How Bookmakers Set Their Odds

Have you ever sat there wondering how bookmakers actually calculate their odds in the first place? Where do those numbers even come from? The sportsbooks don't just make them up … right?

Even with the help of specialized software today, calculating odds for sports betting is still a complicated process overall. Bookmakers have to take into account so many factors, from team history to statistical analysis, to come up with their numbers. The process is also designed so that, no matter what the outcome of any given sporting event, the bookmaker will make a profit.

To better make the odds potentially work for you instead of against you, you need to understand how bookmakers set their odds. From there, you can see if a bet has value to make it worth putting your hard-earned money at risk.

How Bookmakers Calculate an Event's True Odds

First, before even publishing their odds for bettors to wager on, bookmakers have to calculate what's known as the true odds. These are the odds without any interference or overround — a bare-bones look at how likely an outcome truly will be between two teams or individual players.

Bookmakers have plenty of factors that they need to analyze in order to reach a realistic conclusion for the true odds for any event.

History Between the Two Teams

To prepare for a two-sided matchup, bookmakers will look at how the two sides have fared against each other in the past. Maybe the upcoming game is between the Boston Celtics and the Minnesota Timberwolves. By just looking at how these teams have done against each other in the past, it's pretty easy to assume that the Celtics will win the matchup.

Home Team Advantage

In sports like Major League Baseball, home teams have won 54% of the time during the regular season. Bookmakers look at factors like this and create entire charts showing all of the teams' win/loss records broken down by home games and away games to determine the likelihood of one team winning over the other.

Injury Reports

If a key player is benched because of an injury, that will obviously affect how the team will play in an upcoming matchup. Bookmakers can see when a player got sidelined and how that has affected the team during practice. They can also see if one team has been hit hard with a lot of player injuries at once and how that will affect overall play.

Weather Reports

Yes, bookmakers will also look at the weather forecasts for any games that are played outdoors. Some teams might have a hard time playing in the rain because they're used to training in a covered stadium. Others might come from a warmer climate and have trouble playing in the snow. Some bookmakers might even take projected wind gusts into account when calculating their odds because of how it could affect the ball.

Statistical Analysis

When it comes to the statistics part of calculating odds, bookmakers typically use a multiple regression analysis. This analysis determines the relationship between a dependent variable and one or more independent variables. For sports betting, winning is the dependent variable, while the independent variables can include any statistic like rushing yards per game or passing completion percentage.

Bookmakers have to focus on more than one statistic, of course, so their statistical system considers multiple regressions to predict a future outcome based on past data. For example:

- The Utah Jazz have an upcoming home game against the Denver Nuggets.
    - Regression 1: Denver won the last game these two played against each other by 2 points. It was a home game for Denver.
    - Regression 2: The Jazz have won 65% of their games at home.
    - Regression 3: The Nuggets give up an average of 104 points per away game.
    - Regression 4: The Jazz win 97% of the games in which they score 100 points or more.

From there, the bookmaker can extrapolate a predicted outcome. Based on this data, Denver is expected to have worse defense during an away game, while the Jazz tend to fare better at home. Despite the Nuggets winning their most recent matchup, the data seems to suggest that the Jazz will take the upcoming game in Salt Lake City.

The more historical data sets they can review, the more reliable the bookmaker's regression analysis can be.

From there, bookmakers can use probability distributions to find the likelihood of different possible outcomes. Depending on the sport, they may use:

- **Bayesian networks:** This is a type of graphical model in which the networks are broken up into levels consisting of variables that might impact the outcome of a matchup.
- **Poisson distribution:** Usually used for soccer and hockey betting, Poisson distribution works by converting mean averages into a range of probabilities.
- **Binomial distribution:** This is the probability of successes and failures in an experiment that's repeated multiple times. If a person's betting system has, say, a 60% winning percentage, they can calculate the most likely record over a course of successive bets.

Shifting the Odds With Overround

When you're spinning a roulette wheel, you will always have a 1-in-38 chance (on an American wheel) of having the ball land on your number. However, the house will adjust its odds so that they pay out at 36 to 1. This way, the house always has an advantage, or edge, over the players. Bookmakers work in the same way by creating an overround.

While the odds are always going to be far more complex in sports betting than with table games like roulette, the bookmaker will always be sure to add in that overround to guarantee some level of profits.

If you're looking at a sportsbook's given probabilities for a matchup, you might see that one team has, for example, a 59% chance of winning while the other has a 43% chance of winning. This actually totals up to 102% for the implied probability of the matchup, and that 2% overage is the bookmaker's overround.

From there, the bookmaker can adjust their overround to create the amount of their commission — that "house edge," also known in sports betting as the vig or vigorish.

Adapting the Odds Due to Uneven Betting

Right before some sporting events, sportsbooks might adjust their odds a bit more. This can happen when the weight of the money moving around starts going too heavily to one side over the other.

If the favorite is getting far more bets than the underdog, then the sportsbook will increase the odds on the underdog to attract more bettors. Meanwhile, if the underdog is suddenly attracting a ton of bets, then the sportsbook will reduce that team's odds to protect their profit margin.

You Can Use This Information To Determine Value

It's possible to calculate the sportsbook's actual probability based on the implied odds they've published for bettors. You can remove the vig from what's presented and get a clearer idea of what the bookmakers think the actual probabilities are.

From there, you can compare the actual vs. implied probabilities to determine a bet's value. If the actual probability is higher than the implied probability, that's a positive-value bet and something you should definitely put your money down on.

Here's an example matchup:

Team	Implied Probability	Actual Probability
Las Vegas Aces	57.44%	60%
Chicago Sky	46.51%	40%

In this scenario, the actual probability for the Las Vegas Aces to beat the Chicago Sky (60%) is higher than the book's implied probability (57.44%). This bet would have a positive value, so you should view this as a smart bet to wager on.

The Future of Odds-Making

With sports betting becoming legal in more states in the U.S., fans will also see more sportsbooks open up. But, because calculating all of these odds is a large and intricate task, plenty of these sportsbooks will most likely outsource that work, which means that bookmakers' odds will likely become more standardized and offer less variation between websites.

The best way around this might be to sign up at multiple online sportsbooks to see if they offer different odds. Maybe you can find some bets with positive value on one of them and get the best bang for your buck.