

PERILS OF USING STATISTICS TO SHOW PRESENCE OF ABSENCE OF BIAS

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Why Some Studies to Prove or Disprove Bias Are Flawed

My commentary here on Nov. 18, 1996, was quite critical of the attention given to racial disparities in mortgage rejection rates. My principal point was that those who focus on large racial disparities overlook the statistical tendency of such disparities to be high where overall failure rates are low. Also, the higher the racial disparity in rejection rates, usually the lower the disparity in success rates. For statisticians, the success rate is the standard measure of the discriminatory effect.

I questioned the validity of studies that purported to adjust for differences in income by grouping applicants into broad income categories. On this issue, my main point was that, because minorities tend to be disproportionately concentrated near the lower end of each income group, such studies rarely adequately adjusted for racial differences in income.

Those who maintain that the evidence shows the absence of discrimination exhibit comparable misunderstandings of the data. A number of observers, including Nobel economist Gary Becker, have argued that if discrimination against minority mortgage applicants exists, we would expect minorities to have lower default rates. In other words, minorities seeking mortgages are subjected to higher standards, which would seem to be the essence of discrimination. This would mean minorities whose mortgage applications are approved are more creditworthy than approved whites.

But blacks have been found to have much higher default rates than whites. These observers have thus made the intuitively appealing point that the default rates indicate that blacks have not been discriminated against in lending and suggest that blacks are being favored.

The argument, however, is manifestly flawed. Almost invariably, a group that on average possesses weaker qualifications among persons seeking some benefit or position will also on average possess weaker qualifications among persons receiving the benefit or position, even when there is substantial discrimination against that group. This occurs for the simple reason that the less-qualified group, being disproportionately concentrated among the applicants who have relatively weak qualifications, will tend also be disproportionately concentrated among the selected persons who have relatively weak qualifications.

The pattern can be illustrated by the actual data presented in a major employment discrimination suit tried in the mid-1980s. Women, who were the less-qualified group of applicants in that instance, made up 70% of applicants without prior experience in the type of job at issue and 40% of applicants with experience, but they made up only 20 of 100 hires with experience and 30 of 100 hires without experience.

So even though experienced female applicants were less likely to be hired than experienced males, and inexperienced female applicants were less likely to be hired than inexperienced males, the women who were hired were less likely to have experience than the men who were hired. Only 40% of the 50 women hired had experience compared with 53% of the 150 men hired.

Because of the possibility that other factors may have explained why both among experienced and inexperienced applicants women were less likely to be hired than men, these data may not have conclusively proved discrimination. The data nevertheless demonstrate that women who were hired were less likely to have experience than men who were hired but did not show that women were being favored or even that they were not being discriminated against.

In the same suit, computerized simulations presented by both sides repeatedly demonstrated that when there are substantial differences in the qualifications of the applicants from two different groups, the persons selected from the less-qualified group will have average weaker qualifications than persons selected from the more qualified group, even in the face of pronounced discrimination against the less-qualified group.

The same tendencies operate in the credit context. Since minorities will have weaker average qualifications among mortgage applicants, they will have weaker average qualifications among persons whose applications are granted, even if substantial credit discrimination does exist.

Discrimination against minority applicants may reduce somewhat the tendency for minorities who are granted mortgages to have weaker qualifications than whites granted mortgages, particularly if the discrimination is carried out principally against less creditworthy minority applicants. And, if minorities in fact had lower default rates than whites, it would suggest that discrimination against minorities was very great.

But when minorities have higher default rates than whites, that cannot refute the hypothesis of substantial discrimination against minorities. Indeed, loan officers' awareness that minorities tend to have higher default rates than whites is but another reason for concern that loan officers will be more cautious in appraising the credit histories of minority applicants than those of white applicants.

Is there discrimination against minority loan applicants? I don't really know. But I trust that the debate will continue and it would be better if carried out with a better understanding of fundamental mathematics.