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ECONOMIC AND STATISTICAL ANALYSIS OF DISCRIMINATION IN HIRING

Ronald G. Ehrenberg

Robert S. Smith

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Professor of Economics and Labor Economics, Cornell University, and Research Associate, National Bureau of Economic Research, and Professor of Labor Economics, Cornell University, respectively.
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ABSTRACT

Legal and administrative determinations of employers' compliance with "equal employment opportunity" (EEO) requirements often hinge on the issue of the availability of protected class members to employers. That is, courts and affirmative action review agencies compare the hire rates of protected class members (the ratio of the number of protected class members hired to the number who applied or who were potentially available) to the comparable ratio for other applicants, in assessing whether an employer's hiring policies meet the standards required of them by equal opportunity regulations. The purpose of this paper is to review what economic theory suggests affects availability and to analyze the extent to which these factors are considered in administrative or judicial decisions concerning hiring policies. In our analyses, we point out areas where there seem to be inconsistencies or unresolved issues.

Ronald G. Ehrenberg
Robert S. Smith
Department of Labor Economics
Cornell University
Ithaca, NY 14853
(607) 256-3026

I. Introduction

Legal and administrative determinations of employers' compliance with "equal employment opportunity" (EEO) requirements often hinge on the issue of the availability of protected class members to employers. That is, courts and affirmative action review agencies compare the hire rates of protected class members (the ratio of the number of protected class members hired to the number who applied or who were potentially available) to the comparable ratio for other applicants, in assessing whether an employer's hiring policies meet the standards required of them by equal opportunity regulations. The purpose of this paper is to review what economic theory suggests affects availability and to analyze the extent to which these factors are considered in administrative or judicial decisions concerning hiring policies. In our analyses, we will point out areas where there seem to be inconsistencies or unresolved issues.

II. An Economic Model of Availability

As a rough approximation, once individuals have decided to seek work for pay, the characteristics of the ultimate employee-job "match" will be influenced by both employee behavior and employer policies. Below, we discuss these influences as they pertain to the issue of availability.

A. Human Capital Decisions

Searching and/or training for a job often entail an investment by the employee associated with schooling, with on-the-job training that initially is paid for by lower wages, with a geographical move, or with the costs of quitting one job and looking for another. These investment costs represent barriers to occupational and geographical mobility, but not insurmountable ones in most cases. Workers will change occupations, domiciles and employers

if the expected long-term gains are large enough to outweigh the initial transactions costs.

Human capital theory has two major implications for the calculation of "availability." First, not all of the protected class workers who consider themselves in a given occupation are equally available to an employer seeking employees to fill that job. The pecuniary and psychic costs of making geographic changes appear to rise with distance, so that in "national" or "regional" labor markets not all potential applicants are equally likely to be interested. Persons with working spouses also face higher costs of mobility, other things equal. Likewise, those currently without employment tend to have lower opportunity costs of accepting a given offer than those with a job, and even among the latter group transactions costs will vary with the wage and compensation characteristics of the current job. Finally, the long-term gains from a human capital investment fall with age, so that older workers tend to be less mobile ("available") than younger workers. Because the age distribution of the labor force varies by race and sex, the proportions of the labor force actually "available" in a labor market probably differ by race and sex.

Second, those not currently "in" the labor market from which a firm is hiring may be induced to join if the net returns are high enough. Employers normally hiring only those workers in the local area can induce workers to move in from other areas if their compensation offers are sufficiently high. Similarly, workers will change occupations when the long-run net benefits are large enough. Thus, the concept of a particular occupational/geographic "labor market" containing a fixed number of workers is a simplification that ignores mobility among workers.

B. Employer Policies

Participation and human capital decisions are usually modelled in terms of general, market incentives -- incentives that are normally beyond the control of one employer. However, an individual employer's policies clearly do affect the number and quality of its applicants, and it is to a brief review of the effects of these policies to which we now turn.

1) Size of Recruiting Area. Firms offering relatively generous compensation packages will attract larger numbers of applicants. The generous compensation will offset high commuting costs for many workers who live far away from the plant and tend to enlarge the geographic size of the firm's recruiting area.

Psychic and pecuniary costs of commuting, however, vary with sex, income level, and distance. Therefore, the geographic radius from which a given plant can draw applicants may differ by race and sex, and the interest of workers in the recruiting area will decline with distance from the plant. The willingness of a firm to pay higher wages depends on its ability to enlarge the number of its applicants and the payoff from doing so. Thus, unskilled jobs where worker selection need not be very careful may have smaller recruiting areas than more skilled jobs in the same plant where stringent screening is required.

2) Applicant Quality. Compensation policies of a firm can also affect the quality of its applicants. At lower compensation levels, only those whose current wages are very low will tend to be "available" to a firm. At higher levels, those available will include workers currently receiving higher wages. Because high wages can be presumed to reflect high productivity, higher wage offers by a firm will tend to attract more applicants of higher

average productivity. The quality-increasing effects of higher wages, however, could be offset by dilution associated with the increased probabilities of attracting more distant applicants. Thus, while the number of high-productivity applicants will rise as wages increase (causing the average quality of successful applicants to rise), it is not possible to assert a priori whether high-quality applicants will form a larger proportion of total applicants.

Another factor affecting the quality of those hired is the recruiting strategy of the firm. Some firms will, as above, offer high wages and select the best from a large number of applicants. Others will offer low starting wages and train previously unqualified new hires for their jobs. Training offered may be general in nature, in which case it is paid for by the employee in the form of low initial wage rates. If training is employer-specific, both employer and employee will tend to share in its costs and agree to a post-training compensation policy that discourages the other from unilaterally severing the employment relationship. Thus "high-training" strategies can substitute for "high wage" policies, with predictable effects on hiring standards, the quality of applicants, wage rates and later mobility.

3) Sex and Race Composition of Applicants. Other aspects of a plant's employment package can affect the sex and race composition of applicants. A reputation for discrimination is one , but beyond that are such things as career ladders, fringe benefit packages, and plant location. Some plants maintain an "internal labor market," where new entrants are initially placed in low-responsibility, low-paying jobs but offered a succession of internal promotions later on. Employers look for qualities beyond the entry-level job, and the employees who find these jobs attractive are those who have a relatively long planning horizon and/or low discount rates. There are likely to be cultural and/or wealth differences by race or sex that

affect planning horizons and/or discount rates--and these factors will in turn influence the proportion of protected class workers who both apply for such jobs and are ultimately hired.

Fringe benefits form an increasing proportion of most compensation packages, and they can subtly affect the race/sex mix of applicants. The fundamental characteristic of fringe benefits is that they are not paid in currently spendable cash; they are in-kind or deferred payments whose primary advantage to an employee is their income tax treatment. Because tax breaks are more valuable for high-income people, fringe benefits are of least value to the poor. Low wage and low-wealth workers will tend to prefer cash; thus, compensation packages that offer high fringe benefits and lower wages will attract fewer minority applicants. Married women, who are perhaps already covered by medical insurance (say), may also be less attracted by compensation packages heavily weighted toward particular fringe benefits.

Finally, the locational decisions of a firm will affect the race and sex composition of its applicants. Locating near pleasant suburban residential areas will tend to attract more women than locating near nonresidential areas. Similarly, locating near minority "ghettoes" will attract more minorities than locating near distant suburbs. Land values, access to transportation and access to customers, as well as the availability of labor, all affect locational decisions.

III. Operationalizing the Conceptual Framework

Given the above framework, it is interesting to ask how the criteria and evidence used in discrimination in hiring cases relate to it. To do so, we trace how the courts have treated a number of issues including the geographic dimensions of a firm's labor market, the pool of potential applicants, and the determination of which applicants or potential applicants

are qualified for particular jobs. The discussion that follows is non-technical in nature; citations to specific legal cases to support our impressions are found in the footnotes (available from us on request). To anticipate, we find that while the courts have moved increasingly towards using criteria and evidence that are consistent with economic and statistical analyses, in some cases they have not moved quite far enough.

A. The Geographic Dimension of a Firm's Labor Market

Early cases arbitrarily specified the extent of a firm's labor market by geographic boundaries, such as a state, SMSA, or county.[1] However, such a broad specification ignores a firm's location within an area; since an individual's willingness to work for a firm depends upon commuting time and costs, where a firm is located will affect its potential labor supply. Moreover, the higher the compensation a firm offers, the greater the distance potential applicants will be willing to commute. Hence, the relevant geographic labor market is a firm-specific concept and depends both on the firm's location and its compensation policy.

Subsequent cases have adopted such a view and defined a firm's labor market by reference to actual commuting patterns of its workforce or applicant pool and/or by reasonable expected commuting patterns.[2] For example, with respect to the former criterion, the numbers of qualified (to be defined below) protected and nonprotected class individuals in each area is sometimes weighted by the fraction of a firm's employees (or applicants) who reside in the area to compute an overall availability rate.[3] With respect to the latter, the weights assigned to each residential area are sometimes assumed to decline monotonically with the distance between the area and the firm.[4]

To date, the courts appear to have overlooked the fact that willingness to commute differs by race and sex. There is much evidence that females tend to live closer to their jobs than males and some evidence that non-whites commute shorter distances than whites.[5] To the extent that these differences reflect voluntary labor supply decisions, this suggests that in computing availability ratios the weights assigned to each residential area might be reasonably expected to differ by gender or race. For example, a function relating the fraction of male applicants from a given residential area to the distance of that area from a firm might start (at 0 distance) lower but extend farther out than the comparable female function.

Other things equal, as we move to more highly skilled and compensated workers, commuting costs become relatively less important and the size of the local labor market expands; a tendency the courts have recognized.[6] However, the courts have been less consistent with economic theory in their treatment of availability in national labor markets, markets for highly skilled professionals where the job search by both employers and potential employees is truly national in scope. To say that a market is national is not to say that a given firm's chances of attracting employees from all areas of the country are equal. For example, professionals raised and trained in the "sunbelt" may have strong nonpecuniary preferences for remaining there rather than moving to a snowbelt state. Moreover, we know that interstate migration rates decline with distance, even for highly skilled professionals. Finally, firms located in isolated small towns may face problems in attracting professionals with career-oriented spouses because the chances of the spouse's finding an acceptable job offer in such a town may be quite low. Court cases that use national availability data for professional employees appear to ignore these considerations.[7]

B. The Pool of Potential Applicants

While the earliest court decisions permitted the use of population representation as an appropriate standard for availability,[8] it was soon realized that population figures included individuals who were not available for work (e.g., the aged, young children, individuals in institutions). Later cases moved to the use of civilian labor force data[9] and, in cases where occupational qualifications could be established, to the use of the qualified civilian labor force.[10]

Although this is clearly movement in the right direction, a number of thorny conceptual issues remain; these all relate to the fact that the stock of qualified individuals in an area is not equal to the flow of potential applicants to a firm. First, the civilian labor force consists both of employed and unemployed workers and, as noted above, the response of each group to job offers is likely to be different. Some work by economists has considered the possibility of using a "reservation wage approach" to compute the number of potential applicants, but it is unclear how the courts will react to this methodology.[11] It is clear, however, that employed and unemployed workers should not be given equal weight in computing availability numbers; since unemployment rates differ by race and sex, to do so would bias availability comparisons.

Next, in computing applicant pools, the focus in court cases is often on the total stock of "qualified" individuals in the labor market. As is well-documented, however, the probability of voluntary turnover declines with age. The focus should more appropriately be on relatively young employed workers in a labor market, with older more experienced workers receiving less weight in the computation of availability. Put another way, the flow of new hires should be contrasted to the flow of potential applicants, not to the stock of existing employees in the labor market. If the

protected class proportion of new entrants exceeds their proportion of all employees (due to increased minority population and female labor force participation rates), the former proportion will lead to higher standards being set for protected class hiring. While it is now routine for universities hiring at the assistant professor level to focus on the share of protected class members in the new Ph.D. pool, it is our impression that in most other cases, older individuals are assumed to be equally "available" to a firm as younger oners.

Finally, a firm's compensation policy may affect the fraction of minorities or females in its potential applicant pool for at least two reasons. On the one hand, if reservation wage functions differ for minorities or females in the applicant pool will vary systematically with a firm's wage policy.[12] On the other hand, holding total compensation fixed, firms that offer high wages but lower fringe benefits may generate--for reasons noted above--more female and minority applicants than those that offer low-wage/high-fringe packages. To date, the courts do not seem to have realized that a nondiscriminating firm's compensation policy may affect the race/sex composition of its potential applicant pool.

C. Which Potential Applicants Are Qualified?

In a number of cases dealing with skilled and semi-skilled workers, the courts have ruled that occupational representation is an appropriate availability standard.[13] In some cases, for example those dealing with teachers, determining who is qualified to be hired is straightforward (employed teachers and other individuals who meet state or local teacher certification requirements). In other cases, however, qualifications are much more nebulous. While some jobs require very specific skills and prior occupational experience, others may require only general age/education/labor market experience

credentials. It is clear that no general guidelines will emerge here.

What about the question of training? While a 1977 General Services Administration document defined availability to include those "...who are capable of acquiring those skills within a reasonable period of time,"[14] we find no evidence that the courts have adopted this position. We believe this to be wise, for one knows from human capital theory that the costs of all general training, and some share of the costs of specific training, must be "borne" by workers if firms are permitted to maximize profits. Hence, if already trained workers were available, firms would hire untrained workers only if the latter were willing to accept lower wages and/or forgo training opportunities. If the protected class workers were disproportionately concentrated among the untrained (rather than the trained), and the courts counted such workers among the available set, then one of three outcomes woulc necessarily occur even in nondiscriminating firms: (1) New hires from the protected class would receive lower rates, on average, than other new hires; (2) the protected class new hires would be more likely than these others to be shunted into dead-end jobs that provide no training opportunities; or (3) firms would be constrained from maximizing profits. Since the first two outcomes might erroneously lead to allegations of discrimination and the third might reduce the number of nondiscriminating employers, none of the three outcomes seems socially desirable.

Finally, given a qualified applicant pool, the courts have agreed that employers have the right to choose the subset of applicants that they consider to be the most qualified.[15] However, it is not sufficient to argue that explicit or implicit hiring standards (e.g., test scores or education levels) are believed to be correlated with subsequent productivity. Rather it must be documented that they are valid predictors for the particular

employer. Put another way, although a variety of economic theories (human capital, screening, neo-Marxian) all suggest that increased education is associated with increased productivity, in the absence of explicit evidence that such an association exists at a particular firm, the courts appear to be unwilling to accept evidence on differences in mean education levels between protected group and other applicants as a justification for differential hire rates between the two groups.[16]

IV. Policy Issues

Hiring employees can be conceived of as a two-step procedure. Applicants are first generated, and then employees are selected from among the applicants. We examine each step below (in reverse order) within the context of legal policy issues.

A. Selection Criteria

The Supreme Court[17] has enunciated the general rule that a plaintiff has made a prima facie case of discrimination by showing that a selection device has a significant disparate impact on race or sex (i.e., the ratio of those passing to those taking the test differs significantly by race or sex). Once a prima facie case of discrimination has been established by the plaintiff, the burden shifts to the defendant to show that the business practice giving rise to the disparate impact grows out of a business necessity. The Supreme Court has also emphasized the validity of inferring discrimination if the overall selection ratios of the firm (those hired divided by those applying) are significantly different by race or sex.[18] The importance of showing disparate outcomes has been a key factor in stimulating the use of statistical methods and economic theory in discrimination cases involving the hiring process.

A statistical issue raised by the disparate impact standard is how to measure the "significance" of any differences in hiring ratios. The courts have considered criteria of statistical significance in some areas, focusing on hire rates being different at the .05 level of significance or being at least two to three standard deviations apart.[19] In other cases, they have considered (but not always accepted) a standard of whether protected class applicant hire rates are at least eighty percent of the hire rate of other applicants.[20]

There are well-known deficiencies with both of these approaches. The focus on statistical significance makes it difficult to prove evidence of disparate impacts in situations where there are a small number of observations, either because an employer has done proportionately little hiring or its workforce is small in size. The "eighty percent" rule is arbitrary and is not grounded in any analytic framework. Nonetheless, it seems clear that the criteria ultimately chosen should involve issues of <u>both</u> statistical and quantitative significance. One senses, for example, that hire rates for a large employer of .49 for minorities and .50 for nonminorities which are statistically significantly different should not be taken as strong evidence of disparate impact.

Given that statistical significance is difficult to infer when samples are small, that arbitrary standards can be disputed, and that a finding of "disparate impact" leads to a finding of discrimination <u>only</u> in cases where selection standards cannot be shown to be job-related, it seems that courts will inevitably be drawn into the issue of judging firms' hiring criteria. It would thus appear difficult for courts to sidestep the evaluation of hiring <u>procedures</u> by looking just at hiring <u>outcomes</u>.

B. Actual vs. Potential Applicant Pools

A firm that appears to apply nondiscriminatory hiring criteria to its applicants may in fact employ methods of recruiting applicants that are discriminatory in intent or effect. For this reason, the courts have sometimes been reluctant to accept a firm's actual applicant flow as the basis for judging the fairness of selection procedures; estimates of the potential applicant flow it faces thus enters the picture.

If data on the actual applicant flow to a firm are available, the courts appear to have concluded that it is preferable to use such data rather than estimates of potential applicant flows, provided that the representation of protected group members in the former is equal to or exceeds their representation in the latter.[21] However, if actual applicant flow data are distorted by application procedures, recruitment practices, or other actions that discourage protected group members from applying, potential applicant flow data may be preferred.[22] This seems to almost reduce to the rule "use the type of applicant flow data that yields the highest representation of protected group members." There are two major flaws with this rule.

First, were "potential availability" accurately estimatable, a standard of actual or potential availability, which ever is higher, would create a goal that cannot be attained in the aggregate. The reason is simple: to the extent that actual availability exceeded expected availability in any firm, the aggregate goal would exceed the number potentially available.

More importantly, however, it seems clear from our review of both theory and evidence that factors affecting the availability of potential applicants to a particular firm can be highly specific. Thus, while estimates of expected availability can be obtained from a careful count and

weighting of various workers in the labor market, a specific firm will usually be able to point to aspects of its training or recruiting policies, compensation packages, or skill needs that make it atypical. It appears to us that comparing actual to potential applicant flows for purposes of finding "disparate impact" will often involve quite legitimate disputes. A logical extension of the judicial standard applying to hiring criteria would seem to involve the following: If a firm's actual applicant flows from protected classes are below those expected, the firm is permitted an attempt to demonstrate that the totality of its recruitment procedures (including its location and its compensation package) serve the purpose of business necessity. Once again, it appears to us impossible for the courts to circumvent the need to judge a firm's policies or procedures by looking only at outcomes.

Unfortunately, court judgments on whether a firm's policies are non-discriminatory presents an issue of profound importance. Suppose two plants are located side-by-side in a suburban location, but one pays a high wage that attracts black applicants from the central city and the other does not. Should a court be permitted to order the lower-wage firm to raise its wage? Should a high-wage firm that attracts white suburban applicants despite being located in the central city be told to reduce its wage to increase the proportion of black applicants? Should courts make similar judgments about a firm's fringe benefit package or its reasons for relocating a plant? Courts are now allowed to make judgments about the business necessity of a firm's hiring criteria, so perhaps a logical extension of this power is judicial intrusion into matters of compensation levels, fringe benefit packages and location policy. It is a step, however, fraught with serious implications for a market system.

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Footnotes

1. See Griggs v. Duke Power Company, 401 U.S. 424 (1971) or Taylor v. Safeway Stores, 524 F.2d 263 (1oc., 1975).

2. On the use of actual commuting patterns, see Detroit Police Officers Assoc. v. Young, 452 U.S. 938 (1981), and Drayton v. City of St. Petersburg, 477 F.Supp. 846 (M.D. Florida 1979). On the use of reasonable expected commuting patterns, see ABROV v. Black and Decker Mfg. Co., 439 F.Supp. 1095 (D. Maryland 1977), and EEOC v. North Hills Passauant Hospital, 466 F.Supp. 783 (W.D. Pa. 1979).

3. See EEOC v. duPont Co., 445 F.Supp. 223 (D. Delaware 1978), Smith v. Union Oil of California, (D. California 1977), Louisville Black Police Officers v. City, 511 F.Supp. 825 (D. Kentucky 1979), Gay v. Waiters Union, Local 30, 489 F.Supp. 282 (N.D. Cal. 1980), and Markey v. Fenneco Oil Co., 635 F.2d 497 (5th Cir. 1981).

4. See, for example, Timkin Co. v. Vaughan, 413 F.Supp. 1183 (N.D. Ohio 1976).

5. For evidence on commuting time differentials by race and sex, see David Ellwood (1983), and the citations included there, and Albert Rees and George Schultz (1970).

6. Barbara Schlei and Paul Grossman (1983), p. 1362.

7. See, for example, Quigley v. Braniff Airways, Inc., 85 F.R.D. 74 (N.D. Tex. 1979). Haber (1981) suggests a methodology that takes spacial mobility patterns into account when computing availability data for national markets, but to our knowledge it has not been adopted for use in actual cases.

8. For example, Teamsters v. United States, 431 U.S. 324 (1977).

9. See, for example, EEOC v. duPont Co., Smith v. Union Oil, Detroit Police Officers Assoc. v. Young, supra, and Reynolds v. Sheet Metal Workers Local 102, 498 F.Supp. 952 (D.D.C. 1980).

10. See, for example, Hazelwood School District v. U.S., 433 U.S. 299 (1977), Croker v. Boeing Co., 437 F.Supp. 1138 (1977), EEOC v. Radiator Specialty Co., 610 F.2d 178 (4th Cir. 1979), and EEOC v. United Virginia Bank, 615 F.2d 147 (4th Cir. 1980).

11. See Donald Atwater and James Sheridan (1980) and Atwater, Richard Niehaus and Sheridan (1981).

12. For evidence on white/nonwhite reservation wage differences for teenagers, see Harr Holzer (1983) and Michael Borus (1982).

13. See the citations in footnote 10.

14. General Services Administration (1977), p. 9.

15. See Griggs v. Duke Power Co., supra.

16. See Green and Danley v. U.S. Steel Corp. Decision by Judge J. Newcomer in the Eastern District of Pennsylvania District Court, July 18, 1983.

17. Griggs v. Duke Power Co., supra, enunciated the standard of "disparate impact".

18. See, for example, Hazelwood School District v. United States, supra, and Teamsters v. United States, supra.

19. See, for example, Contraras v. City of Los Angeles, 656 F.2d 1267 (9th Cir. 1981), Davis v. City of Dallas, 483 F.Supp. 54 (N.D. Texas 1979), Hazelwood School District v. United States, supra, and Rivera v. City of Wichita Falls, 665 F.2d 531 (5th Cir. 1982).

20. See, for example, Eubanks v. Pickens-Bond Construction Co., 635 F.2d 1341 (8th Cir. 1980) where the court rejected the 80% rule because of a small sample size, and Moore v. Southwestern Bell Tel. Co., 593 F.2d 607 (5th Cir. 1979) where the rule was adopted.

21. See, for example, United States v. County of Fairfax, Va., 629 F.2d 1374 (5th Cir. 1974) or New York City Transit Authority v. Beazer, 440 U.S. 568 (1979).

22. See Dothard v. Rawlinson, 433 U.S. 321 (1977).