In many, if not all, employment discrimination lawsuits, both the employer-defendant and the plaintiffs realize that there is a statistical disparity between the protected and nonprotected employee groups at issue in the case. It is the meaning of the statistical disparity that is most frequently the area of contention and subject to differing interpretation by the employer and plaintiffs.

Since the 1970s, employment discrimination attorneys and the courts have relied heavily on the mathematical and probability concept of statistical significance in assessing the underlying importance of an observed statistical disparity in employment conditions between different groups of employees. The concept of statistical significance, which in essence is a method to assess the likelihood that random chance, and therefore not discrimination, produced the given employment disparity is also routinely used by courts to assist them with determining if the underlying statistical employment analysis meets the reliability requirements of Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579 (1993).

While the concept of statistical significance can be helpful for the courts and helps labor economists and statisticians assist juries with understanding the underlying context of a statistical employment disparity, an overreliance on the statistical significance paradigm, especially when it is done at the expense of economic significance, can potentially produce misleading inferences concerning employment discrimination. Economic significance is a well-established concept that takes into account the magnitude and implications of the alleged disparity in employment conditions.

When used in conjunction with the traditional concept of statistical significance the inferences from a given statistical analysis can be quite probative and compelling. In recent years, courts have in fact begun implicitly utilizing both significance paradigms when dealing with statistical evidence in employment cases. This article examines the concept of economic significance and its relevance to statistical evidence in employment discrimination cases.

**Background**

In recent years, the importance of statistical analysis in employment discrimination cases has grown from an analytical tool that was used almost exclusively in class action employment discrimination lawsuits to one that is utilized in many different types of employment causes of actions, including pattern and practice lawsuits and single plaintiff cases. Previously opaque statistical notions, such as the standardized measurement of
statistical significance, are becoming common concepts that attorneys and courts routinely contend with when handling statistical evidence in employment discrimination cases.

A substantial amount of case law has both directly and indirectly contributed to the definition of statistical significance and how experts present statistical employment evidence in employment cases. Generally, when determining if an employment disparity is statistically significant, the courts tend to reduce the assessment to a standard deviation. The number of standard deviations associated with a particular employment disparity tells the court, in terms that are uniform across different types of employment analyses, the statistical likelihood that random chance would have produced a particular employment outcome in the absence of discrimination.

Using both the statistical and economic significance paradigms allows courts to check the reliability of complex data.

Statistical Significance Testing in Employment Discrimination Cases

Employment case law is replete with examples and discussions dealing with issues of statistical significance testing in employment discrimination cases. For many statistical experts in the employment area, the U.S. Supreme Court’s decision in Castenda v. Partida, 430 U.S. 482 (1977), provides one of the more definitive statements on statistical significance testing.

In that case, which dealt with jury discrimination, the court stated that "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 [concerning randomness] would be suspect to a social scientist," 430 U.S. at 496n.17.1

Although the case specifically dealt only with a specific statistic test (the binomial test), labor economists and statisticians have adopted and applied this rule to other types of statistical tests in the employment area. Other courts have made clear statements concerning statistical significance testing in employment discrimination cases. For example, in Lopez v. Laborers, 987 F.2d 1210, 1214 (5th Cir. 1993), the U.S. Court of Appeals for the Fifth Circuit held that the court should not reject chance as the underlying explanatory factor unless the differences are greater than three standard deviations.

Statistically Significant Employment Disparities Are Not Always Economically Significant

The reliance on the statistical significance paradigm in the courts is in some respects at odds with the professional and academic literature in economics, statistics, and the social sciences. Many studies in
The court should not reject chance as the underlying factor unless the differences are greater than 3 standard deviations.

The social sciences suggest that the importance of a particular statistical or empirical result should be viewed not only in terms of statistical significance, but also in terms of economic significance. A standard deviation range of two to three standard deviations approximately means that there is about a 2.5 percent to 0.5 percent chance that a random and unbiased process would have generated the underlying data. The exact range depends on the specific framework of the hypothesis test.

Further reading


Jeffrey M. Wooldridge, Introductory Econometrics, USA; South-Western Publishing Co., 2000. p. 131
