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The Social Contract Revisited

How to equalize opportunities

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Executive Summary

- Equality of opportunity is a generally accepted ethic in advanced industrial societies. Many people believe that outcomes should depend upon effort, but that the playing field should be levelled at the start. I interpret the contours in the unlevelled playing field as being the consequences of environmental factors beyond the control of individuals, which influence the extent to which they can acquire socially desirable objectives. Call these environmental factors (which include biological ones as well as social ones) the person's *circumstances.*

- *Effort*, in contrast, comprises the constellation of choices that individuals make. We must, however, recognize that the distribution of effort in a group of people who face similar circumstances (a type) will itself reflect the circumstances of that type. For instance, while the years of education a person achieves is due to choice, it is also true that young people from disadvantaged families choose less education than those from advantaged families. Therefore, if we wish to use observed choices as reflecting voluntary effort, we must adopt a measure of effort that sterilizes out the effect of circumstances upon choice.

- I propose that if we do so, the goal of an equal-opportunity policy becomes to render the *distributions* of the objective across types as equal as possible. Thus, *equality* is achieved across types, but *inequality* remains within type, and reflects the view that those who expend more effort should do better. I argue that adopting such policies will greatly reduce the degree of inequalities in outcomes experienced in our society, because much of that inequality is due to variation in circumstances that people face.

- We do not need to solve the problem of free will to propose equal-opportunity policies. Granted, it is a metaphysical question to what degree choices should be viewed as the responsibility of persons, as opposed to being determined by factors beyond their control. But any society can reach, through the political process, some agreement on this question: it can propose at least a minimal set of circumstances such that persons who are disadvantaged with respect to that set should be compensated. This will lead to policies which equalize opportunities, if not entirely, then at least to a degree. I show, for example, that choosing only one circumstance, the level of education of a person's parents, implies educational finance policies that are much more compensatory than we observe in most countries today.

How to equalize opportunities

A policymaker wishes to choose a policy, from a set of possible policies, that will equalize opportunities among a group of individuals for the acquisition of some desirable outcome; for example, wage-earning capacity or life expectancy. Precisely what does it mean to equalize the opportunities that individuals in this group face for acquisition of the objective in question?

To answer this question we take our cue from the popular expression that the policymaker's goal is to level the playing field for those concerned. What are the contours or troughs in the playing field that must be levelled out? They are the disadvantages that some individuals face, through no fault of their own, which will hamper their ability to acquire a desirable degree of the objective in question. Define the *circumstances* of a person as the set of environmental and biological characteristics of the person's situation which influence his or her performance (with respect to the desirable objective) and which are beyond the person's control. For the case of wage-earning capacity, this will include the nature of the family in which the person was raised (the educational level of the parents, and their income), the person's race, and the native intelligence of the individual.

The wage-earning capacity the individual acquires will also be influenced by his or her choices: for instance, the number of years of education to acquire, what occupation to enter, and so on. Let us describe her behaviour with respect to these *choices* as *effort*. Clearly effort itself is influenced by circumstances: children from more highly educated parents choose more education for themselves than children who were raised by poorly educated parents. So we must be cognizant of the fact that effort itself is influenced by circumstances.

The basic idea of equal opportunity is that the playing field should be levelled, but after that, people will acquire different levels of accomplishment due to their differential efforts, and that the final inequality which results is ethically acceptable. In this sense, people are being held responsible for their efforts, but not responsible for their circumstances. However, there is an important caveat, due to the fact that effort itself depends on circumstances. How can we compare the effort levels of people who have different circumstances? Some way of sterilizing out the impact of circumstances upon effort must be found, so that the effort comparison will not carry the imprint of the different circumstances the individuals face.

Let us write the value of the objective which a person will achieve to be a function $u(C, e, \varphi)$ of his circumstances (C), his effort (e), and the policy set by the planner (φ). I emphasize that u is *not* a utility function: persons may be differentially interested in realizing the objective at hand, and therefore will differentially exert effort to accomplish that end. For instance, if u is life expectancy, one example of low effort is smoking, because it is a voluntary activity (let us suppose) which reduces the value of that objective. My planner, however, is — in this case — the minister of health, and she is interested in equalizing opportunities for life expectancy in her society. The function u is not subjective: it is, so to speak, technological, summarizing how circumstances, effort, and policy combine to produce an outcome.

Suppose that the population in question face a number of discrete kinds of circumstances. For instance, if we take the educational level of parents as the key circumstance, we could partition the population into three *types*: those whose more educated parent had less than a high school degree, those whose parent had just a high school degree, and those whose parent had at least some tertiary education. A type is the set of people with similar circumstances. Continuing the life-expectancy example, we would define effort as an index of the choices that people make which influence their life expectancy, perhaps an index including whether or not they smoke, and their eating and exercise habits. We can construct this index by

observing the relationship of these behaviours and circumstances to age of death in our population. Now the set of policies φ is a set of interventions available to the Health Ministry: health insurance, spending on educational programmes showing the links between effort and mortality, income transfers, and so on. If we can measure the effect of circumstances, policy, and effort on life expectancy, then we can construct the function *u*.

For any policy φ that is chosen, there will result a specific distribution of effort in each social type. It is important to note that these distributions of effort may be very different across types. For instance, if we take socio-economic status as a circumstance, it may be the case that the distribution of effort is much worse in poor types than rich types. In particular, the distribution of effort is itself a *circumstance*: it is beyond the control of any individual, and it is influenced by the other circumstances.

Equality of opportunity is achieved, I say, when the degree of acquisition of the objective is independent of a person's circumstances, but responsive to his degree of effort. Let us return to the problem of how to compare the effort levels of people from different types, cognizant of the fact that those levels are influenced by circumstances. We can easily compare the efforts of people within the same type: simply observe which one has the higher index of the choices we call effort. But to compare the efforts of two people in different types we require a measure of the degree of effort which sterilizes the index of effort of circumstances upon it. Such an index is the *rank* of the person in the effort distribution of her type. Thus, I propose that two people, in different types, have expended the same *degree of effort*, if they lie at the same centile of the effort distributions of their types. Thus, to decide the degree of effort a person has expended, we compare him only to others of his type.

Now by definition, effort is defined as that constellation of choices which, if increased, will increase the value of the objective, within any type. It follows that the individual at the p^{th} centile of the effort distribution of his type, will also be the person at p^{th} centile of the distribution of the objective in his type (since circumstances and policy are fixed for a type). Therefore, equality of opportunity for the objective is achieved precisely when the distributions of the objective are identical across types. For this is the result if we equalize the objectives at every centile of their distribution, across types. That is, the planner desires to choose the policy to equalize the *distribution* of the objective for every type.

To summarize, the *equality* part of equal opportunity is that regardless of one's circumstances, one will face the same distribution of the objective; that is, one will have the same probability of achieving given levels of acquisition of the objective, regardless of type. The *opportunity* part is that we do not seek to equalize the value of the objective across all persons, but only to equalize the distributions of the objective across types. Greater effort will bring about a greater degree of acquisition of the objective within type. Thus, a person is not responsible for his circumstances, but is responsible for his choice of effort.

Here is a graphic example. In the example, the outcome for which opportunities are to be equalized is 'wage-earning capacity'. The single circumstance is the level of education of the more educated parent of the individual. In Figure 1, I plot the cumulative distribution of earnings for three types of male workers in the United States that I defined above. We see the cumulative distribution functions for these three types of worker do not cross: a person's chances of earning more are unambiguously greater, the more education his parent acquired. The difference *between* the cumulative distribution functions is due to unequal opportunity: the difference *along* each distribution function is interpreted as due to differential effort. The goal of an opportunity equalizing policy is to make these three distribution functions closer together. In Figure 2, I plot the same three distribution functions for Denmark: it appears that opportunities for wage-earning capacity are much more equal in Denmark than in the United States.

Figure 1
The cumulative distribution of earnings, US male workers, 1992, typed according to educational level of the mother

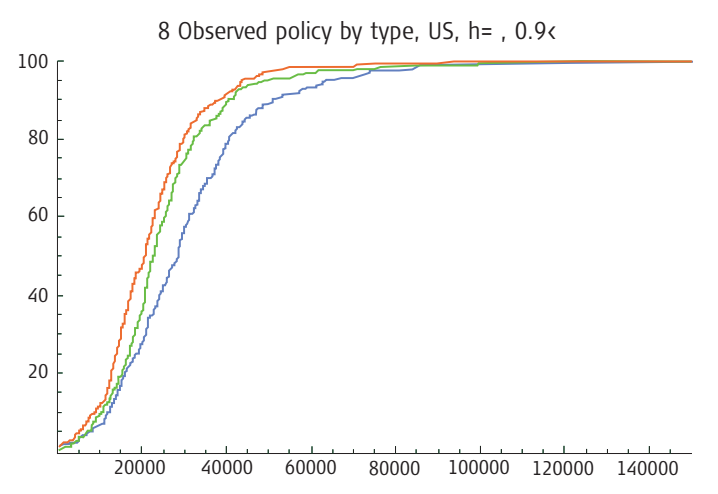
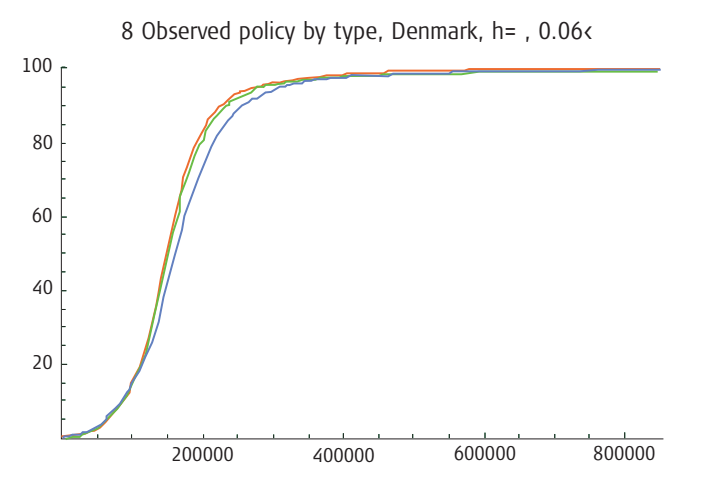


Figure 2
Cumulative distribution function of earnings, Danish male workers, 1990, typed according to education of the mother



In practice, it is almost always impossible to find a policy that will equalize perfectly the distributions of the objective across types. One must, therefore, adopt some second-best approach. A number of such approaches have been proposed. The simplest one is to choose that policy that maximizes the minimum of the mean value of the objective across types. This sounds very much like Rawls's difference principle – except here, it is applied only to the aggregates called types, rather than to individuals. There are other second-best measures that I will not discuss here, but can be found in my book (Roemer [1998]).

Two examples

I will present two applications of this approach. The first takes the population to be American males, the objective to be wage-earning capacity, circumstances to be characteristics of the individual's family background (parental education, parental income, etc.). To be specific, in the computation I describe, my co-author, Julian Betts, and I chose the education of the mother to be the single characteristic of type, and we partitioned the population of young men into four types: mother had less than eight years of education, mother had more than eight years but less than twelve years, mother had twelve years, and mother had more than twelve years. The policies are educational finance policies, of the form (x_1,x_2,x_3,x_4) where we take a given total budget for K-12 education, and assign a different amount of expenditure to each of the four types. Thus all students of type 3 will receive educational funding in per capita amount x_3. In the United States, because we have local financing of K-12 education, there is much variation in per-pupil spending around the country, and we can use available data sets to estimate how adult wages vary as a function of per-pupil expenditure and type. Using these data sets, we compute the required relationships, which give us the function u. Then we solve the following problem: Find the vector of type-expenditures $x = (x_1,x_2,x_3,x_4)$ that makes the distribution of wages across the four types as close as possible to identical. (We use a somewhat more complex measure than maximizing the minimum of the mean wages across types.) The result is presented in Table 1.

The young men in the sample were in secondary school in the late 1960s, and we took the annual per-pupil expenditure to be $2500, the US national average at that time. The equal-opportunity allocation would have required spending approximately five times as much per pupil on the most disadvantaged type as on the most advantaged type. Note that this allocation is very different from the 'equal resource' allocation of $2500 per pupil of all types. Indeed, even achieving that equal-resource allocation would have been a considerable improvement over the existing US allocation in 1970,

Table 1: Equal opportunity allocation of investment with per capita budget of $2500 per student per annum

Parental Education	‹ 8 years	8-12 years	12 years	› 12 years
Equal-opportunity (EOp) investment	$5360	$3620	$1880	$1100

From: Betts and Roemer (2008)

where richer municipalities spend more on their pupils than poor ones. The equal-opportunity allocation is highly skewed towards the disadvantaged.

Moreover, we predict that if educational resources had been allocated in this manner, then the average wage would have risen by 2.6 per cent compared to what it in fact was. Thus, equalizing opportunities, in this case, increases total output. That is, the increased spending on disadvantaged types 'more than pays for itself', as it liberates talents that were, under the present system, insufficiently nurtured. This happy result will not always occur with equal-opportunity policies.

My second example is a hypothetical health example. Suppose there is a society with two types, Poor and Rich; 25 per cent of the population is Poor and 75 per cent is Rich. We take these to be the two types. There are two diseases, tuberculosis (TB) and cancer. Both types are susceptible to cancer, but only the Poor will contract tuberculosis. The probability of contracting cancer is the same for the Poor and the Rich, as a function of the quality of lifestyle (which is effort), denoted q, which is:

$$s^{CP}(q) = s^{CR}(q) = 1 - \frac{2q}{3}.$$

Notice that the probability of contracting cancer is lower, the higher is lifestyle quality q.

A Poor person's probability of contracting TB as a function of lifestyle quality is:

$$s^{TP}(q) = 1 - \frac{q}{3}.$$

The life expectancy of a Rich person is:

70 if cancer is not contracted, and

$60 + 10\,\frac{x_c - 1}{x_c + 1}$ if cancer is contracted, and x_c is spent on its treatment.

The last formula expresses the fact that life expectancy increases for a cancer victim as spending on treatment increases: without treatment, life expectancy will be fifty, and with very expensive treatment it will approach (but not reach) seventy. Suppose the life expectancy of a Poor person is:
70 if neither disease is contracted,

$60 + 10\,\frac{x_c - 1}{x_c + 1}$ if cancer is contracted and x_c is spent on it treatment, and

$60 + 20\,\frac{.1x_t - 1}{.1x_t + 1}$ if TB is contracted and x_t is spent on its treatment.

Thus, the Poor will have a life expectancy of only thirty if TB is contracted and not treated, and TB is hard to treat, so life expectancy does not increase very rapidly with expenditures on the disease.

Now suppose that the Poor have lifestyles whose qualities q are uniformly distributed on the interval [0, 1], while the Rich have lifestyle qualities that are uniformly distributed on the interval [0.5, 1.5]: thus, the Rich have healthier lifestyles, on average. Suppose that the health-care budget of the country is $3000 per capita. Suppose a *policy* is a vector of expenditures (x_c, x_T) which prescribes how much will be spent on each case of cancer and each case of TB. Note these expenditures are, *ex hypothesi*, independent of the type of the person; treatment will be *horizontally equitable*, in the sense that each case is treated in the same way, regardless of the type of person, *and regardless of the lifestyle of that person*. Of course, given the knowledge of frequencies of the disease in the population as a

function of lifestyle, and of the distributions of lifestyle of the two types, and its budget, the Ministry can compute the set of feasible policies. The problem then is to choose the policy that maximizes the minimum (average) life expectancy across the two types.

The solution turns out to be:

x_C = \$250, x_{TB} = \$13,900;

much more is spent on a case of TB than on a case of cancer.

The life expectancies of the two types as a function of their lifestyles turn out, given these expenditures, to be those shown in Figure 3. We see that, of course, life expectancy in both types remains an increasing function of lifestyle quality, for that quality affects the probability of contracting the diseases. Moreover, even at the equal-opportunity solution, the Rich still have higher life expectancy than the poor at every degree of lifestyle quality. Why does the life expectancy of the Poor remain considerably below that of the Rich? Because we do not discriminate between the Poor and the Rich in treatment. There is no other feasible policy which would raise the average life expectancy of the Poor above what it is at this policy, *given that we maintain horizontal equity* (equal treatment for equal symptoms). If we wished to discriminate between the Poor and Rich in cancer treatment, we could raise the life expectancy of the Poor considerably higher, at the cost of reducing the life expectancy of the Rich. But I have chosen the set of policies to disallow this kind of discrimination, as I believe such discrimination would be politically unacceptable in our society.

Figure 3
Life expectancy as a function of effort at the equal-opportunity optimum (Rich and Poor)

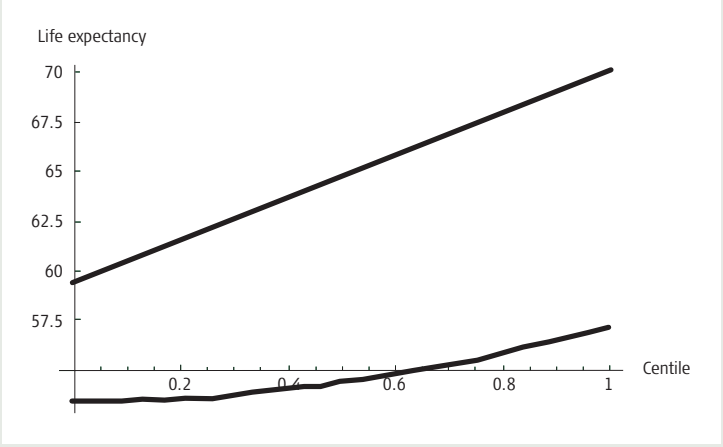
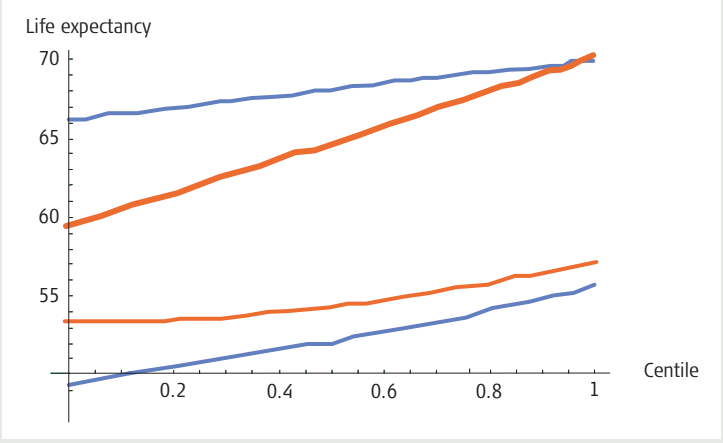


Figure 4
Life expectancy as a function of effort for Rich and Poor: EOp (red lines) and Utilitarian (blue lines)



Let me contrast the equal-opportunity policy with the *utilitarian* policy, which is the policy from the same feasible set of policies that maximizes the average life expectancy of the entire population. This policy turns out to be

x_{Ut} = \$2520, x_{TB} = \$9350.

We now spend much more on cancer than before, and correspondingly less on TB. Notice from Figure 4 that the life expectancies of the two types are much farther apart under the utilitarian policy: we have a higher average life expectancy in the population at the cost of greater inequality of life expectancy across types. Virtually all health ministries today, were they to face this kind of problem, would choose the utilitarian policy, because that is the dominant ideology in health economics, as in economics quite generally. I am proposing that the equal-opportunity policy may be the better one, if we believe that poor people are in large part poor through no fault of their own, and therefore that equalizing opportunities for life expectancy for the Rich and the Poor is an ethically attractive view.

Let me summarize a number of features of these two examples.

1. Effort is treated as the residual explanation of the level of the objective, once circumstances are delineated. If we wish to predict the distribution of the objective within each type, we will require a theory of how the policy chosen will influence the distributions of effort, and hence the distributions of the objective.
2. The policy itself can be type-blind and effort-blind in its application, as in the health example. This is a matter of how the policy space is chosen. We *can* make the policy applied depend on the individual's type, but we *need* not. Similarly, we can make the policy applied depend upon the individual's effort, but we need not. In both examples given, the policy did *not* depend upon individual effort; in the education example, it does depend upon the individual's type.
3. Equality of opportunity attempts to equalize the objective across types while utilitarianism attempts to maximize the average of the objective in the aggregate. Thus equal-opportunity policies will deliver *lower average accomplishment* then utilitarian ones and utilitarian policies will be less equal across types than equal-opportunity ones. This is by *definition* what it means to maximize each of the two social objectives subject to constraint.
4. One can design equal-opportunity policy to be consonant with a society's views concerning responsibility by choosing the set of circumstances t o reflect those views. The more characteristics of the person's environment we include in this set, the less will performance be attributed to effort. In the limit, if we choose each individual to comprise a single type, then there is no scope for effort, and the equal opportunity converges to the Rawlsian maximin across all persons. At the other extreme, if we choose all persons to be of one type, then the policy is simply utilitarian: maximize the average value of the objective *tout court*. In general, the equal-opportunity policy is less redistributive than complete maximin and more redistributive than utilitarianism.

Critiques and caveats

Some writers have argued that to implement the equal-opportunity policy requires an invasion of privacy, in order to ascertain the effort that individuals have expended. (One envisions grilling a lung-cancer victim about his smoking behaviour before treating him.) The examples show this to be false: in neither example is it necessary to ascertain the effort of individuals before applying the policy. Indeed, in the health example, it is not even necessary to ascertain their type! The planning Ministry does need to know the effort response to policies by type, in the society: but this can be ascertained with studies on small representative samples of the population. Formally, it is only *distributions* of effort and objective with which the planner is concerned, not individual responses.

Some critics say that effort, in the sense of actions for which individuals should be held responsible, is a useless concept when it comes to something so vital as health, or even education. These critics say that relevant actions in these spheres are socially determined, not voluntary. My response is that they are both socially determined *and* voluntary. When the price of tobacco is sufficiently high, fewer people smoke: thus, smoking is (to some degree at least) an act of choice. More educated people typically smoke less than the poorly educated: so smoking is (to some degree at least) socially determined; that is, determined by circumstances. In any case, the equal-opportunity theory is *agnostic* concerning the *true* role of voluntary effort versus circumstances in determining behaviour: rather than solving this metaphysical problem, it provides a policy which is *consonant* with any particular view one might delineate concerning responsibility and circumstance. Here, that view is implemented in the choice of the set of circumstances that the Ministry makes, which presumably reflects society's view on the question.

Some critics focus upon the *inequality* (within types) that results from application of the equal-opportunity policy: but one may just as well focus upon the *equality* (across types) which it implements. Indeed, the equal-opportunity educational finance policies I presented are radically more egalitarian than the finance policies of the United States, in terms of compensation for social disadvantage.

Now, to some caveats. What is the scope of equal-opportunity policy? Should the Ministry of Sports require professional basketball teams to admit a certain number of very high effort, short players (that is, should height be considered a circumstance in this case)? Obviously the answer is no. Equal-opportunity policy considers only the welfare of the people who are competing for some social advantage in a world of scarce resources. The examples I have given do not take into account the effect of this policy on the general welfare of the entire population. (Some gesture towards accounting for this effect was made, when I noted that the average wage would increase under the equal-opportunity policy in the education example: thus society would be provided with more goods than otherwise. But this result was fortuitous.) In the case of professional basketball, there is a very small number of players, and millions of fans: the welfare of the many fans should count more than the welfare of the few players (I would argue). Assuming short players on a team would produce an inferior game; the fans' welfare trumps equalizing opportunities among players.

Consider a more serious example. Should we admit some socially disadvantaged but high-effort surgeons to the surgery profession, whose surgical performance is inferior to that of their socially advantaged colleagues? Fairness among surgeons would perhaps say yes; consideration of the welfare of the patients would say no. Again, I would say the welfare of the patients, who consume the output of surgery, trumps equal opportunity for would-be surgeons.

I propose a general rule of thumb: when we are considering individuals who are being trained or educated, apply equal-opportunity principles. When we consider people competing for professions or occupations in society, stress merit; that is, capability in job performance. Thus, I would have an equal-opportunity admissions process for medical schools, but would apply strict merit principles in licensing would-be surgeons. I would admit a certain number of short basketball players to high school teams, which have an educational function (short players may end up being basketball coaches), but I would consider only basketball prowess for recruitment to professional teams.

I believe this rule of thumb has general support among some citizenries, at least in the United States. In the debate over affirmative action admissions to universities in the United States, many objected to counting race as a circumstance, but they do not object to counting socio-economic disadvantage as a circumstance. Thus the Universities of California and Texas, both public institutions, some years ago replaced racial preferences with preferences for socio-economic disadvantage: of course, African-Americans and Hispanics count highly in the economically most disadvantaged type. Citizens, in this case, did not object to an equal-opportunity policy, but they objected to counting race as a circumstance, because it sometimes did not correlate well with economic disadvantage. (Indeed, those opponents argued that many of the beneficiaries of the racial affirmative action policies were upper-middle class African Americans.) But with respect to hiring, citizens objected to any kind of affirmative action: here, they expressed the opinion that hiring should be meritocratic. This is the cut between education and training, on the one hand, and competition for occupations, on the other, that I suggested above.

Conclusion

Equality of opportunity is a generally accepted ethic in advanced industrial societies. Many people believe that outcomes should depend upon effort, but that the playing field should be levelled at the start. I have proposed that if we do so, the goal of an equal-opportunity policy is to render the distributions of the objective across types as equal as possible. Thus, *equality* is achieved across types, but *inequality* remains within type, and reflects the view that those who expend more effort should do better.

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