

Efficiency is enhanced if all employees compete on equal terms.

The Benefits of Equal Opportunity

by ANDREW SCHOTTER
and
KEITH WEIGELT

IN THE PUBLIC POLICY debate surrounding the question of equal opportunity laws and affirmative action programs, there is a commonly held belief that a sad trade-off exists between what is considered equitable and what is efficient. For example, it is felt that since corporations must sacrifice performance when they institute an affirmative action program, they are forced to pay for their "good intentions" with decreased corporate profits. If this were the case, we would not expect corporations to be eager to initiate such programs, especially since one of the tenets on which capitalism is based is the idea that corporations should not mix societally noble goals with their mandate to maximize the value of their shareholders' wealth. Adam Smith's faith in the free market stems from just this separation of goals.

In a series of economic experiments recently performed at New York University, we have come to believe that in many empirically significant circumstances this supposed trade-off between equity and efficiency simply does not exist. In short, we find that what is equitable may also be efficient. More precisely, in terms of equal opportunity laws our experiments indicate that the imposition of such laws increases the incomes of disadvantaged groups and unambiguously increases the profits of the corporation instituting them. The reason for this is simple. If previously discriminated against groups suddenly are treated like equals, they have an incentive to try harder. If they try harder, they will elicit more effort from their previously advantaged colleagues. Hence, since all agents in the organization are trying harder, corporate output will increase without the firm's incurring any extra costs. In short, corporate profits rise.

The results concerning affirmative action laws are more complex. If the amount of historical discrimination in the corporation or society is not great, our results indicate that while such programs do increase the prob-

ability that disadvantaged groups get promoted, they tend to reduce the output and hence the profitability of the organization. However, if an affirmative action program is instituted in a situation in which some groups have met with a great deal of historical discrimination, not only do these programs help the disadvantaged group but they also increase the profits of the firms instituting them.

The reason for these results is again straightforward. When a group is highly discriminated against, we find that group members tend to become discouraged and "drop out" (i.e., they exert no effort). When an affirmative action program is instituted, these people start to try since they realize the "playing field" is more level and they have an opportunity for promotion and the other perks of career advancement. As in the equal opportunity law case, these increased effort levels spur advantaged agents to try harder themselves, with similar results for corporate profits.

When the amount of historical discrimination is not as great, our results differ because under those circumstances, agents discriminated against never drop out. They try at least a little. Hence, when the affirmative action program is implemented, they take their newly awarded preferential status as an opportunity to coast since, with the same effort as before, they will now be promoted and advanced with greater probability. Their diminished efforts induce their colleagues to do so as well, and corporate profits and output falls.

To properly understand our experiments, we must first describe how we characterize the problem of affirmative action and equal opportunity laws. In short, we view economic organization as presenting agents with a set of tournaments in which they compete for prizes. Tournaments differ from other incentive schemes in that an agent's payment in a tournament depends only on his performance relative to that of others he is compared with. In a two-person tournament, the performance of one agent is compared with the performance of another. On the basis of this comparison, the high-performance agent receives a higher payment relative to that of the low-performance agent.

Andrew Schotter and Keith Weigelt are professors at New York University.

A firm's structure inherently contains characteristics of rank order tournaments: as the organizational pyramid narrows, only the top-ranked agents move to the next, and smaller, set of promotions. For example, in corporations, several vice presidents may compete to be promoted to the presidency. In universities, untenured assistant professors compete with each other to get one of a limited number of tenured slots. In car dealerships, salesmen compete to see who can sell the most cars. The one who does is given a bonus. When all people are identical and compete in fair or symmetrical tournaments, the theory of such tournaments predicts that all people will supply equal amounts of effort (i.e., they will try equally hard) and chance will determine who gets ahead.

A tournament can be asymmetrical in two ways. It can be uneven when it is more costly for some people to perform than others. For example, if one group in society has been discriminated against in the past, one can assume that they have been deprived of some of the educational opportunities that other groups had. Hence, it may be more arduous for them to function in similar jobs than for others who have not been the victim of such discrimination. A tournament can also be unfair. In such tournaments, people are identical in the sense of having the same cost of effort, but the rules of the organization are skewed against them. That is, they are discriminated against. For example, if a tournament is unfair, some agents, in order to be promoted, not only have to perform better but must perform substantially better.

We consider affirmative action programs attempts to compensate groups for their high cost of effort by changing the rules of the tournament to favor them. In short, affirmative action programs take uneven but fair tournaments and make them uneven and unfair tournaments by treating previously discriminated groups preferentially. Equal opportunity laws take unfair tournaments and make them fair.

Before we describe our particular experiment, it is important to explain why we decided to run an experiment on this topic. In recent years, experiments have become accepted as a useful and legitimate way to test economic theories. The control of the laboratory also allows the testing of allocation and incentive mechanisms for which natural occurring field data do not exist.

Additionally, laboratory experiments are being viewed as a cost-efficient method for testing managerial reactions to various corporate policies. For example, in another piece of research we recently conducted experiments testing the long-term compensation plan of a Fortune 500 corporation. Not only were we able to produce timely results showing that the compensation policy did not have its intended effect, but we also for-

mulated alternative plans and tested their effectiveness. In short, experiments are a cheap way to pretest corporate allocating and incentive schemes before they are implemented by the corporation (i.e., before the point at which mistakes become costly).

Given our characterization of affirmative action programs and equal opportunity laws, it is not surprising that our experiments would test the performance of economic tournaments in their symmetrical, unfair, and uneven forms. A typical experiment was conducted as follows. We recruited a group of students, usual twenty-four, from economics courses at New York University. They reported to a room that had chairs placed around its perimeter, each chair facing the wall. The students were randomly assigned seats and subject numbers and given written instructions.

We informed subjects that another subject was randomly assigned as their "pair member" and that the amount of money they would earn in the experiment was a function of their decisions, their pair member's decisions, and the realizations of a random variable. The physical identity of the pair member was not revealed. The experiment then began. We asked each subject to choose an integer between zero and 100. This was called his or her "decision number," and each subject entered his or her choice on the worksheet. Corresponding to each decision number was a cost listed in a table in the instructions. The larger the number chosen, the greater the associated cost. After subjects recorded their decision numbers, an experimental administrator circulated with a box containing bingo balls labeled with the integers, including zero, usually from -40 to +40. These were called "random numbers." Each subject would pull a random number from the box, replace it, enter it on his or her worksheet, and then add it to the decision number to yield the "total number" for that round. This information was recorded on a slip of paper, which was then collected from the subject. An administrator compared the total numbers for each pair of subjects. We then announced which pair member had the highest total number in each pair. The pair members with the highest and lowest total numbers were awarded, respectively, "fixed payments" M and m , $M > m$. Each subject then calculated his or her payoff for the round by subtracting the cost of his or her decision number from the fixed payment. All the tournament's parameters except the identity of each subject's pair member were known to all subjects.

When this round was completed and the payoffs were recorded, the next round began. All the rounds were identical. Each group of subjects repeated this procedure for twenty rounds. When the last round was completed, the subjects calculated their payoff for the entire experiment by adding up their payoffs for the twenty

rounds and subtracting \$2. The experiments lasted approximately seventy-five minutes, and subjects earned between \$5 and \$13. These incentives seemed to be more than adequate.

Note the strategic nature of the experiment. Subjects knew that their earnings depended on their actions (their decision number or their "level of effort") and the actions (decision numbers or effort levels) of their pair member. Each subject had to ponder the following trade-off: The more effort they expended, the more likely they would receive the high fixed payment, but also the higher were the associated costs of effort that would be subtracted from their fixed payment. Note finally that luck (the random number) plays a role in the experiment as well.

Unfair tournaments changed the rules of the experiment by defining a parameter which told the subject by how much the output of disadvantaged subjects had to exceed the outputs of their advantaged counterparts in order for them to receive the high fixed payment.

We conducted seven experiments. Experiment 1 was symmetrical in terms of both the costs of the subject and the rules of the experimental tournament. Experiments 2 and 3 investigated how unfairness affects the behavior of subjects by performing the same experiment as experiment 1 but specifying that one group of subjects have outputs that are, respectively, twenty-five and forty-five units greater than their advantaged counterparts in order to win. Experiments 4 and 5 investigated the impact of unevenness in tournaments by specifying that one set of subjects have cost of efforts which were respectively twice (experiment 4) and four times (experiment 5) that of their counterparts. We can investigate the effect of equal opportunity laws by comparing the results of experiments 2 and 3 with the results of experiment 1 since those pair-wise comparisons would demonstrate the effects of making previously unfair tournaments fair.

The impact of affirmative action programs is investigated by comparing the results of experiments 6 and 7 with the results of experiments 4 and 5 since, in these cases (experiments 6 and 7), previously uneven but fair tournaments (experiments 4 and 5) are transformed into uneven and unfair tournaments in a way that compensates previously cost-disadvantaged groups with a rules advantage.

TOURNAMENT RESULTS

In general, the theory of tournaments predicts subjects' behavior fairly well. On average, subjects supplied the amount of effort predicted by the theory. In a separate set of experiments, we showed that as parameters

changed, subjects revised their behavior as predicted by the theory. As predicted, subjects react differently to the type of asymmetry.

In unfair tournaments (tournaments in which the rules discriminate against one set of agents), the theory predicts that despite the level of discrimination, all agents will choose the same effort level. Additionally, the theory predicts that as the level of discrimination increases in all, agents will decrease their amount of effort. We found that in our experiments, the behavior of subjects conformed to these predictions.

In uneven tournaments (tournaments in which one set of agents finds it more costly to perform a task), the theory predicts that the different types of agents will choose different effort levels and that the difference in their effort levels is equal to the differential in their cost of effort. For example, an agent who has a cost of effort that is twice as high as another agent's will only supply half the effort (because effort is twice as costly to him). Our results show that in uneven tournaments, subjects did behave as predicted.

Equal opportunity laws were quite effective in increasing the effort levels of discriminated against group members. This increase in effort causes discriminated against group members to realize greater savings. The laws also increase the effort levels of advantaged subjects; thus the net effect is that these laws increased the tournament's total effort. These findings suggest that equal opportunity laws not only help discriminate against group members, but also increase the output and hence the profits of the firm. Strategically, this finding suggests that it is in the firm's best interest not to allow discrimination in the workplace.

Affirmative action programs *always* increase the earnings of discriminated against group members. When the degree of cost disadvantageousness is low between high- and low-ability agents, these programs tend to reduce the effort levels of all subjects, and hence the total tournament output is reduced. However, when the degree of cost disadvantageousness is high, affirmative action programs tend to increase the effort levels of all subjects, and hence the tournament's total output increases.

We can draw the following implications. Not only do affirmative action programs always increase the earnings of agents with high costs of effort, but when the degree of disadvantageousness is high enough, the programs can actually increase the output of the firm. Hence, the often discussed trade-off between equity and efficiency may not be operative in the case of equal opportunity laws and affirmative action programs (or at least our laboratory version of them) where high levels of historical discrimination exist. Equity may actually be a necessary condition for efficiency. □