

2001

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Recommended Citation

Agesa, J., Agesa, R. U., & Hoover, G. A. (2001). Market structure and racial earnings: Evidence from job-changers. *The American Economic Review*, 91(2), 169-173.

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Market Structure and Racial Earnings: Evidence from Job-Changers

By JACQUELINE AGESA, RICHARD U. AGESA, AND GARY A. HOOVER*

In his seminal contribution, Gary Becker (1957) suggests that rents in noncompetitive industries provide employers with the latitude to engage in earnings discrimination. Implicit in this theory, is that white workers in noncompetitive industries would capture a disproportionate share of monopoly rents (excessive wages) relative to their minority counterparts.¹

Previous studies that have examined market structure and earnings discrimination utilize a cross-sectional approach, which compares the racial wage gap in highly concentrated noncompetitive industries with the gap in less concentrated competitive industries, yielding mixed results (see James Peoples [1994] for a review of this literature). However, noncompetitive industries pay higher wages and may attract more-productive workers. A shortcoming of this approach, therefore, is that unmeasured productivity differences between workers in noncompetitive and competitive industries could partially explain differences in earnings under different market structures. Consequently, these analyses may provide distorted estimates of the relationship between market concentration and racial earnings.

This study augments the above literature by investigating the relationship between market concentration and racial earnings using data sets that rectify the measurement problem of productivity differences between workers under opposing market structures. Specifically, two samples of workers who have changed employment are used to examine earnings by race of workers in pre- and post-employment-change

industries. The research methods resemble those of Janice F. Madden's (1987) study of cost of job displacement by gender.

If noncompetitive industries engage in racial earnings discrimination, then wages of white workers in these industries would be above the market wage; wages of minority workers would be below. Therefore, we would expect that white workers who leave noncompetitive industries experience substantially greater earnings loss than if they had remained in noncompetitive industries relative to their minority counterparts. Similarly, we would expect greater earnings gains for white workers from joining noncompetitive industries, than from remaining in competitive industries, relative to minorities. Moreover, this would indicate that whites in noncompetitive industries are disproportionately the beneficiaries of labor rent-sharing relative to their minority co-workers.

We utilize wage-change equations to examine earnings shifts for whites and minorities stemming from a job switch to a different market structure. Additionally for each racial group, wage equations of workers before and after the job change are used to calculate difference-in-differences estimates of wage change as a result of the job switch. The findings contradict the stated hypothesis: gains in minority wages from joining noncompetitive industries and losses in wages from leaving are larger, suggesting that (for minorities) the higher, less discriminatory wages of union employment in noncompetitive industries outweigh employer discrimination in non-union, noncompetitive industries.

I. Data and Methodology

This study uses individual data from two sources. The first is the 1984–1998 biannual Displaced Worker Survey (DWS) supplement to the Current Population Survey (CPS). This constructed data set consists of workers aged 16 and older who were displaced from and

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¹ The term "minority" indicates nonwhite workers.

reemployed in manufacturing industries, yielding a sample of 274 minority and 2,135 white workers. An advantage of using displaced workers in measuring wage change is that, because job change is involuntary (exogenous), it is not the result of workers' expectations about the availability of better jobs. A disadvantage, however, is that only a fraction of survey applicants provide pre-displacement earnings, resulting in the small sample sizes.

The second source of data is matched samples of manufacturing workers in the CPS Outgoing Rotation Groups (ORG's) from 1984 to 1998. A unique feature of the ORG's is that workers appear in the survey twice (12 months apart). Past researchers have used this feature to create panel data of workers; however, a disadvantage of using the constructed CPS panel is that some job switches may be endogenous. Nevertheless, Barry Hirsch and David Macpherson (1998) argue that the symmetry in wage change of entering and leaving the tested group (in our case, noncompetitive markets) is evidence of the relative unimportance of endogenous switching.² This matching procedure yields 1,632 minority and 12,762 white workers who have changed employment over the 12 months between survey appearances.

Bridged to each data set of individual workers are measures of industry characteristics from the 1987 and 1992 *Census of Manufacturers* (Bureau of the Census, 1989, 1994). Industry characteristics from the 1987 *Census* were used to describe a worker's pre-employment-change industry, if the worker's first job ended before 1992, while the 1992 *Census* was used for all occurring thereafter. Characteristics of the post-employment industry were assigned similarly. Industry characteristics include the pre- and post-change capital-to-labor ratio ($K/L = [\text{industry gross book value of plant and equipment}]/[\text{industry employment}]$) and plant size ($= [\text{industry employment}]/[\text{number of establishments}]$). Four firm concentration ratios, also taken from the *Census*, were converted from four-digit to three-digit SIC industry coding by

weighing the industry value of shipments. A switching regression technique was used to bifurcate employees into high-concentration, non-competitive industries and low-concentration, competitive industries. The critical concentration ratio was taken to be 40 percent. The CPI, used to deflate pre- and post-employment earnings to 1985 dollars, was taken from *Economic Report of the President 1998* (Council of Economic Advisers, 1998).

The specification employed resembles previous studies of wage change after a job switch (Henry Farber, 1993). However, separate equations are used to estimate wages of minorities and whites, allowing a different structure of real-wage change for the two groups, specified as follows:

$$(1) \quad \Delta W_i = \mathbf{a}\mathbf{X}_i + b(\text{NC_C}) + c(\text{NC_C}) + d(\text{C_NC}) + \varepsilon_i$$

where ΔW_i is the change in the log of real weekly wages from pre- to post-employment in 1985 dollars. The vector \mathbf{X} includes individual and industry controls that determine wage change. Using the DWS, vector \mathbf{X} includes age and its square, years of tenure in the pre-displacement job, six dummies for educational attainment, three dummies indicating region of employment, and four dummies indicating pre- and post-occupational group. Other individual controls include dummies for full- and part-time status in pre- and post-employment, gender, and marital status. Industry variables are included in \mathbf{X} to control for the effects of changes in industry characteristics from the pre- to the post-employment industry on earnings change for each racial group. They include the change in the capital-to-labor ratio and the change in plant size. Dummies that account for the change in market structure include NC_C, for workers who moved from noncompetitive to competitive industries. Similarly, the other market-structure dummies are NC_NC and C_NC, with workers moving from competitive to competitive industries as the base group. The coefficient on each variable captures the effect of that variable on earnings changes for

² For each racial group, the symmetry of wage change is illustrated by the relative equality of wage differences (in absolute value) of workers leaving and entering noncompetitive markets (see columns b and d of Table 2).

TABLE 1—WAGE CHANGE OF INDIVIDUALS WHO CHANGED EMPLOYMENT

Independent variable	DWS		Matched CPS	
	White (i)	Minority (ii)	White (iii)	Minority (iv)
<i>K/L</i>	-0.008 (-0.94)	-0.005 (-0.16)	-0.001 (-0.57)	-0.004 (0.05)
Plant size	-0.032 [†] (2.1)	0.004 (0.12)	-0.002 [†] (1.8)	-0.003 (0.97)
NC_NC	-0.051 (-0.69)	-0.217 (-1.1)	-0.011 (0.89)	0.011 (0.31)
NC_C	-0.181 (-1.0)	-0.788 [†] (-1.7)	-0.019 (1.8)	-0.014 (0.31)
C_NC	-0.093 (-0.53)	-1.14 [†] (-1.8)	-0.022 (1.42)	-0.075 [†] (1.7)
Dummies for:				
Previous years of tenure	yes	yes	no	no
Geographic region	yes	yes	yes	yes
Full or part time	yes	yes	yes	yes
Human capital	yes	yes	yes	yes
Year in sample	yes	yes	yes	yes
Occupation	yes	yes	yes	yes
Union status	no	no	yes	yes
<i>R</i> ² :	0.328	0.482	0.023	0.021
Sample size:	2,135	274	12,762	1,632

Notes: NC indicates noncompetitive, and C indicates competitive industry. Thus NC_C indicates that the worker switched from a noncompetitive to a competitive industry. The other two variants of pre- and post-job change in market structure follow a similar pattern, with workers switching from competitive to competitive industries as the base group. *K/L* is the capital-to-labor ratio. Numbers in parentheses are *t* statistics.

Source: Displaced-worker data were taken from the biannual Displaced Worker Supplement to the CPS, 1984–1998. Matched CPS manufacturing-worker data were taken from the CPS ORG, 1984–1998.

[†] Statistically significant at the 10-percent level.

that racial group. The coefficients on the change-in-market-structure dummies are key because they measure the earnings change in moving to and from noncompetitive and competitive industries, relative to workers who stay in competitive industries, for each racial group.

Using the constructed CPS panel, the vector **X** differs from the above in that it does not include a control for years of tenure in the previous occupation. However, dummies for union status in pre- and post-change employment are included.

II. Findings

Columns (i) and (ii) of Table 1 present the earnings change for each racial group [equation

(1)] using the DWS sample. An increase in plant size from the displacement to the reemployment industry significantly decreases earnings loss for whites, while it insignificantly increases the loss for minorities.³ Of central importance are the results for the change in market-structure dummies. For minorities whose initial employment is in competitive industries, joining a noncompetitive industry significantly reduces earnings loss by 68 percentage points relative to remaining in competitive industries [see coefficients on C_NC, in column (ii)]. By contrast, joining a noncompetitive industry insignificantly reduces earnings loss of whites by 8.8 percentage points relative to remaining in a competitive industry [see coefficients on NC_C, in column (i)]. The *t* test of the difference between the NC_NC and NC_C variables for white displaced workers fails to reject the hypothesis of equal wage loss for noncompetitive-industry non-leavers and leavers; the *t* statistic is -0.78. The *t* test of the difference between minority non-leavers and leavers in noncompetitive industries just barely fails to reject the hypothesis of equal wage loss between the two groups, yielding a *t* statistic of -1.5.

Columns (iii) and (iv) of Table 1 present the wage-change estimates using the CPS matched panel. An increase in plant size for whites significantly reduces earnings loss by 0.03 percentage points, while it insignificantly influences wage changes for minorities. The market-structure dummies are insignificant in both the white and minority equations, with the exception of the significant coefficient on C_NC, for minority workers moving from competitive to noncompetitive industries. Indeed, joining a noncompetitive industry significantly reduces earnings loss for minorities, by 7.2 percentage points. Moreover, earnings change for minorities in the matched CPS panel and the DWS indicates earnings gains in noncompetitive industries (relative to competitive industries) that are not a result of increased human-capital investment. These findings suggest that minorities are beneficiaries of labor rent-sharing.

Next, the CPS ORG panels are divided into the four variants of the job-switch market-structure groupings (NC_C, NC_NC,

³ The conversion into percentage differentials is given by $(e^{\text{coefficient}} - 1) \times 100$.

TABLE 2—DIFFERENCE-IN-DIFFERENCES ESTIMATES OF WAGES (IN PERCENTAGE POINTS)

A. Workers Leaving Noncompetitive-Industry Jobs:			
Racial group	NC_NC (a)	NC_C (b)	(b) - (a)
Minority (M)	6.41	-12.51	-18.92
White (W)	5.07	-3.77	-8.84
Difference (M - W):	1.34	-8.74	
B. Workers Leaving Competitive-Industry Jobs:			
Racial group	C_C (c)	C_NC (d)	(d) - (c)
Minority (M)	1.16	15.16	14.00
White (W)	-2.03	5.52	7.55
Difference (M - W):	3.16	9.64	

Note: See notes to Table 1 for definitions of NC_NC, NC_C, C_C, and C_NC.

Source: CPS ORG panel, 1984-1998.

C_C, and C_NC) for each racial group. Separate wage equations are estimated for each sample before and after the job change. Such a procedure removes the fixed-effects restriction on earnings changes for workers entering and leaving noncompetitive industries and allows a separate earnings structure before and after the job switch and by market structure. Further, the procedure allows difference-in-differences estimates of the difference in wage change for minorities and whites entering and leaving noncompetitive industries.

Findings of the difference-in-differences procedure are presented in Table 2. Earnings losses for minorities and whites leaving noncompetitive industries are 12.51 and 3.77 percentage points respectively. Further, leaving a noncompetitive industry causes a 18.92-percentage-point greater earnings loss for minorities and a 8.84-percentage-point greater loss for whites than the loss of workers belonging to each racial group remaining in a noncompetitive industry. Additionally, movement to a noncompetitive industry invokes earnings gains of 15.16 and 5.52 percentage points for minorities and whites, respectively, with minorities and whites experiencing 14.0- and 7.55-percentage-

point larger gains than those in competitive industries.

III. Conclusions

Past empirical testing of the relationship between market structure and racial earnings has involved two sources of distorting measurement error: error resulting from unobserved differences between workers in noncompetitive and competitive industries and error resulting from unobserved differences between white and minority workers. This study utilized two data sets of employment-changers to examine workers' earnings under opposing market structure, thereby eliminating the first error source. Elimination of the latter would be daunting because it would entail observing workers' earnings if they were white and if they were minority. Our findings provide evidence of larger minority wage gains from entering noncompetitive industries and greater loss from leaving, relative to whites. These findings may contradict the hypothesized relationship between racial earnings and market structure for two reasons. First, noncompetitive industries are more unionized than competitive industries. Second, union employment offers higher and more standardized (i.e., less discriminatory) wages than does nonunion employment (Richard Freeman, 1980). Thus, minority wage gains in entering noncompetitive industries are large because the effects of the increased likelihood of a higher, less discriminatory union wage outweighs employers' increased latitude to practice wage discrimination in nonunion noncompetitive employment. This interpretation is consistent with past cross-sectional findings of large racial wage gaps in nonunion employment in noncompetitive industries and small, insignificant racial wage gaps for union members (Peoples, 1994).

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