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Racial Discrimination and Trade Unionism

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Current labor market discrimination against black workers is the result of racial prejudice after it has been filtered through market institutions. The purpose of this paper is to examine several hypotheses about the way in which the institution of trade unionism affects the ratio of black to white wages and then to test these hypotheses. Although there has long been interest in the effect of organized labor on the labor market status of black workers, this has not gone much further than to document that some trade unions are relatively egalitarian while others are very discriminatory.[1] In recent years this issue has become pressing in the extreme, and it seems clear that further quantitative work on this subject is needed. First, since the passage of the 1964 Civil Rights Act efforts to eliminate economic discrimination against racial minorities have become a matter of federal public policy. In view of this it would be helpful to know the extent to which trade unions exacerbate (or mitigate) labor market discrimination, whether this effect has changed over time, and the extent to which alternative types of union organization have different effects on the wages of blacks relative to whites.[2] Second, although the

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[1] Two important references are Herbert R. Northrup, Organized Labor and the Negro, New York 1944, and Ray Marshall, The Negro and Organized Labor, New York 1965.

[2] This last issue is particularly relevant given the substantial controversy surrounding the special treatment of the construction industry embodied in the so-called "Philadelphia Plan," which sets up a form of quota for minority representation in the building construction trades when federal construction work is involved. See Richard R. Nathan, Jobs and Civil Rights, Washington 1969, esp. pp. 108-12. In the fall of 1969 the U.S. Secretary of Labor announced the Labor Department's intention to extend this plan to a sizeable number of major cities throughout the U.S. By 1971 it had been extended in various forms to a number of other cities, though there was significant debate as to its actual as opposed to its promised effects.

effects of unions on resource allocation have been an issue of discussion for some time,[3] very little evidence on union effects on labor market discrimination has been incorporated into this discussion. It may, in fact, be argued that this is one of the most important contemporary social and economic questions raised by the presence of trade unionism in the U.S. economy. Finally, since black workers are more generally found in the less skilled occupational groups than are whites, evidence on the effect of unions on the wages of blacks relative to whites should shed additional light on the general question of union effects on skill differentials.

The plan of the paper is as follows: Section I contains a conceptual framework for purposes of measurement, a discussion of the likely determinants of a union's racial policy, and some evidence on the extent to which unionization tends to narrow (or widen) wage differentials between broad types of labor. Section II contains estimates of the effect of unionization on racial wage differentials from several sets of microeconomic, inter-industry, and inter-state cross-sectional data. Some concluding remarks are contained in Section III.

I. A Conceptual Framework

For purposes of what follows it is useful to define the aggregate effect of unionism on the average wage of black labor relative to white

[3] See, for example, Albert Rees, "The Effects of Unions on Resource Allocation," The Journal of Law and Economics, October 1963.

labor as:

$$(1) \quad \Delta^* = [(R_b/R_w) - (R_b^c/R_w^c)]/(R_b^c/R_w^c) \ ,$$

where (R_b/R_w) is the observed black/white wage ratio in the presence of unionism and (R_b^c/R_w^c) is what the wage ratio would be in the absence of unionism.[4] Although we might like to estimate Δ^* under varying conditions and over time, we should not be very optimistic about doing so because the wage ratio (R_b^c/R_w^c) is in general unobservable. To clarify this issue it is useful to rearrange terms in (1) and write its logarithmic transform as:

$$(2) \quad \ln(1+\Delta^*) = \ln(R_b/R_w) - \ln(R_b^c/R_w^c) \ .$$

Proceeding, we define $M_b \equiv (R_b^u - R_b^n)/R_b^n$ and $D_b \equiv (R_b^n - R_b^c)/R_b^c$, where R_b^u is the average wage of unionized black workers, R_b^n is the average wage of nonunion black workers, and R_b^c is the average wage of black workers in the absence of unionism. M_b is thus the proportionate union/nonunion wage advantage (disadvantage) of organized black workers, while D_b is the proportionate effect of unionism on the wage of nonunion black workers.[5]

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[4] This procedure obviously owes a great deal to the work of H.G. Lewis, Unionism and Relative Wages in the United States, Chicago 1963, the most important general reference on unions and relative wages to date. Notice that knowledge of Δ^* does not allow us to say anything about the level of either the white or Negro wage in the presence or absence of unionism.

[5] This recognizes explicitly that the mere presence of unionism in part of the economy may affect the wage of nonunion workers. D_b (or D_w) might be negative, for example, if wages were raised in the union sector and this forced employees out of that sector and into the nonunion sector, thereby bidding wages below their levels in the absence of unionism. D_b (or D_w) might be positive, for example, if the threat of unionism induced employers to buy off the threat with higher wages.

Now the average wage of black workers in the presence of unionism may be taken as the weighted geometric mean of the wages of union and nonunion black workers, so that its logarithm is:

$$(3)\quad \ell nR_b = B\ell nR_b^u + (1-B)\ell nR_b^n$$
$$= B\ell n[R_b^c(1+D_b)(1+M_b)] + (1-B)\ell n[R_b^c(1+D_b)]$$
$$= \ell nR_b^c + B\ell n(1+M_b) + \ell n(1+D_b) \quad ,$$

where B is the proportion of black workers who are unionized. The analogue of (3) for white workers is:

$$(4)\quad \ell nR_w = \ell nR_w^c + W\ell n(1+M_w) + \ell n(1+D_w) \quad ,$$

where W is the proportion of white workers who are unionized, M_w is the proportionate union/nonunion wage advantage (disadvantage) of organized white workers, and D_w is the proportionate effect of unionism on the wage of nonunion white workers. Substitution of (3) and (4) into (2) gives

$$\ell n(1+\Delta^*) = B\ell n(1+M_b) - W\ell n(1+M_w) + \ell n(1+D_b) - \ell n(1+D_w) \quad ,$$

which may be closedly approximated by

$$(5)\quad \Delta^* = (BM_b - WM_w) + (D_b - D_w) \quad ,$$

so long as M_b, M_w, D_b, and D_w are not large.

Now (5) says that the effect of unionism on the black/white wage differential is composed of three separate effects. One of these is the difference in the effects of unionism on the wages of nonunion black and

white workers, $D_b - D_w$. These effects are in general unobservable, so that little is known about their size or incidence.[6] In view of this it is clearly not possible to estimate Δ^*, the proportionate difference between the black/white wage ratio in the presence of unionism versus what it would be in the absence of unionism, except under special circumstances. Accordingly, we propose the more modest task of estimating

$$(6)\quad \Delta \equiv \Delta^* - (D_b - D_w) \equiv BM_b - WM_w,$$

the component of Δ^* that may be observed. Δ is nothing more than the proportionate difference between the average black/white wage ratio of all workers and the average black/white wage ratio of nonunion workers.[7] Of course, $\Delta \gtrless \Delta^*$ if the effects of unionism on nonunion wages do not differ much by racial group.

According to (6) the effect of unionism on the black/white wage ratio of all workers relative to the black/white wage ratio of nonunion workers is composed of two separate effects. On the one hand B may be larger or smaller than W. If unions tend to exclude blacks so that $B<W$, then so long as $M_b \leq M_w$ and $M_w>0$, i.e., so long as unions do cause positive wage effects for whites, Δ will be less than zero. On the other hand, M_b may be larger or smaller than M_w. If unions tend to favor white unionists

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[6] An effort to examine the size of D for all workers under various sets of hypothetical conditions is contained in Harry G. Johnson and Peter Mieszkowski, "The Effects of Unionization on the Distribution of Income," The Quarterly Journal of Economics, November 1970, pp. 539-561.

[7] That is, $\Delta=[(R_b/R_w) - (R_b^n/R_w^n)]/(R_b^n/R_w^n)$, as may readily be verified from (1)-(5) and the definitions underlying them.

when bargaining over wages or upgrading so that $M_b < M_w$, then Δ will again be less than zero so long as $B \leq W$. It should be clear, however, that on the basis of currently available evidence of union wage effects Δ is not likely to be very large in either direction in the U.S. For example, suppose that 25 percent of the white labor force is unionized and that unions raise the average wage of union workers 15 percent above that of nonunion workers. Suppose also, as is contrary to fact, that either all black workers are excluded from unions or that $M_b = 0$. In this case $\Delta \approx -.04$. If the wages of all black male workers were approximately 60 percent of all white males workers, even under the extreme assumption above they would be only 62 percent of those of white workers in the nonunion sector.

In practice, however, it is not possible on the basis of available evidence of union race policies to suggest even the sign of Δ. First, consider the factual question of whether B is larger or smaller than W. The available evidence is summarized in Table 1. This evidence suggests that there is little difference between B and W, and that the direction of the difference is ambiguous. Second, consider the question of whether M_b is larger or smaller than M_w. M_b would tend to be smaller than M_w if, for example, (i) black unionists tended to be more heavily concentrated in those unions which have the smallest positive effects on wages, or if (ii) unions tended to favor their white members in negotiation of wages and working conditions. With regard to (i) not enough evidence has been accumulated on either the incidence of union relative wage effects by industry or the

TABLE 1

Estimates of the Percentage of Workers Unionized by Race and Sex

Line No.	Year and Source of Estimates	Black Workers	White Workers	Black Male Workers	White Male Workers	Black Female Workers	White Female Workers
1	1967, Survey of Economic Opportunity	23	23	32	31	13	12
2	Early 1960's, F. Ray Marshall	Between 19 & 26	Between 21 & 22	----	----	----	----

Sources: Line 1 comes from the special 1967 Survey of Economic Opportunity, an especially supplemented version of the Current Population Survey. See the notes to Table 5 and text Section II.A for further discussion of this body of data. Line 2 was computed from the available data on the total number of unionists (Leo Troy, "Trade Union Membership, 1897-1962," The Review of Economics and Statistics, February 1965) and the white and black work forces in the early 1960's (Handbook of Labor Statistics, Washington, D.C., 1968, Table II) along with Ray Marshall's (op.cit., pp. 311-312) estimate that there were between 1.5 and 2.0 million black unionists in this period.

distribution of black unionists by industry to even be suggestive. On the one hand, for example, it is estimated that during the 1950's union wage effects were "large" in both bituminous coal mining and among commercial airline pilots.[8] Yet black workers are fairly well represented in the former, but not in the latter.[9] With regard to (ii) there is wide disagreement among observers of the casual evidence as to whether any observed differential treatment of unionized black workers is the result of unionization or whether it existed prior to unionization and is essentially the result of other factors.[10]

Given the ambiguity of the general evidence on unionism and racial wage differentials it is clearly necessary to examine in more detail the way in which union organization of a labor market may affect the relative wages of blacks. In this context it is useful to examine two separate, but related factors in union policy. First, we look to the

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[8]See Lewis, op.cit., pp. 185-5.

[9]Bituminous coal mining is virtually completely organized, and it is widely believed that the United Mine Workers have historically followed a racially egalitarian policy. It has been estimated elsewhere (see Orley Ashenfelter, Minority Employment Patterns, U.S. Equal Employment Opportunity Commission, 1968) that even in the South the ratio of the number of black craftsmen and operatives to the number of white craftsmen and operatives in bituminous coal was on the order of .08. On the other hand, the 1960 Census of Population reports (Final Report PC(2) - 7A) that of 26,615 "airline pilots and navigators" in the U.S. only 60 were black, which gives a black to white ratio of less than .003.

[10]Compare, for example, the opinions of Slichter, Healey, and Livernash in The Impact of Collective Bargaining on Management, Washington 1960, pp. 30-31, who argue that craft unions practice discrimination but that the practical effect of this has been unimportant because discrimination was well established prior to unionization, with the contrary arguments of Herbert Hill in "The Racial Practices of Organized Labor--the Age of Gompers and After," in Arthur M. Ross and Herbert Hill (eds.), Employment, Race, and Poverty, New York 1967, pp. 396-7.

determinants of a union's explicit policy with regard to race in the labor market. Second, we examine union policies and practice on the narrowing (or widening) of wage differentials between different skill groups without regard to race.

A. Union Race Policy

In discussing explicit union policies regarding race it is useful to start from the widely accepted model of trade union behavior which is based on a separate analysis of the motivation of the union leadership and rank-and-file. By this view the objectives of the leadership are: (1) the survival and growth of the union as an institution, and (2) the personal political survival of the leaders. These objectives are accomplished, in most part, by satisfying the desires of the actual, and in some cases potential, rank-and-file members.

Let us suppose that prior to unionization the distribution of the intensity of distaste for association with black laborers among the white members of the work force in a given union's jurisdiction may be arrayed along a continuum.[11] Given this distribution of distastes the racial policy of a union which organizes this jurisdiction will depend upon: (1) the type of political mechanism by which the leadership assures the continuance of its personal power and survival, (2) the type of

[11]The intensity of a worker's distaste is the market analogue of the extent of his "prejudice." See Gary Becker, The Economics of Discrimination, Chicago 1956, for the classic analysis using this framework.

economic mechanism that the leadership may use to satisfy rank-and-file expectations concerning wages, hours, and working conditions--the latter being the objective of the rank-and-file--and (3) the extent to which the jurisdiction is composed of actual, or potential, black workers. These factors are important because ceteris paribus, (1) determines the extent to which the views of the white majority versus those of the black minority will affect the formulation of the race policy, while (2) determines what effect this policy may have on black workers and (3) determines what this policy will be. The clear implication is that the ideological commitments of the leadership per se will not have much influence on the resultant race policy.[12] Consequently, leadership pronouncements that are more for the ears of others than its own rank-and-file are likely to be of dubious help in discerning the actual policy.[13]

(i) The union's political mechanism will determine the extent to which the leadership is responsive to the wishes of the rank-and-file. At one extreme the leadership is well insulated from the rank-and-file. In this case race policy will be a matter of little concern.[14] At the other extreme the leadership is heavily dependent on the demands of the rank-and-

[12]This implication is consistent with the view of Scott Greer, who writes after an extensive study of Negro/union relations in Los Angeles: "Thus it is usually safe to take the ideology of the union leader as an irrelevant or dependent factor and his place in the power structure of the local, together with the kind of local, as the chief cause of his behavior." See his excellent analysis in Last Man In: Racial Access to Union Power, (The Free Press of Glensoe, Illinois, 1959). Ray Marshall also expresses this view and offers as the reason for it the fact that "Few union leaders will go out of their way to look for trouble because they usually feel that they have enough already," op.cit., p. 314.

[13]In view of this it seems strange that so many recent commentators are surprised by the sizeable gap between the statements of executive officers of, say, the AFL-CIO and the actual practices of their constituent unions.

[14]These unions have been described by Herbert Northrup as "Laissez-faire on the race issue." See his Organized Labor and the Negro, (New York: Harper and Brothers, 1944), pp. 232-38, for examples. As Greer notes, in these unions"...the entire decision as to ethnic job-opportunities is given to management, even when the ethnic workers have already gained a substantial foot-hold in the work force," i.e. even when the ethnic group makes up a sizeable portion of the union's constituency, op.cit., p. 135.

file and in this case the resulting racial policy will depend on the fraction of the workers in the union's jurisdiction who are black. If that fraction is small the race policy will reflect the racial views which are dominant among the white membership, and these may be very discriminatory. When the black fraction of the jurisdiction becomes large enough, however, the resultant race policy is likely to be anti-discriminatory with the result that the union may enforce equal-opportunity contract clauses against the wishes of a discriminatory management. Such an anti-discriminatory policy may result under these conditions for one or both of two reasons. First, since blacks will feel especially strongly with regard to the race policy, and since there are likely to be several union policies constructed simultaneously, log-rolling tactics may secure the black membership a disproportionate effect on the resultant race policy.[15] Second, where black workers are a large fraction of the union's jurisdiction it will generally not be possible to organize that jurisdiction, or maintain the existence of previous organization of that jurisdiction--which, after all, is the objective of the leadership--unless

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[15] See Gary Becker, op.cit., pp. 62-64 for a similar conclusion with respect to log-rolling and the race issue, but in the context of a general governmental body. Greer apparently finds this outcome in his case study of "membership-dominated, plant-oriented locals." For he notes with respect to these locals that "...in each local there was some formal structure meant to decrease discrimination [from employers] against minority members. The representation of Mexicans and Negroes in the power structure of the locals (1) increased the pressure on the staff to make race an issue and (2) yielded the elected officers political support for such a position," Op.cit., p. 148.

black workers are promised and accorded equal treatment.[16] For failure to organize the black worker, which will generally be the result of any attempt at unequal treatment, provides the employer with a ready source of substitutable nonunion labor.

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[16]The annals of unionism are replete with the formation of union racial policies which may be explained on this basis. For example, in its earliest years the American Federation of Labor adopted an egalitarian racial policy and in 1890 refused to admit a machinist's union because it discriminated against fellow workers. Samuel Gompers justified this on the grounds that, "If we do not make friends of the colored men they will of necessity be justified in proving themselves our enemies." See Herbert Hill. op. cit., p. 370. It did not take long for Gompers to realize that he had misjudged the road to expansion, however, for as the Knights of Labor with its ideal of racial solidarity disappeared as a rival to the AFL, "the Federation heads soon came to realize that their ideals were standing in the way of expansion," Herbert Northrup, op. cit., p. 8. Second, those few unions who have traditions as the most egalitarian on the race issue, e.g., the United Packinghouse Workers and to a lesser extent the United Auto Workers, United Steel Workers and United Mine Workers, all had sizeable numbers of black workers in their jurisdictions prior to organization. In addition, in each one of these unions' jurisdictions attempts to organize prior to adoption of an egalitarian policy had been met by failure due at least partially to the use of black strikebreakers. Ray Marshall concludes that "...the CIO [Congress of Industrial Organizations, or which these unions were the leaders] was forced to adopt such [equalitarian] policies if it hoped to organize the basic industries where large numbers of Negroes were concentrated . . . the CIO's policies were influenced by those of the United Mine Workers which had learned long before that the Southern coal mines could not be organized on other than an equalitarian basis." op. cit., p. 49. The most famous recent example is, of course, the unionization of Public Works employees in Memphis in 1968 by the American Federation of State, County, and Municipal Employees, which came about primarily as an effort by black workers to overcome a long history of discriminatory employment practices by the city government. See Ray Marshall and Arvil Van Adams, "Racial Negotiations--The Memphis Case," mimeo., 1969.

(ii) The economic mechanism by which the union affects wages and working conditions determines the extent to which black workers may be excluded from the union's jurisdiction and the extent to which promotional and up-grading opportunities may be controlled. At one extreme the union affects wages and conditions by exercising a monopoly control of the supply of labor. Organization in this instance normally follows the lines of a narrow skill grouping, both so as to keep the ratio of labor costs to total costs low in the union's jurisdiction and so as to maintain control of entrance to the skill. A natural concomitant of a discriminatory race policy in this situation is exclusion of blacks from the union and thus from employment in the union's jurisdiction.[17] An important result of such exclusionary policies is the elimination of promotion possibilities for black workers within an industry organized on the basis of narrow crafts even when black workers make up a substantial fraction of the industry.[18] At the other extreme the union affects wages and conditions solely through the use of a bargained settlement based on a strike-threat. Organization in this instance must normally be all inclusive so as to ensure the efficacy of a possible strike.

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[17] In practice there are very few, if any unions that fit this picture of perfect monopoly control of labor supply. Perhaps the closest are a few unions in the building construction trades such as the plumbers and sheet metal workers. See Herbert Hill, "Racial Inequality in Employment: The Patterns of Discrimination," The Annals of the American Academy of Political and Social Science, January 1965, pp. 30-47. Most unions fall either in between the monopoly supply and strike-threat (seebelow) extremes or at the latter.

[18] As greer notes, op.cit., pp. 37-38, "...in the craft-organized work forces, in which each job-level is organized by a separate union, Mexicans and Negroes are apt to remain in unskilled labor jobs until they saturate the local unions involved, without ever moving to the next step above..."

A discriminatory race policy in this situation typically cannot result in union exclusion from employment because the hiring decision remains in the hands of the employer, and once hired it is essential that a worker's support be enlisted.[19] So long as the union bargains over working conditions, however, it may be able to insist upon discriminatory treatment of black workers, particularly with respect to seniority and promotional possibilities.[20]

Table 2 contains some recently compiled data for several important building construction and printing trade unions that may be used to roughly evaluate the preceding arguments. First, some readers will be surprised to find that blacks make up a sizeable 8.4 percent of all the unionists in the building construction trades, an industry whose unions are widely believed to be very discriminatory. Since blacks make up about 11 percent of the production workers in the construction industry this implies that $B/W \approx .8$ even for this industry. Building construction, however, is organized along the lines of very narrow skill groups, so that the above analysis predicts that ceteris paribus blacks will tend to be concentrated in the least skilled categories. Indeed, nearly 80 percent of all the black unionists in building construction are found in the Common Labors Union,

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[19] As Marshall notes, op.cit., p. 128, "...craft unions at the local level consider it to be to their advantage to exclude workers, whereas industrial unions consider it to their advantage to organize extensively."

[20] Seniority rules per se do not necessarily operate to promote discrimination however. For example, Greer notes that the persistence of war-time gains in employment for blacks is partially "...due to union job protection..." op.cit., p. 31.

which organized the least skilled workers in this industry. Second, the preceding analysis can also help explain the rather wide differences between the percentages of blacks in the different unions to be found in Table 2. According to the above arguments, to the extent that the union's racial policy is historically determined it will depend heavily on the extent to which there was black labor available that could be easily substituted for white labor in the union's jurisdiction at the time of initial unionization. In the case of the unions listed in Table 2 it is generally believed that the union's race policy is historically determined, although any original policy is to some extent self-perpetuating because of these unions' formal and informal controls on entry.[21] Column (2) of the table lists the percentage that black unionists were of all unionists in each union in 1967, which we take as an indication of the restrictiveness of the union's racial policy. Column (3) lists the percentage that blacks were of employment in each craft in the first year for which data are available prior to strong unionization of these trades, and the above analysis predicts that these figures will be positively correlated with those in column (2). Indeed, the positive correlation between them (R^2 = .96) is significant at better than the .001 level.[22]

B. Union Effects on Inter-Skill Wage Differentials

Although the espoused policy of many unions is to narrow inter-plant, inter-regional, and inter-skill wage differentials, not very much is known

[21] See Herbert Northrup, op.cit., pp. 17-47.

[22] It is important, of course, to choose a period for the figures in column (3) that pre-dates the advent of strong unionization so that they may be taken as the cause and not the effect of the union's race policy.

TABLE 2

Black Membership in Selected Craft Unions, 1967, and Black Employment in Selected Crafts, 1890

International Union (Short Name)	(1) Total Membership in Referral Units Reporting, 1967	(2) Black Membership as a Percent of Total Membership, 1967	(3) Black Employment as a Percent of Total Employment, 1890
Carpenters	315,538	1.6	3.6
Painters	66,714	3.7	2.0
Bricklayers	34,069	9.6	6.1
Plasterers	28,182	14.0	10.3
Plumbers	147,862	.2	1.1
Electricians	133,904	.6	0
Common Laborers	266,243	30.5	20.0
Sheet Metal Workers	34,867	.2	1.2
Boilermakers and Blacksmiths	23,946	3.9	5.2
Printing Pressmen & Lithographers and Photo Engravers	41,863	3.0	.8
Printing Pressmen	21,710	4.4	N.A.
Lithographers and Photo Engravers	20,153	1.3	N.A.
All Reporting Building Trades	1,257,929	8.4	----
All Reporting Referral Unions	2,028,052	9.7	----

Sources: Columns (1) and (2) are from the U.S. Equal Employment Opportunity Commission, Local Union Report EEO-3. Column (3) is from Report on Population of the United States at the Eleventh Census: 1890, Part II, (Washington, D.C., Government Printing Office, 1897), Table 91 and 95.

about the actual effects of these policies.[23] Since blacks tend to be concentrated in the lower skill classes, larger union wage effects for less skilled than for highly skilled workers will, ceteris paribus, tend to raise the wages of blacks relative to whites. For example, if we denoteby E_{bi} and E_{wi} the fractions of total compensation of the black and white work forces received in the i^{th} occupation, by B_i and W_i the fractions of the respective work forces unionized, and by M_{bi} and M_{wi} the proportionate wage advantages of unionized workers in the black and white work forces, then equation (6) becomes[24]

$$(6a) \quad \Delta = \Sigma E_{bi}B_iM_{bi} - \Sigma E_{wi}W_iM_{wi} \quad .$$

In the absence of discriminatory union race policies we would expect to find $B_i = W_i \equiv U_i$ and $M_{bi} = M_{wi} \equiv M_i$, so that (6a) would become:

$$(6b) \quad \Delta = \Sigma U_iM_i(E_{bi} - E_{wi}) \quad .$$

Given the values of the U_i, the greater the positive correlation between the M_i and the $(E_{bi}-E_{wi})$ the greater the liklihood that $\Delta>0$.[25]

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[23]This is apparently the conclusion of H.G. Lewis on the basis of evidence available through 1963, op.cit., Chapter IX.

[24]This follows by noting that $\ell nR_b = \Sigma E_{bi}\ell nR_{bi}$, $\ell nR_w = \Sigma E_{wi}\ell nR_{wi}$, $\ell nR_b^c = \Sigma E_{bi}\ell nR_{bi}^c$, $\ell nR_w^c = \Sigma E_{wi}\ell nR_{wi}^c$, and then substituting through equations (2)-(6), and the corresponding definitions.

[25]The likely values of the U_i heavily favor the possibility that Δ will be greater than zero even if this correlation is weak among blue collar occupations because the white collar occupations in the U.S. are essentially unorganized while at the same time blacks are virtually absent from them. See Orley Ashenfelter, op.cit.

Line 1 of Table 3 contains a set of estimates of $\ln(1+M_i)$ computed by Frank Stafford for various occupations using data from the Survey of Consumer Finances. These estimates for all workers imply a nearly perfect inverse rank-order correlation between union/nonunion wage effects and skill level. When combined with estimates of the unionization of white workers from Table 5 and estimates of the racial differences in proportionate compensation in Table 6 they imply, using (6b), that in the absence of any offsetting discriminatory union race policies Δ would be approximately .023. A critical part of this calculation, of course, depends heavily on the estimated union wage effects by occupation. It is possible to make some additional estimates of the M_i by occupation from different data sources and these are contained in lines 2 and 3 of Table 3.[26] The estimates in line 3 are undoubtedly the more reliable of the two, but the implied values of Δ = .014 and .013 are virtually identical for both sets. On the basis of presently available evidence, therefore, we conclude that if there have been no offsetting discriminatory effects the effect of unionism on the inter-occupational wage structure has raised

[26]The only other studies of union wage effects that provide information by occupational grouping are those of Hamermesh, Weiss, and Rosen. Hamermesh's ("White Collar Unions, Blue Collar Unions and Wages in Manufacturing," Industrial and Labor Relations Review, January 1971) estimates of an average M_i for male operatives and laborers and an average M_i for male clerical workers are very similar to those in lines 2 and 3 of Table 3, but he does not provide enough detail to calculate a value for Δ. Weiss ("Concentration and Labor Earnings: Reply," American Economic Review, March 1968, pp. 181-184) provides estimates of what he calls a "percentage income advantage of workers in industries with high collective bargaining coverage over those in industries with low collective bargaining coverage" for several occupations, but these cannot be interpreted as estimates of the M_i because they depend on the (arbitrary) levels of "collective bargaining coverage" that are called "high" and/or "low." Rosen ("Unionism and the Occupational Wage Structure in the United States," International Economic Review, June 1970, pp. 269-286) does interpret his results as providing estimates of the M_i, but these seem to vary quite substantially. His estimates of the M_i, for craftsmen, operatives, and laborers vary from .60, .10, and 1.48 (Ibid., Table 3, line 1), respectively to .22, .25, and .90 (Ibid., Table 3, line 8), implying Δ = .025 and .032 for the two alternative sets.

Table 3

Estimated Value of M_i (in natural logarithms) for Male Workers for:

ional	Managerial Workers	Clerical Workers	Sales Workers	Craftsmen	Operatives	Laborers	Service Workers	Estimate of △ All Workers
-.08		.17	.17	.22	.23	.42		.023
				.12	.17	.17	.16	.014
.123 (.046)	-.009 (.050)	.025 (.041)	-.008 (.064)	.102 (.020)	.150 (.019)	.225 (.040)	.034 (.050)	.013 (.0026)

k Stafford, "Concentration and Labor Earnings: Comment," The American Economic Review, March 1968, pp. 174-181. The uted using the data from 15 of the Bureau of Labor Statistics industry wage surveys taken between 1960 and 1965. A only if union and nonunion wage rates were classified by detailed occupation and establishment size. Union/nonunion d for each detailed occupation and then regressed on a set of industry, establishment, and occupational dummy variables, tegories in Table 3 were used to define the latter. Average values of the industry and establishment variables were on in order to compute the average differentials by occupation listed in line (2). The industries were the following aints, Wood Furnishings, Work Clothing, Men's Shirts, Textile Dyeing, Industrial Chemicals, Leather Tanning, Structural involved approximately 500 union/nonunion comparisons. For some evidence using similar data see Vernon T. Clover, nion Plants, 1960-1965," Industrial and Labor Relations Review, January 1968, pp. 226-233. The results in line (3) rce, and using the same methods, as those in Table 4.

the average black/white wage ratio relative to the black/white wage ratio in nonunion labor markets.

C. Craft versus Industrial Unionism

As the above discussion indicates, it is not clear on the basis of currently available evidence what aggregate effect unionism has had on the wages of blacks relative to whites. Nevertheless, the above discussion does suggest one important hypothesis. It suggests that industrial unions are likely to be less discriminatory (more egalitarian) than craft unions.[27] First, the fraction of blacks in the jurisdictions of industrial unions both prior and subsequent to unionization has typically been much larger than in the case of craft unions.[28] As we have seen, this generally implies a more egalitarian race policy. Second, craft unions tend to have greater control of the supply of labor and the hiring process than do industrial unions, and this also will tend to make them more discriminatory. Finally, what evidence there is available suggests that the differential effect of craft versus industrial unionism on the narrowing of wage differentials may tend to reinforce the hypothesis that the former will

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[27] As is well known the terms "craft" and "industrial" as applied in this context are not strictly appropriate. A term better than craft union might be "referral" union, so as to appropriately signify that the union typically has some connection with the hiring process.

[28] Compare, for example, the 13.3 percent of total workers who were black in basic steel in 1930 (just prior to unionization) to the 1.1 percent of plumbers who were black in 1890. See Northrup, op.cit., and the references therein for other examples.

have a more discriminatory (less egalitarian) effect on the ratio of Negro to White wages. This evidence suggests that although industrial unionism may have reduced intra-industry wage inequality, craft unionism may actually have increased intra-industry wage inequality.[29]

II. Empirical Results

We propose to estimate the effect of unionism on the wages of black workers relative to white workers using a large microeconomic data set from the 1967 Survey of Economic Opportunity. Since it is important to obtain estimates of conceptually similar parameters from more than one body of data, we have also obtained estimates of these effects from one set of inter-industrial and several sets of inter-state cross-sectional data derived from the U.S. Censuses of Population.

A. Microeconomic Data

The equation we would like to estimate for black workers is obtained by replacing ℓnR_b^c in (3) with a linear stochastic function of its determinants, $X'\alpha+\mu_U$, and writing for the j^{th} person:

$$(3a) \quad \ell nR_{bj} = X_j'\alpha + \ell n(1+\gamma_b)B_j + \varepsilon_j \ .$$

X_j' is a (row) vector of variables that determine the wage in the absence

[29] After summarizing that evidence, H.G. Lewis concludes that unionism may have reduced wage inequality within "...some industries producing for a national market whose wage-earners are highly organized by industrial unions." On the other hand, he concludes that "...it is by no means obvious that unionism has reduced, rather than increased relative wage inequality within the air transportation, ... barbering, printing and publishing, and entertainment industries," all of which are organized along narrow craft lines. See H.G. Lewis, op.cit., pp. 293-4.

of unionism and α is a vector of parameters. For an individual, $B_j = 1.0$ if the person belongs to a union and $B_j = 0.0$ if the person does not. $\ell n(1+M_b) \tilde{\approx} M_b$ is the (constant) proportionate union/nonunion wage differential, and

$$\varepsilon_j = u_j + \ell n(1+D_{bj}) \approx u_j + D_{bj}$$

is a disturbance term that we assume is uncorrelated with B_j and X_j. There is no reason, of course, to assume that M_b is a constant. A straightforward way to relax this assumption is to assume that

$$(7) \quad M_{bj} = \sum_i M_{bi} V_{bij} + \delta_j$$

where the V_{bi} are a set of mutually exclusive occupation or occupation-by-industry dummy variables taking on the value 1.0 if a person is in a particular category and 0.0 otherwise, M_{bi} is the proportionate union/nonunion wage differential in the i^{th} category, and δ_j is a disturbance term with $E(\delta_j) = 0$. Substitution of (7) into (3a) gives

$$(3b) \quad \ell n R_{bj} = X_j'\alpha + \sum_i M_{bi} V_{bij} B_j + \varepsilon_j' ,$$

with $\varepsilon_j' = \varepsilon_j + \delta_j B_j$.[30] Equation (3b) says simply that we should introduce into the regression the product of B_j and any dummy variable V_{bij} for a

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[30] Note that ε_j' is uncorrelated with B_j even after the introduction of (7), because $E(\varepsilon_j' B_j) = E(\delta_j B_j^2) = E(\delta_j) = 0.0$ when $B_j = 1.0$ and $E(\varepsilon_j' B_j) = 0.0$ directly when $B_j = 0.0$. Thus ordinary least squares still provides an unbiased estimator for the M_{bi} in (3b).

particular category in order to estimate the union/nonunion wage differential for that category. The analogue of (3b) for white workers is

$$(4b) \quad \ell nR_{wj} = X_j'\beta + \sum_i M_{wi} V_{wij} W_j + \varepsilon_j^* ,$$

where the V_{wi} are dummy variables for occupation-industry categories, the M_{wi} are union/nonunion wage differentials for these categories, and $W_j = 1.0$ if the j^{th} person belongs to a union and 0.0 otherwise.

Estimates of the coefficients M_{bi} and M_{wi} (and their standard errors) are contained in Table 4 on the basis of data from the 1967 Survey of Economic Opportunity. The sample is restricted to urban males for whom an hourly wage was reported in the week of the survey. The hourly wage is estimated by dividing a respondent's estimate of his normal weekly earnings by his estimate of weekly hours, and is no doubt the best data on hourly wages that has ever been available in a survey of this sort. Membership in a union was determined only for workers in the private economy, so that the estimated M_i in Table 4 refer to wage differences between union and nonunion workers in the non-governmental economy only. For the variables in the vector X we have adopted <u>without modification</u> the specification used recently by Ronald Oaxaca for a different purpose. Broadly speaking the variables included refer to education, experience, industry, occupation, health, migration, marital status, city size, and region.[31] The sample of white males contained 8,123 persons and

[31] See Ronald Oaxaca, "Male-Female Wage Differentials in Urban Labor Markets," Working Paper No. 23, Industrial Relations Section, Princeton University, for more detail on the exact form of the regressors used to represent each variable. Estimated coefficients for these variables are not reported here because they are virtually identical to those reported by Oaxaca, but they may be obtained from the author upon request.

the R^2 (explained variance) for the estimated equation (4b) was .43. The sample of black males contained 3,897 persons and the R^2 for the estimated equation (3b) was .46.

Our choice for the number of categories for which to estimate values of the M_i was arbitrarily determined by the occupation-industry categories available and the configuration of data. In particular, the number of unionized workers in the white collar and service occupations is relatively small, so that no effort was made to estimate separate differentials by occupation and industry for this group. For the three blue-collar occupations of craftsman, operative, and laborer we initially estimated values of M_i for the five industry groups: Durable Manufacturing; Nondurable Manufacturing; Transportation, Communications, and Utilities; Construction; and all others. As it turned out, virtually all of the variation in values of M_i by occupation was captured by a simple construction/non-construction dichotomy, however, and these are the results reported in Table 4.[32] As can be seen from the table, for both blacks and whites

[32]For the record, we report the estimated values of the M_{wi} (and their estimated standard errors) for white blue-collar workers by more detailed industry in the following table:

	Occupation		
Industry	Craftsmen	Operatives	Laborers
Construction	.335 (.035)	.365 (.086)	.389 (.075)
Durable Manufacturing	-.015 (.039)	.117 (.034)	.140 (.067)
Nondurable Manufacturing	.036 (.041)	.119 (.025)	.116 (.079)
Transportation, Communication, Utilities	.018 (.043)	.133 (.044)	.200 (.073)
Other Industries	.154 (.052)	.291 (.047)	.259 (.092)

the proportionate union/nonunion wage differentials are between 30 and 40 percent in construction, but uniformly between 0 and 20 percent in non-construction industries. The overall average (percentage) union/nonunion wage differential is 9.7 percent for white males and 20.5 percent for black males.[33]

As can also be seen from Table 4, seven of the eight values of the $M_{bi}-M_{wi}$ estimated for non-construction industries are positive, indicating that union/nonunion wage differentials are greater for black workers than for white workers in these industries. Indeed, the average value of M_{wi} in these industries is $\bar{M}_w = .070$ (with standard error .040) and not significantly different from zero, while $\bar{M}_b = .178$ (with standard error .040) in these industries. Two of the three values of the $M_{bi}-M_{wi}$ estimated for the construction industry, however, are negative, with $\bar{M}_w = .345$ (.050) and $\bar{M}_b = .382$ (.058) for this industry. Since the construction industry is organized along a narrow craft basis, and since most other workers are organized along an industrial basis, these results may be taken as evidence in support of the hypothesis that craft unions are more discriminatory (less egalitarian) than industrial unions.

In order to estimate Δ we require the information on the extent of unionization by race and occupation contained in Table 5 and the estimates of total hourly compensation received by each occupation group in Table 6. The former provides estimates of the B_i and W_i, while the latter

[33]These are weighted averages of the M_{wi} and M_{bi} using the compensation weights in Table 6. These weighted averages are just slightly lower than the estimates one would obtain by simply introducing B_j and W_j as variables (without interactions) in the equations underlying Table 4. See, for example, Oaxaca, op.cit.

Table 4

Estimates of Proportionate (in logs)
Union/Nonunion Wage Differentials by Occupation[a]

	White Workers		Black Workers	
Occupation	Non-Construction	Construction	Non-Construction	Construction
Craftsmen	.027 (.022)	.333 (.035)	.118 (.035)	.416 (.056)
Operatives	.142 (.020)	.362 (.086)	.197 (.023)	.285 (.094)
Laborers	.177 (.044)	.390 (.075)	.274 (.032)	.377 (.049)

	All Industries	All Industries
Professional Workers	.120 (.046)	.282 (.120)
Managerial Workers	.006 (.050)	-.116 (.112)
Clerical Workers	.018 (.041)	.112 (.049)
Sales Workers	-.007 (.064)	.275 (.093)
Service Workers	.034 (.050)	.165 (.038)

[a]Estimated standard errors of estimated coefficients are enclosed in parentheses.

Source: See text.

Table 5

Estimates of the Proportion of Workers Unionized, by Occupation-Industry Group

Occupation	White Workers		Black Workers	
	Non-Construction	Construction	Non-Construction	Construction
Craftsmen	.44	.54	.46	.27
Operatives	.48	.53	.45	.22
Laborers	.31	.28	.32	.35

	All Industries	All Industries
Professional Workers	.11	.16
Managerial Workers	.09	.29
Clerical Workers	.23	.36
Sales Workers	.07	.39
Service Workers	.19	.19

Sources: These data are derived from the 1967 Survey of Economic Opportunity. Since this survey is especially supplemented by a relatively unique sampling design, estimates of population proportions such as these must be computed by weighting individuals by estimated probabilities of being sampled. See, for example, the discussion in U.S. Bureau of the Census, Current Population Reports, series P-20, No. 216, "Labor Union Membership in 1966." I owe a debt of gratitude to Professor Daniel Saks of Michigan State University for providing me with these calculations during his stay at The Brookings Institution.

Table 6

Estimates of the Proportion of Total Compensation of Private Wage and Salary Workers Received by Occupational Groups

	White Workers		Black Workers	
Occupation	Non-Construction	Construction	Non-Construction	Construction
Craftsmen	.180	.073	.106	.048
Operatives	.208	.010	.325	.013
Laborers	.048	.015	.144	.070

	All Industries	All Industries
Professional Workers	.147	.041
Managerial Workers	.134	.014
Clerical Workers	.065	.062
Sales Workers	.069	.012
Service Workers	.036	.112
Private Household Workers	.001	.001
Farm Workers	.014	.054

Source: These estimates are obtained by weighting employment by mean wage rate for each category and then deflating by the sum of these quantities. Employment estimates and mean wage rates from the 1967 Survey of Economic Opportunity (see the notes to Table 5) and they are available from the author upon request.

Table 7

Estimates of the Effect of Unionism on the Average Wage of White Workers, Black Workers, and Black Workers Relative to White Workers [a]

	White	Black	△
Blue Collar Construction (Males)	.168 (.017)	.118 (.011)	-.050 (.020)
Blue Collar Non-Construction (Males)	.043 (.0063)	.082 (.0071)	.039 (.0095)
White Collar (Males)	.005 (.0021)	.031 (.0071)	.026 (.0074)
Blue Collar Non-Construction White Collar (Males)	.024 (.0031)	.065 (.0052)	.041 (.0061)
All Male Workers	.037 (.0032)	.071 (.0048)	.034 (.0049)
All Female Workers	.018 (.0027)	.0093 (.0030)	-.009 (.004)
Total	.031 (.0024)	.048 (.0032)	.017 (.0026)

[a] Estimated standard errors of estimated coefficients are in parentheses.

Sources: See text. White collar workers are all workers for whom estimates of union/nonunion differentials are given in Table 4 and who are not craftsmen, operatives, or laborers.

provides estimates of the E_{bi} and E_{wi}. These may be inserted into equation (6a) along with the M_{bi} and M_{wi} from Table 4 in order to produce the estimates of the effect of unionization on the average wage of white and black workers[34] in columns (1) and (2) of Table 7 as well as the estimates of Δ in column (3) of that table. As can be seen from the table, $\Delta = -.05$ is significantly negative in the construction industry, which implies (if we may assume $D_b \tilde{\sim} D_w$) that the black/white wage ratio in this industry is 5 percent lower than it would be in the absence of unionism. As can be seen by comparing tables 4 and 5 this results not so much from differences in the M_{bi} and M_{wi} for each occupation as from the very large differences in the extent of unionization of black and white workers in the construction crafts. According to Table 5 a black craftsman in the construction industry is about one-half as likely to belong to a union as is a white craftsman. On the other hand, $\Delta = .039$ is significantly positive in the same (craftsman, operative, laborer) occupations in the non-construction industries. As can be seen from the tables, this does not happen because

[34]The "effect of unionization on the average wage of white workers" is, using the notation of (6a), $\Sigma E_{wi} W_i M_{wi}$. It is the (proportionate) effect of unionism on the average wage of all white workers relative to nonunion white workers. In order to compute the "partial" values of Δ in the first 5 rows of Table 7 we compute the partial sum in (6a) over the relevant range of occupations and divide the results by ΣE_{wi} (or ΣE_{bi}) for that group. For a list of the occupation-industry categories comprising each group see the notes to Table 7.

$B_i > W_i$ in these categories. Indeed, they are virtually identical. Instead, it occurs because the differences $(M_{bi}-M_{wi})$ tend to be positive and because the differences $(E_{bi}-E_{wi})$ tend to be positively correlated with the M_i, so that black workers are disproportionately concentrated in the occupations where union/nonunion wage effects are relatively large. Taken together these results provide strong support for the hypothesis that craft unions are more discriminatory than industrial unions. As can be seen from Table 7, however, the overall effect of unionism in both construction and non-construction industries produces $\Delta = .034$. It is interesting to note that this is significantly above the values of Δ computed in Table 3 on the basis of union effects on inter-skill wage differentials alone. Finally, from the sixth row of Table 7 we observe that $\Delta = -.009$ for the comparison of black and white females.[35] Combining the effects of unionism on male and female wages then gives an overall estimate of $\Delta = .017$.[36]

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[35] $M_b = .072$ (.023) and $M_w = .150$ (.022) for females (with standard errors in parentheses), and $B = .13$, $W = .12$. Estimates of the effect of unionism on wages for males and females are combined using compensation weights of .692 and .308 for whites, respectively, and .625 and .375 for blacks, respectively.

[36] Although it is not our purpose to go into detail on this subject here, the estimates in the fifth and sixth rows of Table 7 may also be used to compute estimates of Δ as between female and male workers. For example, for white workers this is -.019, which implies that the ratio of white female to male average wages is 1.9 percent lower in the presence of unionism than in its absence.

B. Inter-industrial Data

Observed differences between industries or areas in the average wages of black workers relative to white workers will reflect differences in the positions of the relative demand and relative supply functions for black workers.[37] Now the equation we would like to estimate is obtained by averaging over equation (3a) for black workers and its analogue for white workers, and then subtracting the latter from the former to obtain for the K^{th} industry or area:

$$(8) \quad \ell n(R_b/R_w)_k = M_b B_k - M_w W_k + \bar{X}'_{bk}\alpha - \bar{X}'_{wk}\beta + \varepsilon_k ,$$

where B_K and W_K are the extent of unionization of black and white workers in the k^{th} area; and $\bar{X}_{bk}$ and $\bar{X}_{wk}$ are the averages of X for blacks and whites in the k^{th} area. The appropriate interpretation of equation (k) is not as one of the structural (i.e., demand or supply) equations determining the relative wages and relative employment of black labor, but as the reduced form equation determining the relative wages of black labor. That is, (8) registers the effect of unionism on the equilibrium relative wages of black workers after adjustments in both relative supply and relative demand. This implies that the vector X should contain all the exogenous (shift) variables in either the relative supply or relative demand functions. On the other hand, the hypothesis that the supply of labor to an industry is perfectly elastic has been a fruitful one to date.[38]

[37] The original development of the notion of a relative demand function in this context is contained in Becker, op.cit.

[38] This is the so-called "competitive" hypothesis. See Melvin W. Reder, "Wage Differentials: Theory and Measurement," Aspects of Labor Economics (Princeton, N.J.: Princeton University Press, 1962), pp. 257-311.

This suggests treating the supply of black labor and the supply of white labor to an industry as perfectly elastic, which implies that the supply of black labor relative to white labor is also perfectly elastic. It then follows that the vectors $\bar{X}_b$ and $\bar{X}_w$ need only contain those factors that affect the positions of supply curves. We report results using both approaches below.

If data were available on the B_k and W_k by detailed Census of Population industry we could proceed directly to estimation of equation (8). Unfortunately, these data are not available, so that (8) must be replaced by

$$(9) \qquad \ell n(R_b/R_w)_k = \gamma U_k + X_{bk}\alpha - X'_{wk}\beta + \varepsilon'_k \ ,$$

where U_k is the proportion of all employees in the k^{th} industry or area who are unionized. It is natural, therefore, to inquire as to how the ordinary least squares estimator of γ in (9) may be interpreted in terms of the parameters of equation (8). Indeed, it is straightforward to show that:

$$(10) \qquad \hat{\gamma} = \hat{M}_b - \hat{M}_w + r[L_w/L_b(U-W),U]\hat{M}_b + r[(U-W),U]\hat{M}_w$$

where $r[Y,X]$ denotes the regression coefficient of Y on X, and L_b and L_w represent the employment of black and white workers, respectively.[39] Clearly, $\hat{\gamma} = \hat{M}_b - \hat{M}_w$ so that $E(\hat{\gamma}) = M_b - M_w$ only if U_k and W_k are uncorrelated,

[39](10) is obtained by noting that $U_i = (L_{bi}B_i + L_{wi}W_i)/(L_{bi} + L_{wi})$ so that $B_k = [U_k(L_{bk} + L_{wk})/L_{bk}] - [W_kL_{wk}/L_{bk}]$, substituting the latter into (8) and using the standard results on specification error due to omitted variables.

i.e., only if general increases in unionism (U) result in similar increases in the unionization of both white and black workers. In general, therefore, $\hat{\gamma}$ will reflect both $M_b - M_w$ and the extent to which increases in unionism have favored (or discriminated against) black workers. If increased unionization results in an even greater increase in black unionization, then $\hat{\gamma} > \hat{M}_b - \hat{M}_w$, and vice versa. Although we cannot evaluate (10) for the full set of detailed Census of Population industries we can obtain some rough information on its magnitude by using the available information from the 1967 Survey of Economic Opportunity. Table 8 contains estimates of B_k, W_k, L_{bk}, and L_{wk} for fourteen large industry groups. After the appropriate transformations we may compute from these data estimates of the two regression coefficients on the right-hand-side of (10) as follows:

$$r\,[L_w/L_b(U-W),U] = .003$$

$$r\,[(U-W),U] = -.002.$$

If these estimates are not too far amiss they imply that $\hat{\gamma} \approx \hat{M}_b - \hat{M}_w$, which implies that the magnitude of the bias that results from using (9) in place of (8) may not be very serious.

Table 9 contains estimates of equation (9) from 1960 Census of Population data on 136 industries. Rather than try to convert the relative annual earnings data provided by the Census to relative hourly earnings data using the very imperfect measures of annual working time provided by the Census we have simply included the logarithm of relative weeks worked $[\ell n(H_b/H_w)]$ on the right hand side of the estimated equation in lines (1)-(3). A coefficient for this variable that is close to unity implies

TABLE 8

Estimates of the Extent of Unionism and Private Employment by Industry Group, White and Black Males

Industry Group	Extent of Unionization		Employment (in thousands)	
	Black Workers	White Workers	Black Workers	White Workers
Mining	.50	.38	9.0	576.7
Construction	.31	.46	436.5	3,440.5
Durable Manufacturing	.59	.44	807.7	8,672.1
Non-Durable Manufacturing	.37	.34	488.4	4,892.6
Transportation	.67	.60	223.9	1,917.8
Communication	.53	.44	14.2	429.8
Utilities	.31	.44	42.2	564.6
Wholesale Trade	.18	.16	154.8	1,685.0
Retail Trade	.19	.13	539.4	4,797.2
Finance and Insurance	.15	.06	87.6	1,313.5
Business and Repair Services	.21	.15	89.3	888.2
Personal Services	.13	.13	176.3	1,011.4
Entertainment and Recreational Services	.02	.13	40.6	1,346.5
Professional Services	.11	.04	129.8	1,659.6

Sources: The 1967 Survey of Economic Opportunity. See the notes to Table 5.

that the results of estimation using a direct estimate of relative weekly earnings as the dependent variable would be virtually identical. Since this was the result obtained in lines (1)-(3), the results in line (4) reflect the imposition of this constraint. The results in lines (1) and (2) are estimates of equation (9) on the assumption that the relative supply of labor to an industry is perfectly elastic for a given relative quality. The results in lines (3) and (4) are from direct estimation of a reduced form equation, so that they contain the same variables as in lines (1) and (2) as well as variables that may be thought to influence the relative demand for black workers. These variables include measures of the extent of Southern employment, government employment, urban location, establishment size, and an index of the customer contact of the industry's work force, and are all fully indicated in Table 9. A test of the joint null hypothesis that these additional variables have coefficients that are equal to zero gives $\hat{F}(8,118) = 6.7$, which is clearly significant at conventional test levels. We therefore concentrate on the results in line (4) that include these variables. As is well known, the coefficient of $(E_b - E_w)$ is an estimate of the rate of return to schooling for white workers (say, r_w), while the coefficient of E_b is an estimate of the difference between the rates of return on schooling of white and black workers (say, $r_w - r_b$).[40] The former is estimated at around $\hat{r}_w = .13$ while the latter is $\hat{r}_b - \hat{r}_w = -.06$ and clearly significantly different from zero.

[40] See Jacob Mincer, "The Distribution of Labor Incomes: A Survey with Special Reference to the Human Capital Approach," The Journal of Economic Literature, March 1970, pp. 1-26, and Thomas Johnson, "Returns from Investment in Human Capital," The American Economic Review, September 1970, pp. 546-560.

Table 9

Estimates of Equation (7)
for 136 Census of Population Industries

Estimated Coefficients (and Estimated Standard Errors) of:

Line No.	Constant	$\ln(H_B/H_W)$	E_b-E_w	E_b	X_b	X_b^2	X_w	X_w^2	U	DXU	S_b-S_w	S_b	G_b-G_w	G_b	A_b-A_w	A_b	Z	C	R^2	SEE
1	-.392	1.062	.156	-.034	.059	$-.081 \times 10^{-2}$	-.022	$-.052 \times 10^{-3}$	.295										.545	.156
	(.498)	(.315)	(.022)	(.012)	(.030)	$(.059 \times 10^{-2})$	(.038)	$(.776 \times 10^{-3})$	(.067)											
2	-.086	1.087	.153	-.033	.051	$-.064 \times 10^{-2}$	-.041	$.032 \times 10^{-2}$	.331	-.205									.556	.155
	(.523)	(.313)	(.022)	(.012)	(.030)	$(.059 \times 10^{-2})$	(.040)	$(.080 \times 10^{-2})$	(.070)	(.116)										
3	.699	1.031	.130	-.063	.040	$-.052 \times 10^{-2}$	-.07	$.108 \times 10^{-2}$	.206	-.197	.106	-.201	-.508	.372	.259	.064	.131	-.115	.696	.126
	(.467)	(.282)	(.020)	(.013)	(.025)	$(.050 \times 10^{-2})$	(.033)	$(.068 \times 10^{-2})$	(.080)	(.098)	(.132)	(.108)	(.385)	(.061)	(.216)	(.132)	(.056)	(.084)		
4	.689		.131	-.063	.041	$-.053 \times 10^{-2}$	-.077	$.107 \times 10^{-2}$	.204	-.196	.108	-.201	-.501	.372	.253	.063	.132	-.116	.696	.126
	(.456)		(.018)	(.013)	(.024)	$(.048 \times 10^{-2})$	(.033)	$(.066 \times 10^{-2})$	(.076)	(.097)	(.130)	(.108)	(.377)	(.060)	(.207)	(.131)	(.055)	(.083)		

Definition of Variables: The subscripts b and w indicate whether a variable refers to the black or white work forces in an industry and the absence of both indicates that it refers to the total. The variables are: H, mean weeks worked in 1959; E, mean years of schooling completed; X = Ag-E-6, where Ag is the mean age of workers; U, the proportion of employees unionized; S, the proportion of workers in the South; G, the proportion of workers employed by government; A, the proportion of workers in urban areas; Z, the proportion of workers in establishments with 250 or more workers; C, the proportion of workers in the sales or clerical occupations.

Sources: The variables Z and U are available in Victor Fuchs, The Service Economy, (New York, 1968), Appendix I, the others are derived from various reports of the 1960 Census of Population. C is from Final Report PC(2) - 7A, Occupational Characteristics. Values of E, Ag, H and the dependent variable were computed from the data in Final Report PC(2)-7F, Industrial Characteristics, as were G and A. S was computed from unpublished regional tables comparable to those in the preceding report, and kindly provided by the Bureau of the Census. The dependent variable, mean annual earnings in 1959, was also computed from data in Industrial Characteristics, but the computational procedures were relatively complex. A copy of these procedures and all of the data may be obtained from the author upon request.

Both of these results are consistent with the available estimates of other researchers for this period.[41] Likewise, the coefficients of X_b and $-X_w$ may be taken as estimates of the rate of return to on-the-job training multiplied by the average time-equivalent fraction of earnings initially devoted to such training. These estimates are ,04 and .08 for blacks and whites respectively and also appear similar to those of others.[42] The coefficients of the other variables in line (4) imply lower relative wages for black workers in the South and in industries with extensive customer contact, while they imply higher relative wages for black workers in the government and in industries with large establishments. Estimates of most of these coefficients are somewhat imprecise, however, as judged by estimated standard errors.

Our procedure for handling the craft versus industrial unionism hypothesis is the relatively crude one of assigning a dummy variable (D_k) with value one in the craft-dominated industries and zero in all others, and then entering the product $U_k XD_k$ into the regression.[43] As can be seen

[41] See, for example, Giora Hanoch, "An Economic Analysis of Schooling and Earnings," The Journal of Human Resources, Summer 1967, pp. 310-329, and Jacob Mincer, Schooling, Age, and Earnings, (mimeo.) 1970.

[42] See, particularly Mincer, ibid., especially pp. 42-50. We add in passing that on this interpretation the coefficients of X_b^2 and $-X_w^2$ should equal the negative of the coefficients of X_b and $-X_w$ multiplied by twice the length of the average man's working life. Taking the latter as 40, we then have .041 compared with $(-80X.053X10^{-2}) = .042$ and .077 compared with $(-80X.107X10^{-2}) = .086$, both of which seem comfortably close.

[43] The craft-dominated industries were chosen entirely prior to estimation and essentially on the advice of Professor Albert Rees, to whom I am indebted, but who should not--of course--be held responsible for the results. The eight detailed Census industries chosen were: construction, newspapers, printing excluding newspapers, railroad transportation, water transportation, air transportation, radio and television broadcasting, and motion pictures and theaters.

from the table the estimated value of $\overline{M}_b - \overline{M}_w$ in the industrial union sector is .20, while in the craft-dominated sector it is .01. The former is clearly significantly different from zero on the relevant two tailed test and also significantly different from the latter on the relevant one-tailed test. Comparing these estimates with the estimates in the preceding section based on microeconomic data we have .20 versus .11 and .01 versus .04. Although the former difference is uncomfortably large it is within the range of sampling error associated with these estimates. Finally, since $B \approx W$ in the industrial union sector we may estimate $\Delta \approx U(\overline{M}_b - \overline{M}_w) = .06$ for this sector as compared with an estimate of .04 from the previous section. For the craft-dominated sector $B \neq W$, so that the estimate of Δ depends on the difference B-W. Taking B-W = -.15 for the construction industry from Table 8 we have $\Delta = B(\overline{M}_b - \overline{M}_w) - .15\overline{M}_w = B(.01) - .15\overline{M}_w \approx -.15\overline{M}_w$. If we accept $\overline{M}_w = .35$ from Table 4 we have $\Delta \approx -.05$ for the craft-dominated sector which is identical to the estimate in the previous section.

C. Inter-state Data

Table 10 contains the results of fitting regression equations to several sets of inter-state data. Underlying each equation is a maintained specification we have adopted without modification from a study by William Landes of the effect of state fair employment laws on the relative earnings of non-white workers, (see Table 10). Adopting Landes' framework has two advantages for our purposes: First, simply adding a unionization

variable to Landes' specification allows no pre-testing of the data, and may be more convincing as a test of an a priori hypothesis. Second, Landes has very carefully constructed the requisite data for estimating these equations.

For 1960 and 1950 measures of relative earnings are available and are used as dependent variables. For 1960, 1950, and 1940 there are data available on the relative occupational position of non-whites and these are also used as dependent variables. The occupational position of a group is by now a well known measure and is calculated as a weighted sum of the fraction of a group's workers in each occupation, where the weights are the earnings of all workers in the occupation. Since the occupational categories involved are very broad, and since we would expect unionism to have a larger effect within than between occupations, estimated unionism coefficients from these latter data should be smaller than from the relative earnings data. Finally, one would expect the disturbance terms in all five of these equations to be positively correlated since any tendency for there to be higher or lower relative earnings in a given state than one would predict using the observable independent variables is likely to change very slowly over time. Hence in lines (3)-(7) we report the results of estimating all five equations jointly using Zellner's efficient two stage Aitken (TSA) estimator.[44]

[44] See Arnold Zellner, "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias," Journal of the American Statistical Association, June 1962, pp. 348-368. Interestingly enough, of the ten correlation coefficients between the disturbances of the five equations all ten were positive, as expected.

Line (1) of Table 10 gives Landes' original results for 1960, and he has discussed them fully so that there is no need to replicate that discussion here. Line (2) contains the same equation with a unionism variable (using Troy's data for 1953) added. The estimated coefficient of this variable is .17 and significantly different from zero at the .05 level. Since the dependent variable in this equation is R_{bk}/R_{wk} rather than its logarithm it is necessary to convert this coefficient into an estimate of γ by dividing it by, say, the mean of (R_{bk}/R_{wk}). This gives $\hat{\gamma}$=.28which is slightly but not significantly larger than the estimates in the previous two sections. Line (3) contains the TSA estimates for 1960 using what may be a better unionism variable (an average of the 1964 BLS data and Troy's 1953 data). This gives a very slightly lower value for γ.[45] Line (4) provides TSA estimates for 1950 and an estimated unionism coefficient of .21 that is significantly different from zero and implies γ =.35, somewhat larger than the estimate for 1960. Indeed, as can be seen from lines (5)-(7) the estimated values of the unionism coefficient using relative occupational position data also decline monotonically over time, from a high of .26 in 1940, to .12 in 1950, to a low of .07 in 1960. This suggests that unionized labor markets were significantly less discriminatory relative to non-union labor markets in 1940 than they were in 1950 or 1960.

[45]Although most of the estimated coefficients of the other variables in these equations do not change much from what Landes has estimated, the one notable exception is the coefficient of the dummy variable representing the presence of state Fair Employment Laws, which declines so much (even though its standard error decreases) that it would no longer be judged significantly different from zero at conventional test levels. Nevertheless, the estimated coefficient of this variable is still so big that Landes' basic point that Negro benefits from such laws are very large relative to their costs surely remains correct. For example, Landes estimates the money benefit/cost ratio of these laws at 35, and a calculation using the estimates in Table 10 would still leave this ratio very high.

TABLE 10

Effect of Unionism and Other Variables on the Earnings and Occupational Position of Non-white Male Workers Relative to White Male Workers, Inter-State Data, 1960, 1950, and 1940.

Line No.	Dependent Variable	Year	Estimating Procedure	Estimated Coefficients of a/ b/								R^2
				Constant	L_n/L_w	S	Ur	Ua	T	F	Unionism	
1	Relative Weekly Earnings	1960	OLS	.719 (.108)	-.444 (.109)	-.072 (.120)	.130 (.026)	-.146 (.056)	-.113 (.024)	.029 (.020)	-----	.854
2	Relative Weekly Earnings	1960	OLS	.698 (.104)	-.427 (.105)	-.071 (.115)	.117 (.026)	-.167 (.055)	-.103 (.024)	.022 (.019)	.171 (.083)	.868
3	Relative Weekly Earnings	1960	TSA	.701 (.094)	-.425 (.095)	-.072 (.104)	.114 (.024)	-.163 (.051)	-.105 (.021)	.021 (.017)	.171 (.079)	.868
4	Relative Annual Income	1950	TSA	.048 (.101)	.025 (.097)	.525 (.138)	.081 (.028)	-.008 (.061)	-.031 (.027)	-.028 (.023)	.205 (.098)	.752
5	Relative Occupational Position	1960	TSA	.612 (.054)	-.301 (.056)	.258 (.060)	.053 (.014)	-.004 (.003)	-.074 (.013)	.007 (.010)	.072 (.046)	.940
6	Relative Occupational Position	1950	TSA	.590 (.090)	-.273 (.088)	.176 (.119)	.083 (.025)	.008 (.055)	-.029 (.026)	-.009 (.022)	.115 (.088)	.754
7	Relative Occupational Position	1940	TSA	.701 (.063)	-.251 (.063)	.251 (.107)	.034 (.021)	-.214 (.042)	-.086 (.023)	.015 (.021)	.261 (.085)	.845

a/List of Variables: L_n/L_w, the ratio of non-white to white males in the civilian labor force; S, the ratio of mean years of schooling of non-white to white male workers; Ur, proportion of non-white males in urban areas divided by proportion of white males in urban areas; Ua, proportion of all males in urban areas; T, dummy variable taking on the value 1 in Southern states and zero elsewhere; F, dummy variable taking on the value one in states with Fair Employment laws before 1959, and zero elsewhere. The unionism data are estimates by state of the fraction of total employment unionized. In lines (2), (4), and (6) these data refer to 1953; in lines (3) and (5) they are a simple mean of data for 1964 and 1953; in line (7) they are for 1939.

b/Estimated Standard errors of estimated coefficients in parentheses.

TABLE 10 (cont.)

SOURCES: L_n/L_w, S, Ur, Ua, T, and F are from William M. Landes, "The Economics of Fair Employment Laws," The Journal of Political Economy, July/August, 1968, Appendix B, which contains a complete description of data compilation difficulties. I am indebted to Professor Landes for kindly supplying these data. The unionization data for 1939 and 1953 are from Leo Troy, "Distribution of Union Membership among the States 1939 and 1953," Occasional Paper 56, National Bureau of Economic Research, 1957, Table 4; and for 1964 they are from Directory of National and International Labor Unions in the United States 1967, Bulletin No. 1596, Bureau of Labor Statistics, Table 9.

Finally, we have made an admittedly rough effort to test the craft versus industrial unionism hypothesis using these data. Our procedure uses Troy's breakdown of unionization by state by affiliation. In particular, Troy provides by state for 1953 and 1939 the number of union members in unions attached at those dates to the American Federation of Labor (AFL), the Congress of Industrial Organizations (CIO), and not affiliated with either (UNAF). From these data we constructed variables measuring the proportion of the state's employment in unions attached to each group and entered all three variables into regressions with the same independent variables as in Table 3 so as to estimate separate values of the unionism coefficient (say γ_{AFL}, γ_{CIO}, and γ_{UNAF}) for each group. This can only be considered a rough test of the craft versus industrial unionism hypothesis because: (1) Although the CIO affiliates were all industrial unions and all of the craft or referral unions were AFL affiliates, a large fraction of the AFL affiliates were industrial unions, and (2) the average extent of CIO unionism across states was small, only about one-third of the average extent of AFL unionism. Table 11 contains the five estimated differences $\hat{\gamma}_{CIO} - \hat{\gamma}_{AFL}$ (as well as their estimated standard errors), and all of these are positive as expected.[46] In some cases the estimated differences are very large, but because of the high collinearity among the three separate measures of unionism, estimated coefficient variances are also large. The results do provide additional support, however, for the hypothesis that industrial unions are less discriminatory (more egalitarian) than craft or referal unions.

[46] If all of these estimated differences were statistically independent, then under the null hypothesis that the true $\gamma_{CIO} - \gamma_{AFL} = 0$ we would expect to observe this result with probability less than .05.

TABLE 11

Estimated Differences Between the Effects of CIO and AFL Unionism on the Earnings and Occupational Position of Non-white Male Workers Relative to White Male Workers, 1960, 1950 and 1940.

Dependent Variable	Year	Estimated Coefficient Differences $\hat{\gamma}_{CIO} - \hat{\gamma}_{AFL}$
Relative Weekly Earnings	1960	.064 (.184)
Relative Annual Income	1950	.425 (.228)
Relative Occupational Position	1960	.122 (.109)
Relative Occupational Position	1950	.132 (.224)
Relative Occupational Position	1940	.627 (.224)

III. Concluding Remarks

We have found with several bodies of data that the average wage of black workers relative to the average wage of white workers is consistently higher in unionized than in nonunion labor markets. We have also found that the proportion of black workers who are union members is virtually identical to the proportion of white workers who are union members. This does not imply that most, or indeed any, American trade unions do not discriminate against black workers. Quite to the contrary, there is substantial casual evidence to suggest that virtually all American trade unions do discriminate against black workers. What these results do imply is that there is apparently less discrimination against black workers in the average unionized labor market than in the average nonunion labor market, but not that discrimination is absent from the former. With this limitation in mind the following concluding remarks seem appropriate:

1. We have offered several hypotheses about the way in which unionism may affect the relative wages of black workers both through the effects of explicit racial policies and through effects on skill differentials. The evidence suggests that an important determinant of the former is the fraction of the union's jurisdiction made up of black workers. We also find that in the absence of other factors the latter effects would tend to raise the wages of black workers relative to white workers.

2. On an empirical level we consistently find a higher ratio of black to white wages in labor markets organized by industrial unions than in unorganized labor markets. We also consistently find the ratio

of black to white wages in labor markets organized by craft or "referral" unions differs little from that ratio in unorganized labor markets. At the same time we find that the proportion of black workers who are unionized differs little from the proportion of white workers who are unionized in the industrial union sector, but that the former is about one-half of the latter in the craft union sector. Under certain simplifying assumptions these results taken together imply that the ratio of black to white male wages might have been 4 percent higher in the industrial union sector and five percent lower in the craft union sector than they would have been in the absence of all unionism. The average of these two effects is positive, however, so that the ratio of black to white male wages may have been some 3.4 percent higher in 1967 than it would have been in the absence of unionism. Finally, combining the effect of the presence of unionism on the wages of black males relative to white males with its effect on the wages of black females relative to white females suggests that the ratio of the wages of <u>all</u> black workers relative to <u>all</u> white workers might have been 1.7 percent higher in 1967 than it would have been in the absence of unionism.