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The Economics of Discrimination Thirty Years Later:  
Economists Enter the Courtroom\*

by

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## ABSTRACT

Although The Economics of Discrimination has left a large scholarly legacy, we believe the empirical methods associated with the study of race and sex discrimination have had a still larger impact on practical matters. Our purpose in this paper is to give some small insight into how this scholarly literature has ended up as a major factor in the litigation of many civil disputes where race and sex discrimination are alleged.

Gary Becker's Ph.D. dissertation, subsequently published as The Economics of Discrimination, is all the more remarkable when considered against the political and cultural background of the 1950's. Becker's book was written and published in a period when discrimination against black and women workers was legal in most states. Becker referred extensively to the scholarly literature on discrimination, but, with a couple of exceptions, his was a topic generally reserved for sociologists. Many things changed in the 1960's and the Equal Pay Act of 1963 and the Civil Rights Act of 1964 were both passed by the U.S. Congress. The economics of discrimination became a fashionable topic and as so often happens in our discipline, several theorists attempted to lay claim to the ground that Becker had first staked out.

Becker also initiated the empirical study of the observable economic effects of discrimination: wage and income differences between black and white workers. The published scholarly studies of differences in wage rates between black, female, and other workers became increasingly sophisticated as better and more detailed data became available throughout the 1960's and 1970's. A particularly influential early paper for its clear methodological statement, use of microeconomic data, and detailed study of pay differences due to sex was Ronald Oaxaca's, published in 1973. It seems fair to us to observe that most of these early empirical studies were a response to the combination of new data available and a generally awakened interest in the scholarly study of the economics of discrimination. In particular, their work was not sponsored by government or private parties with a clear stake in its outcome.

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legacy, we believe the empirical methods associated with the study of race and sex discrimination have had a still larger impact on practical matters. Our purpose in this paper is to give some small insight into how this early scholarly literature has ended up as a major factor in the litigation of many civil disputes where race and sex discrimination are alleged. We believe the simple concepts set out in The Economics of Discrimination, coupled with straightforward econometric tools in everyday use, have had a far larger impact on how Title VII (banning employment discrimination) of the 1964 Civil Rights Act is enforced through private litigation than is commonly understood by economists. Of course, whether the legal enforcement of bans on employment discrimination has had any measurable effect on the welfare of black or female workers compared to others is a topic of continued controversy, and we do not attempt to evaluate that issue here. Instead, our purpose is to show by example how economists reasoning about discrimination, and how it might be measured, have come to play a considerable role in the courtroom.

#### I. Economists Define and Measure Discrimination

The most basic idea in The Economics of Discrimination is that market discrimination is defined by a comparison of the wage rates of two groups,  $W$  and  $N$ , (a) as they are actually observed and (b) as they would be observed in the absence of discrimination. For example, if  $W$  and  $N$  are perfect substitutes in production, in the absence of discrimination  $W$  and  $N$  would have the same wage rates. In this case the difference between the wage rates of the two groups  $W$  and  $N$  is a measure of discrimi-

mination.

More generally, if the observed wages of groups W and N are  $\pi_w$  and  $\pi_n$ , and if they would be  $\pi_w^0$  and  $\pi_n^0$  in the absence of discrimination, then the proportionate market discrimination against group N is

$$(1) \quad D = [\pi_w/\pi_n - \pi_w^0/\pi_n^0]/(\pi_w^0/\pi_n^0) \approx \ln(\pi_w/\pi_n) - \ln(\pi_w^0/\pi_n^0) .$$

D is the proportionate shortfall in the N to W wage ratio from what it would be in the absence of discrimination. It is clear that a similar definition of market discrimination is available for any market outcome, whether it be the number employed, hired, or discharged, or some other measure of compensation.

Since the wage ratio  $\pi_w/\pi_n$  is actually observed, implementing this definition of market discrimination is tantamount to specifying an empirical theory of wage determination that would be expected to prevail in the absence of discrimination. As Oaxaca observed, there are two natural alternative ways to do this. Suppose that it is agreed that some characteristics (in a vector) X determine pay in the absence of discrimination. Suppose further that for group W the relationship between the wage,  $\pi_w$ , and these characteristics is of the form

$$(2) \quad \ln\pi_w = \beta_w X + u ,$$

where  $\beta_w$  is an unknown regression coefficient (vector) and u is a disturbance. Proportionate market discrimination is then approximately

$$(3) \quad D \approx \ln(\pi_w/\pi_n) - \beta_w(X_w - X_n),$$

where  $X_n$  and  $X_w$  represent the characteristics of the N's and W's being compared. In this setup discrimination is measured as the difference between the observed proportionate wage difference between N's and W's and the proportionate wage difference that would be expected if N's were paid in the same way (that is, according to the same regression function) as W's. If N's are the group against which discrimination is alleged, it is common, and perhaps most natural, to use this definition of market discrimination. In an analogous way, however, a measure of market discrimination that assumes W's are paid in the same way as N's in the absence of discrimination may also be constructed.

## II. Economists in the Courtroom

Although these definitions of market discrimination have come to be almost commonsense to an economist, to lawyers they are irrelevant and hopelessly complex. For the legal mind, discrimination is above all an action taken by someone to the disadvantage of someone else because of their race or sex. Classic examples of such actions are the maintenance of separate racial lines of progression in a paper products factory, the refusal to hire women for certain blue collar positions, or the maintenance of separate pay scales for black and white workers in similar jobs. These are examples of disparate treatment.

It is not hard to see that the appearance of disparate treatment is easy for an employer to eliminate without making any change in behavior at all. Differential hiring or pay scales may be supported by simply asserting that all hiring and pay is determined by merit, and merit is

determined by employee supervisors. Who is to say whether employee supervisors really use "merit" in making their decisions? This obvious difficulty has lead the courts to recognize that some actions may be discriminatory because they have a disparate impact on the employment or compensation of one or more protected race/sex groups.

To most economists the insistence on finding "smoking gun" evidence of discriminatory actions, intent, or motivation seems quite irrelevant to determining whether market discrimination exists. In crude terms, for economists evidence of discrimination merely requires the presence of "unexplained" differences in compensation or employment. In practice, the economists view has made considerable headway in the courts. This development has proceeded through a slow accretion of decisions that have placed more and more reliance on econometric methods in the determination of whether there is evidence of discrimination. The methods now presented to the courts look remarkably similar to the kind of studies that once appeared in the journals.

It is easy to see how a lawyer would object to the economists procedures. First, note that even if it is agreed what factors (X) determine pay, equation (2) indicates that there are some unobserved factors (u) too. Even assuming the u's are uncorrelated with the X's and distributed identically for N's and W's, there is always a chance that the estimate of D ( $\hat{D} = \ln(\pi_w/\pi_n) - \hat{\beta}_w(X_w - X_n)$ ) will be substantial because of sampling error alone. So long as the equation (2) does not fit perfectly, how can an economist say with certainty that  $\hat{D}$  is not entirely a result of the chance configuration of the u's?

The answer to this question is, of course, that no such guarantee can be made.  $\hat{D}$  has some sampling distribution and, as with ordinary econometric studies, only probability statements about the presence or absence of discrimination are possible.

In 1976 the Supreme Court started the move toward the use of the concept of statistical evidence in its decision in Castaneda v. Partida. The Castaneda v. Partida case involved the question of whether the grand jury selections in Hidalgo County, Texas systematically underrepresented Hispanic-Americans. The important feature of this decision is that no convincing anecdotal evidence demonstrating the intent to discriminate was presented. Yet the court concluded that since grand jury selection was not by random device (which is used in the Federal Courts), the purely statistical evidence alone was sufficient to require rebuttal by the state.

It is very interesting to read how the court reached the conclusion that the statistical disparity was enough "proof." In a long footnote the court presents a calculation that indicates the difference between the actual number of hispanic grand jurors serving in Hidalgo County in an 11-year period and the "expected" number of hispanic grand jurors that would have served if there had been no discrimination. The expected number of hispanic grand jurors is calculated by assuming that in the absence of discrimination hispanic jurors would be drawn in proportion to their representation in the population. This formulation is, of course, precisely that of an economist using equation (1) to define discrimination and using as equation (2) a model with a binomially distributed error term ( $u$ ). Despite what some commentators have tried to suggest, the court did not



adopt a level of statistical significance for determining what constitutes "proof". Instead, the court stated (p. 512, fn. 17):

As a general rule for such large samples, if the difference between the expected value and the observed number is greater than two or three standard deviations, then the hypothesis that the jury drawing was random would be suspect to a social scientist.

The Court then proceeded to show that the difference between the actual and expected number of hispanic grand jurors in this case was significantly different from zero at the 1 in  $10^{140}$  level. The court concluded that "the proof in this case was enough . . . (p. 512)"

The key part of the Casteneda case is the explicit recognition that the presence of an error term in equation (2) does not automatically rule out the use of the econometric approach. Instead, using the econometric approach recognizes that, as always, little or nothing in life is certain, and risks must be taken. In a series of subsequent decisions this basic idea has been elaborated to the point where evidence from stochastic models is now a regular feature in many different parts of the law, but especially in the analysis of discrimination.

A second objection to the economist's procedure is more subtle. Since there are omitted factors determining pay according to equation (2), what guarantees can be made that these factors are uncorrelated with a worker's race or sex? Might not omitted variable bias produce a finding

that  $\hat{D}$  is significantly different from zero when a properly specified version of equation (2) would not?

The answer to this question is, of course, that no economist can make the appropriate guarantee that there is no specification error in (2). Instead, the analysis will be more or less convincing according to (a) how much is well documented in general about models of the determination of pay and (b) how well the particular study is documented and how complete it is. In other words, an economist will be more or less convinced by the findings of a particular non-experimental study according to how well it is done!

Much to the surprise of some, the Supreme Court has very recently expressed much the same view. In the case of Bazemore et al. v. William Friday, et al., decided in July 1986, black workers in the North Carolina Extension Service alleged discrimination in pay that had begun before the Civil Rights Act of 1964 was extended to cover government workers (in 1972) and continued thereafter. The two lower Courts had refused to accept regression studies offered by the black Extension Service workers to establish evidence of discrimination on the grounds that an appropriate regression analysis should include all measurable variables. The Supreme Court found this decision to be in error and provided the following more general guidance (p. 331):

. . . it is clear that a regression analysis that includes less than 'all measurable variables' may serve to prove a plaintiff's case. . . . Whether, in fact, such a regression analysis does carry the plaintiffs' ultimate burden will

depend in a given case on the factual context of each case in light of all the evidence presented by both the plaintiff and the defendant. . . .

It would be difficult to provide a more concrete description of the way economists set about drawing their own conclusions in the give and take of the typical seminar.

A final legal objection to the use of the economists measure of discrimination is that it need not reflect "actions" taken during the period when discrimination is "illegal." For example, suppose that  $\hat{D}$  is measured when discrimination is "legal" in period  $t-1$  as  $\hat{D}_{t-1}$ . Suppose also that  $\hat{D}$  is measured again in period  $t$ , when it is "illegal," as  $\hat{D}_t$ . Suppose further that  $\hat{D}_{t-1} = \hat{D}_t$ . To many lawyers the finding that  $\hat{D}_{t-1} = \hat{D}_t$  means that any discriminatory "acts" that lead to  $\hat{D} \neq 0$  must have occurred during the time when discrimination was legal. Therefore, it is argued, the finding  $\hat{D}_t \neq 0$  does not imply "current" discrimination.

To economists this discussion seems completely to miss the point. Since  $D \neq 0$  is defined by equation (1) to be the presence of discrimination, for an economist the finding  $\hat{D}_{t-1} = \hat{D}_t \neq 0$  implies there was discrimination when it was legal and that this discrimination continues during the period when it is illegal!

Until the Bazemore decision of July 1986 the legal community was completely divided on how this issue should be resolved. In the Bazemore case the lower Courts found that before 1965 the North Carolina "Extension Service maintained two separate, racially segregated branches and paid

black employees less than white employees." The Court of Appeals further acknowledged that the Extension Service had not eliminated all pay disparities in subsequent, actionable years, but claimed that it was not the employers duty under the law to do so. The Supreme Court's decision stated (p. 328):

The error of the Court of Appeals with respect to salary disparities created prior to 1972 and perpetuated thereafter is too obvious to warrant extended discussion: that the Extension Service discriminated with respect to salaries prior to the time it was covered by Title VII does not excuse perpetuating that discrimination after the Extension Service became covered by Title VII. To hold otherwise would have the effect of exempting from liability those employers who were historically the greatest offenders of the rights of blacks.

This decision is, of course, equivalent to applying the economists definition of market discrimination to the factual findings of the Bazemore case.

There are many further applications of the economist's methods that could also be incorporated into the settlement of disputes over allegations of discrimination. For example, once a class of plaintiffs has prevailed in a discrimination suit and established a legitimate claim of discrimination, it is necessary to establish the compensatory damages owed to this "class." A common approach is to set aside a sum \$K , and then to hold numerous mini-trials to determine how these funds should be allocated to

the individual members of the class. The legal costs associated with this procedure are usually substantial.

An obvious and far less expensive alternative procedure is suggested by the economist's approach. Assuming that the presence of discrimination has not altered the compensation that  $W$ 's received (an assumption that Title VII of the 1964 Civil Rights Act maintains by requiring that no worker's pay be reduced to eliminate the presence of discrimination) implies that  $(1 + \hat{D})\pi_n$  multiplied times the number of  $N$  workers is a natural measure of the "backpay" owed to  $N$ 's. There remains the issue of how these funds are to be allocated among the individual class members. A natural procedure is to assign payments by predicting from (2) the salary that each class member would otherwise have received and then to assign the difference between each class member's predicted and actual salary as the compensatory award. There are problems with this approach, however, because it will assign some individuals negative awards when their actual pay is higher than their predicted pay. The simple procedure of assigning awards only where they are positive is no remedy to this defect because such a procedure will produce an estimate of total compensatory damages greater than the estimate of discrimination in (3). The precise implementation of these procedures is, therefore, still a matter where alternative schemes deserve exploration. In view of the cost of alternative procedures, however, we believe these issues will also eventually be resolved.

### III. Conclusion

Although written some thirty years ago, the underlying framework in The Economics of Discrimination, coupled with some simple, modern econometric methods, has become the standard form by which the litigation of disputes over allegations of race and sex discrimination are resolved. It is easy for economists to understate the magnitude of this accomplishment. After all, the setup in The Economics of Discrimination seems to an economist approaching it today almost like commonsense. To the legal profession, however, the definition of market discrimination in Becker's book is far from natural. This is surely a testament to the power and simplicity of the ideas in The Economics of Discrimination.

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