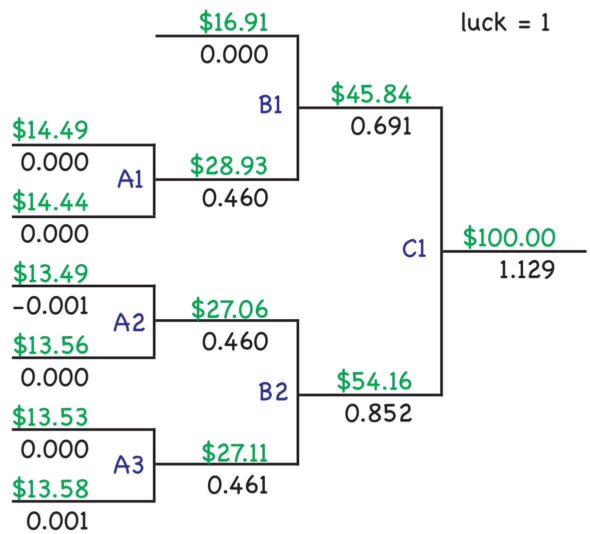
Fairness (B)

Fairness (B) is the fairness of equal opportunity. It is the kind of fairness that springs most easily to many people's minds. It is often the easiest to achieve. But, oddly, it is also the only one of the three types of fairness that is often sacrificed entirely.

Equality is a mathematical notion, so fairness (B) is relatively easy to express in numerical terms. In this section, I'll introduce a numerical measure that will give more substance to the general notion of fairness (B) by allowing levels of inequality to be measured.

To see fairness (B) in action, let's return to the simple, eight-team single elimination bracket discussed in chapter 1, except this time let's make it a seven-team tourney. That means that one team will get a bye in the opening round.



At the right is the analyzed bracket. Now that there's a bye in the first round, the starting lines are no longer about equal. When the bracket was full, all of the starting lines in the A round were worth $12.50. Now that there's one fewer player, the $12.50 that would have been expected by that player goes to others. But it hasn't been spread evenly. The lucky team that draws the bye gets almost $4.50 extra. The two teams that play A1 each get about $2. This is because, if they win, they'll draw the unproven bye team in the next round, and so have a better chance to win. The teams in the lower half of the bracket benefit to a lesser extent, each getting about $1.

$	16.91	1.184
$	14.49	1.014
$	14.44	1.011
$	13.49	0.944
$	13.56	0.949
$	13.53	0.947
$	13.58	0.951
	100	**8.66**

Here's a fairness (B) problem. Not everyone has an equal chance.

It's useful to have a way to compare fairness (B) problems numerically, so we define a statistic. To calculate the fairness (B) measure for this bracket, you normalize the expectations for each entry line by dividing it by the mean expectation. The fairness (B) measure is simply the standard deviation of those normalized expectations, multiplied by 100. The result for this bracket is 8.66.

Now, to some extent the inequality of outcomes comes from the random noise—recall that even a million trials was not enough to yield a perfect $12.50 expectation for every entry line in the full bracket. The fairness (B) measure for the luck = 1 bracket on page x is 0.36—not high, but not, as it should be, zero.

One reason that the fairness (B) measure is multiplied by 100 is to take advantage of an observation I've made when running simulations of brackets that, like the full 8 bracket, are structurally fair from a fairness (B) perspective. That is that when there are enough iterations on a bracket to yield usable results for other purposes, the measured fairness (B) of an equitable bracket is less than one. As a practical matter, then, I consider any measured fairness (B) of less than one to be a fair bracket, and the measured unfairness the result of random variation.

It's important to note that what's been defined here might more accurately be called a measure of unfairness. Lower numbers are better.

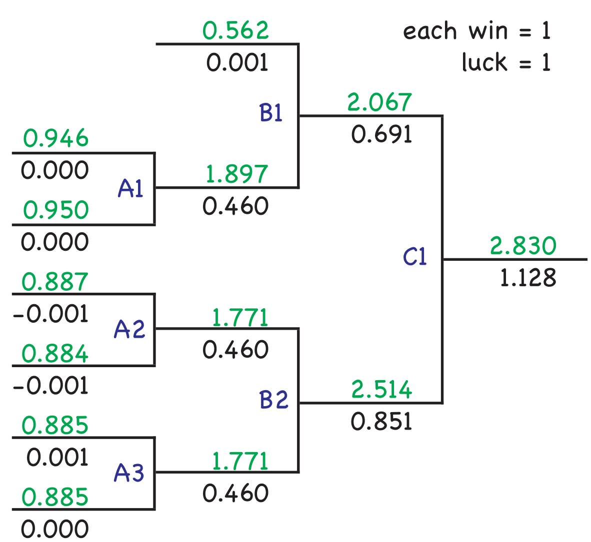
Fairness (B) can be calculated for individual rounds also, and it will frequently be helpful to do so. The number that's calculated for the bracket as a whole is based on the entry lines, in whatever round they occur. In this instance, six of the entry lines are in round A, and one in round B. For round A by itself, the calculation yields 3.44. So round A is not a particularly inequitable round for the six players who play there—the inequality comes because of the one player who skips round A altogether. But for the B round the inequality is much worse, yielding a figure of 21.67. It settles down, a bit, for the C round, which comes in at 11.67.

To keep the various forms of the fairness (B) statistic in line, fairness (B) statistics are reported with the following convention. A fairness (B) calculation that's based on entry lines, and thus is characteristic of the bracket as a whole is simply called fairness (B). Where the calculation is based on a particular round it's reported with a lower-case "b", a colon, and the round identifier, for example fairness (b:A). Frequently, all of the entry lines in a bracket are in the A round, in which case fairness (B) and fairness (b:A) are the same thing. Especially where round results are involved, "Fairness" is sometimes abbreviated to "F", to yield something like this: F(b:A).

The example we've considered so far was for a high-skill, blind-draw tourney, with a single $100 payout to the winner. Changing any of these things will affect the measured level of fairness (B).

If the same bracket is played for a high-luck game, fairness (B) soars to 24.93. When skill is high, the one player drawing the bye faces stiff competition in the B round because of the steep skill progression. With more luck, and hence less skill progression, both the B and C rounds are easier. While the overall level of fairness (B) increases markedly, the individual rounds are fairer: fairness (b:A) = 1.46; fairness (b:B) = 7.21; and fairness (b:C) = 3.65.

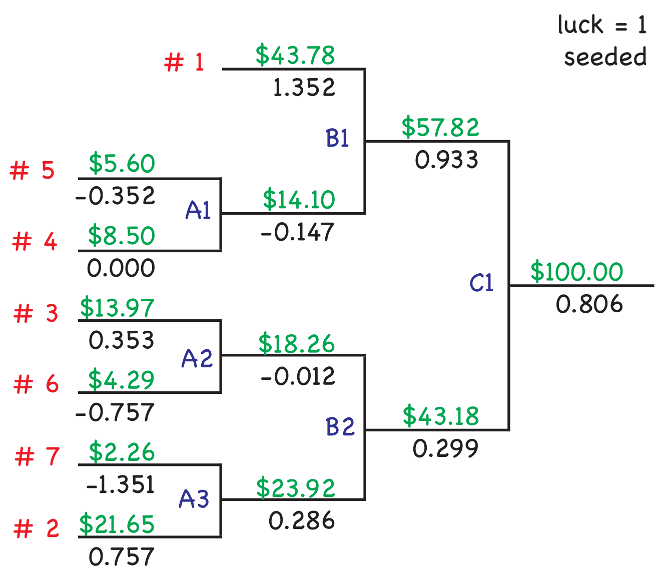
Because the fairness (B) calculations are based on the distribution of rewards in the tourney, they can change markedly when the payout scheme is changed. Let's suppose that our seven-team tourney has no prize fund to be distributed, and that the only benefit to the players is the psychic reward they get from winning individual matches. Since there are six matches to be played, the total rewards for the players sum to six.



Here what was the great good fortune of the player who draws the bye turns into a stiff penalty. That player loses the chance of a win in the A round, but still faces much stiffer competition in the B and C rounds due to the skill progression. The result is much less equitable, with fairness (B) = 15.57. F(b:A) = 3.58; F(b:B) = 41.88; F(b:C) = 13.80.

All of these fairness problems flow from the presence of the single bye. In general, most fairness (B) problems are associated, in one way or another, with byes. The chapter on byes will discuss these issues in much greater depth.

But severe fairness (B) issues also arise due to seeding. When you decide to seed a tournament, you're pretty much abandoning any pretense of valuing fairness (B). In most cases, instead of trying to draw an equitable bracket, you're drawing a bracket that's been purposely manipulated to aid the better players at the expense of the less skillful ones.



The hows and whys of seeding are discussed in much greater detail in chapter X. But as a preview, we'll look at our seven-team bracket seeded in the most conventional way. The bye goes to the top-seeded player, and is now considered an earned bye.

Fairness (B) soars to 102.10. F(b:A) = 77.38; F(b:B) = 52.53; and F(b:C) = 20.50.

Fairness (B) numbers are rarely reported for seeded brackets because it is assumed that no one cares. Seeding is almost always in derogation of fairness (B).

This is not to say that tournament directors should entirely disregard considerations of fairness (B) when running seeded tournaments. In all matters other than loading the initial bracket, inequities should be avoided.