construct an occupation ladder. Occupations are ranked empirically throughout the literature in a variety of ways. Economists generally prefer two approaches: ranking occupations by average wages in the sector (see Hall and Kasten, 1973, 1979), or by minimum education required (see Sicherman, 1991; and Robst, 1995). Sociologists tend to use either social status or other measures of skill complexity, sometimes using the Dictionary of Occupational Titles (DOT) (Wilson et al. 1999 is a recent example). Sicherman and Galor (1990), who use a weighted measure of human capital requirements in an occupation, discuss the rankings overlap across measures. They point out that measures relying on average wages in the occupation will be subject to error, because wages reflect both skill requirements and the returns associated with the amenities and disamenities of a particular occupation. We have chosen to use average years of education because it is easily calculated, available in the data, and less ad hoc than alternative measures.

Occupations are ordered by "rungs" on a ladder based on the average years of education of workers in that occupation from the 1989-1996 March Current Population Surveys (data computations available upon request from the authors). The rungs are arranged in Table 1 in descending order; that is, the oc-

cupation with the highest average years of education is the professional occupation, the lowest rung on the occupation ladder is household services. We refer to movements up and down the "ladder" by the number of rungs changed. For example, a change from the Professional to Technician occupation is a change of -1.94 rungs (15.28 – 17.22); a change from Construction to Mechanics is a +0.19 rung change (13.42-13.23).[3]

We remove military personnel from the sample, regardless of the respondents' current industry. We omit 287 employer changes where the previous employer was the military, since location changes made by military personnel are typically exogenous to the individual. We exclude 1519 individuals who had never changed employers. Workers with missing job information result in a reduction of 1805 job changes. We drop 1604 employer changes from the construction and agriculture industries, since these industries are characterized by temporary/seasonal work.[4] We also drop 3896 individuals whose pre- or post-job change locations were outside an MSA.[5] Hispanics (1115) are excluded from the sample, to simplify the analysis and because this paper follows White and Wolaver (2003), which focused on black and white racial differences. We also change to missing any real wages above $250 per hour (5 observations in previous job, 8 observations in new job). There are 187 observations with missing values in the either the previous job or current job real wage. We eliminate 600 employer changes because of missing information about the location. Finally, 2318 females are dropped, leaving a final sample of 2169 employer changes, some of which are multiple changes for the same individuals.[6]

Information about workers' occupation-specific match quality will likely generate different job choices. Some may move up a career ladder, while others may try to find an entry occupation on a different occupation ladder. Others may search for a better firm or industry match within the same occupation. The probability of a worker falling into any of these groups will depend largely on his match productivity. Good and bad occupation matches are identified by either a positive or negative occupation-specific wage premium. The occupation premium variable is defined as the percentage difference between the real wage earned by the individual and the adjusted occupation average wage, similar to the procedure used in Fallick (1993). The occupation average wage is adjusted for age, age squared, education, and gender by regressing real ($1996- based on CPI-U) hourly wages on age, age squared, education, and gender separately by occupation and year using Current Population Annual Demographic Survey data from 1989 to 1996. Age, after controlling for education, is a proxy for experience since the CPS does not contain data on actual experience. The occupation premium is not adjusted for race and location, which is the subject of future research.[7] The coefficients from these regressions (available from the authors upon request) are then used to predict the wage an individual should be earning, based on his personal and productivity characteristics, which is the adjusted occupation wage.

5. Empirical Findings

5.1 Occupational Segregation

If job changers are initially racially segregated into occupations and race is related to occupation change and migration, analysis of the pre-job change degree of occupational segregation is necessary for comparative purposes. Therefore, we first construct dissimilarity indices, which are used to demonstrate occupation segregation before and after a worker changes jobs. The indices of dissimilarity for the entire sample and for subgroups of the sample are summarized in Table 2. The indices were developed from the following expression:

[3] We conducted sensitivity analyses using alternative constructions of occupation ladders. Except where noted, the results were qualitatively similar to those presented here.

[4] These workers are dropped based on industry, not occupational status. They are dropped based on the propensity for seasonal work. Our sample includes workers in Construction (2.67% of the sample) and Farming Forestry & Fishing (1.61% of the sample) as shown in Table 1. These workers remain in our data if they are in non-seasonal industries.

[5] Recall that Waddoups et al. found that occupational mobility is influenced by the distribution blacks and whites across locations, with occupation advancements more likely for metropolitan blacks. Because we have excluded non-metro respondents from the sample, we expect that our results will be more favorable toward black occupational advancement.

[6] In the case of multiple job changes, a worker/job pair of characteristics could appear as the pre-job change characteristic in one observation and the post-job change characteristic in another job. For example, if a worker in our sample time frame is classified the Sales occupation at employer 1, in Sales at employer 2, and the Clerical occupation at employer 3 during our sample time frame, this individual appears as two observations in our data set. In the first observation, their pre-job change rung is 14.47, post-change is also 14.47, and the number of rungs moved is 0. In the second observation, the employer 2 to employer 3 job change, the pre-change rung is 14.47 and the post-change rung is 14.24, resulting in a movement of -0.23 rungs.

[7] Raphael and Riker (1999) offer a spatial argument for the differences in the occupation premium (discount) by race, which will likely be the subject of our subsequent work; that is, if blacks are relatively immobile and reside in locations with low employment growth, employers will infer this mobility difference and pay below average wages.

$$D = 1/2 \sum_{j=1}^{J} | P_{wj} - P_{bj} | ,$$

where D is the segregation index. The expressions P_{bj} and P_{wj} are the fraction of blacks and whites in occupation j, respectively. The index can range in value between 0 and 100, one-half of which represents the percentage of either blacks or whites who must change occupations for the two groups to have the same distribution across all occupations (see Gabriel, Williams & Schmitz, 1990; Brown, Moon, & Zoloth, 1980; and Miller and Volker, 1985 for other applications). The first column in Table 2 demonstrates the dissimilarity index for the occupations held prior to the job change; the second column shows the index after the job change; and the third column represents the difference between the two columns.[8] A value of 30.80, for example, implies that 15.40% of blacks and 15.40% of whites would have to switch occupations for the two racial groups to experience the same occupation distribution. Negative numbers in column three indicate a post-job change decrease in occupation segregation, while positive numbers indicate increasing segregation.

Note also from Table 2 that the highest racial occupational segregation before the job change is for workers who do not change from the initial occupation (dissimilarity index of 40.27), especially migrants (dissimilarity index of 54.85). After the job change, migrants are generally more occupationally segregated than non-migrants. For the full sample, a job change decreases racial occupational segregation by 1.86 points. Migration worsens racial occupational segregation by 2.21 points and changing occupation decreases racial occupational segregation by 2.72 points.

Further disaggregation reveals additional comparisons. Changes in racial occupational segregation are markedly different between migrants and non-migrants (stayers), between those who do and do not change occupation, and between those who are of good and bad match quality in their first job. While, for the full sample, changing occupations reduces racial occupational segregation by 2.72 points, changing occupation and location increases racial occupational segregation by 10.68 points while changing occupation and not migrating reduces racial occupational segregation by 3.00 points. Before the job change, migrants of both match qualities are more occupationally segregated than non-migrants. Migration increases racial occupational segregation by 13.97 points for those from good matches and 15.66 for those from bad matches, leading to the highest dissimilarity indices for all groups (dissimilarity indices of 52.68 and 55.00, respectively) in the sample. The latter result is surprising, given the evidence that blacks' relative geographical immobility contributes to their comparatively poor occupational positions.

These data suggest that migrants are more occupationally segregated by race than non-migrants and that migration increases racial occupational segregation, especially when disaggregated by match quality. Previous studies have found that younger, better educated, higher income workers tend to migrate. However, education is only one form of human capital. Good match workers may also possess an innate level of talent for a particular line of work, which is not known until on-the-job experience gives the firm and the workers the information about these talents. Migrants who begin in a bad match and begin again in a new occupation and a new location, lose both occupation and location specific human capital. If firms have less information about other forms of human capital and workers have less location specific human capital, racial discrimination may become a more prominent placement mechanism for black migrants of both match qualities than for white migrants. Black migrants may not retain as much of the "good signal" as white migrants, resulting in an increase in segregation after the job change.

The position of blacks and whites on the ladder may be dynamic. Even when racial occupational segregation appears to be unchanged, it may be that blacks are moving up/down the ladder and whites are sliding down/up. Our subsequent analysis introduces occupation ladders to shed light on these issues.

5.2 Occupation Ladders

From Table 3, we see that migrants and non-migrants begin at different positions on the occupation ladder. For whites and for both match types, there is statistically significant evidence of selection into migration by average years of education in an occupation both before and after the job change. The migration selectivity effect is stronger for whites; that is, migrant whites begin about two-thirds of a rung higher (14.87 and 14.20) on the occupation ladder than non-migrants and migrant blacks begin about one third rung higher on the occupation ladder (13.63 and 13.93). For good and bad match workers, migrants have higher average years of education than non-migrants, with the greatest difference between those in bad matches (14.77 and 14.04). Recall that because of the scale of our rung measurement (the range from

[8] The NLSY oversamples minorities. The averages presented below are adjusted by the sampling weight.

lowest rung to the highest rung is 5.5 average years of education), the differences are relatively small. All changes that are statistically significantly different from zero are negative movements. For example, bad match non-migrants move to occupations which require on average 5.2 fewer weeks of education in the new job than their pre-change occupations (-0.10).

Table 2. Indices of Dissimilarity, Before and After Job Change, by Match Quality, Migration, and Occupational Change Status

Worker Type	Before Job Change	After Job Change	Change
All Types of Workers	30.33	28.47	-1.86
Migrants*	36.59	38.80	2.21
Non-Migrants*	34.57	27.01	-7.56
Occupation Switchers	24.42	21.70	-2.72
Occupation Stayers	40.27	--	0
Good Match Workers*	30.80	31.56	0.76
Bad Match Workers*	29.61	27.34	-2.27
Migrant Occupation Switchers	27.61	38.29	10.68
Non-migrant Occupation Switchers	23.31	20.31	-3.00
Migrant Occupation Stayers	54.85	--	0
Non-migrant Occupation Stayers	38.95	--	0
Good Match, Migrants*	38.71	52.68	13.97
Good Match, Non-migrants*	30.16	31.86	1.70
Bad Match, Migrants*	39.34	55.00	15.66
Bad Match, Non-migrants*	28.24	24.50	-3.74

Source: Authors' calculations from sample of NLSY job changers, based on weighted occupational distribution, 1989/90-1994/96.
* includes both occupation switchers and occupation stayers

An interesting result emerges in the racially disaggregated match samples. Bad match white migrants begin in the highest ranked occupations (14.89) and non-migrant, good match whites begin at only a slightly higher position on the occupation ladder than non-migrant, bad match whites (14.21 and 14.17 respectively) . The pattern is somewhat different for blacks; good match black migrants begin with the highest average years of education (14.19), but, as with whites, the position on the occupation ladder is approximately the same for non-migrants by match quality (13.61 for bad match and 13.64 for good match). From these data, it appears that initial position on the occupation ladder is related more to migration than match quality for whites, but the evidence is mixed for blacks.

Bad match non-migrants of both races move down the occupation ladder after a job change (position 13.61 to 13.58 for blacks and 14.17 to 14.04 for whites), but the change is small and not statistically significant. However, bad match black migrants fall the most on the occupation ladder (position 13.79 to 13.36); this change is both economically large and statistically significantly different from zero. Good match non-migrants of both races move up the occupation ladder. Bad match white migrants make slight gains (rung 14.89 to 14.96), and good match black migrants gain the most at roughly one-third rung (from 14.19 to 14.46), although this change is not statistically significantly different from zero. After the job change, good match black migrants have surpassed the position of good match non-migrant whites (14.46 compared to 14.27), but have not caught up with good match white

Table 3. Occupational Changes: Migrants versus Non-migrants, Weighted

	Non Migrants			Migrants		
	Years Education of Workers in Occupation Pre-job change	Years Education of Workers in Occupation Post-job change	Change in Number of Rungs†	Years Education of Workers in Occupation Pre-job change	Years Education of Workers in Occupation Post-job change	Change in Number of Rungs
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Full Sample	14.09	14.02	-0.06**	14.78	14.78	0.01
	(0.04)	(0.02)	(0.04)	(0.11)	(0.11)	(0.10)
Whites	14.20	14.13	-0.07	14.87[e]	14.90[e]	0.03
	(0.05)	(0.05)	(0.04)	(0.12)	(0.12)	(0.11)
Blacks	13.63[a]	13.61[a]	-0.02	13.93[a]	13.77[a]	-0.16
	(0.05)	(0.05)	(0.05)	(0.23)	(0.20)	(0.18)
Bad Match	14.04	13.93	-0.10*	14.77[e]	14.79[e]	0.01
	(0.05)	(0.05)	(0.05)	(0.15)	(0.16)	(0.14)
Good Match	14.13	14.20[d]	0.07[d]	14.65[e]	14.77[e]	0.12
	(0.07)	(0.07)	(0.06)	(0.17)	(0.18)	(0.15)
Bad Match Whites	14.17	14.04	-0.13*	14.89[e]	14.96[e]	0.07
	(0.06)	(0.06)	(0.06)	(0.16)	(0.17)	(0.15)
Good Match Whites	14.21	14.27[c]	0.06[c]	14.70[e]	14.80[e]	0.10
	(0.08)	(0.08)	(0.07)	(0.18)	(0.19)	(0.16)
Bad Match Blacks	13.61[b]	13.58[b]	-0.04	13.79[b]	13.36[b]	-0.42*, [b, e]
	(0.06)	(0.06)	(0.05)	(0.25)	(0.19)	(0.19)
Good Match Blacks	13.64[b]	13.71[b]	0.07	14.19	14.46[c, e]	0.27[c]
	(0.12)	(0.11)	(0.12)	(0.42)	(0.35)	(0.35)

Source: Authors' calculations from NLSY 1990-1996 job changers sample.
†Numbers may not add up due to rounding error.
*, ** Statistically significant (nonzero) change at 5%, 10% level.
a Based on t-tests, black value statistically significantly different at the 5% level than white value within migration category.
b Based on t-tests, black value statistically significantly different at the 5% level than white value within migration and match quality category.
c Based on t-tests, good/bad match worker value statistically significantly different at the 5% level within race and migration category.
d Based on t-tests, good match value statistically significantly different at the 5% level from bad match value within migration category.
e Based on t-tests, migrant value statistically significantly different at the 5% level from non-migrant value within row category.

migrants (at 14.80). Our findings are quite different for bad match blacks: Those who migrate experience the greatest loss on the occupation ladder. Bad match black migrants drop 0.42 rungs on average, over three times the average decline of bad match non-migrant whites and ten times that of bad match non-migrant blacks; economically large and statistically significant differences. This is in striking contrast to the slight gains in occupation position of poorly matched white migrants noted above. These results suggest that match quality is related to changes in occupation ladder; therefore, the implications of the experience good model should be considered along with the migration decision. In other words, migration does not necessarily produce gains for blacks; their match quality has a profound effect on the influence of migration.

Many of these changes are not statistically significantly different from zero. However, holding the same occupation position (that is, no average change in the number of rungs) represents information that is important in the economic sense. A mean of zero could indicate that for every worker who moves up a

rung, another worker moves down a rung (churning) or it could indicate that workers are remaining in the same occupation. On average, about 40% of our sample of non-migrant job changes are within the same occupation and approximately 52% of migrant job changes are within the same occupation. Within the disaggregated categories, good match white migrants are most likely to have a within occupation switch (67%) and bad match black migrants the least likely (30%), and it is the latter group that has the largest negative predicted change in rungs.[9] Since these changes represent only a one year change, holding occupation ladder position on average may suggest anticipated benefits, such as a higher probability of movement up the ladder in the future. Further analysis of these issues is beyond the scope of this paper.

6. Discussion and Conclusions

These results suggest that the relative geographic immobility of blacks with respect to whites cannot explain all of the differences in occupational outcomes between the two groups, which implies that improving black spatial mobility cannot be exclusively relied on to improve their positions on occupation ladders nor to decrease occupational segregation. Our findings show that information about the productivity of workers (match quality) in a new occupation affects blacks and whites very differently, especially when coupled with migration. Migration sends some black workers up the occupation ladder and other black workers down the occupation chute. These data demonstrate that a thorough understanding of the relationship between migration, occupation mobility, and match quality is complex, and that match quality provides important information for workers and firms, the impact of which may differ by migration status.

Overall, there is a slight increase in racial occupational segregation among the workers of our sample, but this aggregate small changes masks large changes within disaggregated groups by migration status and match quality. The segregation changes are primarily driven by the relatively large gains of good match black migrants and the relatively large decline of bad match black migrants. Migration generates gains for whites regardless of match quality and a bad match signal for whites appears to be counteracted by a change in location.

Reducing racial occupational segregation does not appear to be a zero sum game; one in which black workers gain and whites lose. Overall, there is little desegregation. Evidence from Raphael and Riker (1999) argued that less mobile workers, including minorities, confront more limited labor market opportunities, which suggests that non-migrants would experience greater increases in racial occupational segregation. However, the group experiencing the greatest decrease in occupational segregation are non-migrants, driven primarily by the desegregation of poor match non-migrants. Migrants experience increases in occupational segregation. The ladder analysis demonstrates that the decrease in segregation is among the groups where both whites and blacks are moving down an occupational ladder, with blacks experiencing slightly smaller losses than whites. Migration appears to be an equilibrating force for good match workers but not bad match workers. Increasing segregation occurs among migrants leaving bad occupation matches; leaving a bad occupation match is not costly for whites, but is extremely costly for black migrants.

Several factors may contribute to the interplay of migration and occupational mobility of black migrants in a bad matches: loss of social networks, which may lead to less access to a better occupation; onward (repeat or return) migrants who are willing to accept an occupation with lower education requirements to be near family and friends; or racial differences in the willingness to trade occupation status for a residence that is racially integrated. It is unknown whether racial discrimination becomes a placement mechanism for bad match black workers and whether racial discrimination might interact with loss of location specific human capital and social networks for minorities. If one interprets a good match as an observable, formal credential for blacks, our results are consistent with the Wilson et al. (1999) finding that upward occupational mobility for blacks relies more heavily on formal, observable factors. While poorly matched blacks who migrate fare very poorly in their occupational mobility, poorly matched whites with a similar observable wage signal for firms, do not. Future research should be focused on racial differences in the relationship between migration and match quality.

[9] The other disaggregated changes are all qualitatively similar to the migrant/non-migrant averages shown in Table 3 (results not shown; available from authors upon request).

References

Brown, R. S., M. Moon, and B. S. Zoloth. 1980. "Occupational Attainment and Segregation by Sex." *Industrial and Labor Relations Review.* 33(4):506-517.

Fallick, B. C. 1993. "The Industrial Mobility of Displaced Workers." *Journal of Labor Economics.* 11(2):302-323.

Gabriel, P. E., D. R. Williams, and S. Schmitz. 1990. "The Relative Occupational Attainment of Young Blacks, Whites, and Hispanics." *Southern Economic Journal*. 57(1):35-46.

Hall, R. E. and R. A. Kasten. 1973. "The Relative Occupational Success of Blacks and Whites." *Brookings Papers on Economic Activity*. 3: 781-797.

_____. 1979. "Occupational Mobility and the Distribution of Occupational Success among Young Men." *American Economic Review Papers and Proceedings.* 66(2):309-315.

Johnson, J. H., Jr. and C. C. Roseman. 1990. "Increasing Black Outmigration from Los Angeles: The Role of Household Dynamics and Kinship Systems." *Annals of the Association of American Geographers.* 80(2):205-222.

Jovanovic, B. 1979. "Job Matching and the Theory of Turnover." *Journal of Political Economy.* 87(5):972-90.

Jovanovic, B. and Y. Nyarko. 1996. "Stepping Stone Mobility." *National Bureau of Economic Research Working Paper #5651*.

Krieg, R.G. 1990. "Does Migration Function to Reduce Earnings Differentials by Race and Gender?" *Annals of Regional Science*. 24:211-221.

Lee, S. and C. C. Roseman. 1997. "Independent and Linked Migrants: Determinants of African American Interstate Migration." *Growth and Change.* 28:309-334.

Long, L. 1973. "Migration Differentials by Education and Occupation: Trends and Variations." *Demography.* 10:243-258.

Miller, P. W. and P. A. Volker. 1985. "On the Determination of Occupational Attainment and Mobility." *The Journal of Human Resources.* 20(2):197-213.

O'Regan, K. M. 1993. "The Effect of Social Networks and Concentrated Poverty on Black and Hispanic Youth Unemployment." *Annals of Regional Science.* 27(3):327-342.

Raphael, S. and D. A. Riker. 1999. "Geographic Mobility, Race, and Wage Differentials." *Journal of Urban Economics.* 45(1):17-46.

Robst, J. 1995. "Career Mobility, Job Match, and Overeducation." *Eastern Economic Journal.* 21(4):539-550.

Ross, S. L. 1998. "Racial Differences in Residential and Job Mobility: Evidence Concerning the Spatial Mismatch Hypothesis." *Journal of Urban Economics*. 43(1):112-135.

Sicherman, N. 1991. "'Overeducation' in the Labor Market." *Journal of Labor Economics.* 9(2):101-122.

Sicherman, N. and O. Galor. 1990. "A Theory of Career Mobility." *Journal of Political Economy.* 98(1):169-192.

Stoll, M. A. and S. Raphael. 2000. "Racial Differences in Spatial Job Search Patterns: Exploring the Causes and Consequences." *Economic Geography.* 76(3):201-230.

Topel, R.H., and M.P. Ward. 1992. "Job Mobility and the Careers of Young Men." *Quarterly Journal of Economics.* 107(2):439-79.

Waddoups, J., N. Daneshvary, and D. Assane. 1995. "An Analysis of Occupational Upgradings Differentials between Black and White Males." *Applied Economics.* 27(9):841-847.

White, N. E. and A. M. Wolaver. 2003. "Occupation Choice and Migration" *Review of Regional Studies.* 33(2):22-43.

Wilson, G., I. Sakura-Lemessy, and J. P. West. 1999. "Reaching the Top: Racial Differences in Mobility Paths to Upper-Tier Occupations." *Work and Occupations.* 26(2):165-186.