

ANALYSE OF ODDS

ODDS:

Betting odds are a tool that reveals an oddsmaker's opinion (or stance) on a particular game, event or proposition. They also reflect how much money bettors must risk to win a specific amount—that is, the potential payout.

TYPES OF ODDS:

There are three types of odds: **American**, **Decimal**, and **Fractional**. One type of odd can be converted into another and can also be expressed as an **implied probability percentage**.

+120 AMERICAN -150	2.2 DECIMAL 1.667	6/5 FRACTIONAL 2/3
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ACTUAL PROBABILITY:

Actual Probability which you believe is the real probability of the event happening and will only be known by you and your bookmaker

IMPLIED PROBABILITY:

Implied Probability which is the sum of the actual probability and the profit margin. This is what you will advise your bookmaker to show on their website.

Implied probability is a conversion of betting odds into a percentage. It takes into account the bookmaker margin to express the expected probability of an outcome occurring.

Actual Probability will be 100% and the total Implied Probability (on the website) will be over 100%.

CONVERTING ODDS INTO IMPLIED PROBABILITIES:

AMERICAN ODDS TO IMPLIED PROBABILITIES:

There are two instances of American odds (positive and negative) which require separate calculations.

NEGATIVE AMERICAN ODDS: -150

$$\text{Negative American odds} / (\text{Negative American odds} + 100) * 100 = \text{implied probability}$$

$$\text{IMPLIED PROBABILITY: } (150 / (150+100))*100 = \mathbf{60\%}$$

POSITIVE AMERICAN ODDS: 120

$$100 / (\text{positive American odds} + 100) * 100 = \text{implied probability}$$

$$\text{IMPLIED PROBABILITY: } (100 / (120+100))*100 = \mathbf{45.45\%}$$

DECIMAL ODDS TO IMPLIED PROBABILITIES:

FOR: 2.2 ODDS

$$\text{IMPLIED PROBABILITY: } (1/\text{DECIMAL ODDS})*100 = (1/(2.2))*100 = \mathbf{45.5}$$

FOR: 1.667 ODDS

$$\text{IMPLIED PROBABILITY: } (1/\text{DECIMAL ODDS})*100 = (1/(1.6))*100 = \mathbf{60\%}$$

FRACTIONAL ODDS TO IMPLIED PROBABILITIES:

FOR: 6/5 ODDS

$$\text{denominator} / (\text{denominator} + \text{numerator}) * 100 = \text{implied probability}$$

$$\text{IMPLIED PROBABILITY} = (5 / (5+6))*100 = \mathbf{45.5\%}$$

FOR: 2/3 ODDS:

$$\text{IMPLIED PROBABILITY: } ((3)/(3+2))*100 = \mathbf{60\%}$$

NOTE: If the odds are higher the implied probability would be lower.

EXPECTED VALUE:

Expected value is a predicted value of a variable, calculated as the sum of all possible values each multiplied by the probability of its occurrence.

$$E(X) = \sum(P(x=X))$$

$EV = (\text{Amount won per bet} * \text{probability of winning}) - (\text{Amount lost per bet} * \text{probability of losing})$.

USE OF EXPECTED VALUE:

In betting, the expected value (EV) is the measure of what a bettor can expect to win or lose per bet placed on the same odds time and time again. Positive expected value (+EV) implies profit over time, while a negative value (-EV) implies a loss over time. All bettors should be aiming to identify betting value with every bet they make.

CASE STUDY ON FOOTBALL MATCH

★ Match Odds		CASH OUT		⌚ 5s		Back	Lay	Rules
Melbourne Victory	2.5 330	2.52 767	2.54 925	2.58 70	2.6 20	2.62 36		
Wellington Phoenix	7.8 306	8 290	8.2 34	8.4 21	8.6 57	8.8 28		
The Draw	1.99 31	2 223	2.02 137	2.04 51	2.06 1,023	2.08 2,120		

IMPLIED PROBABILITY:

Converting the odds from decimal to percentage is done by dividing 1 by the odds and multiplying by 100%

BACK: Someone betting on an outcome to happen (a back bet)

MELBOURNE VICTORY: FOR BACK: 2.54 (BEST VALUE TO BUY)

IMPLIED PROBABILITY: $2.54 \text{ odds} = (1/2.54) * 100 = 39.37\%$.

EXPECTED VALUE: FOR \$1: $(1.54 * 0.39) - (1 * 0.61) = -0.01$

WELLINGTON PHOENIX: FOR BACK: 8.2 (BEST VALUE TO BUY)

IMPLIED PROBABILITY: $8.2 \text{ ODDS} = (1/8.2) * 100 = 12.19\%$.

EXPECTED VALUE: FOR \$1: $(7.2 * 0.12) - (1 * 0.88) = -0.02$

THE DRAW: FOR BACK: 2.02 (BEST VALUE TO BUY)
IMPLIED PROBABILITY: 2.02 ODDS = $(1/2.02)*100 = 49.50\%$.
EXPECTED VALUE: FOR \$1: $(1.02*0.49)-(1*0.51) = -0.02$

TOTAL IMPLIED PROBABILITY FOR BACK: $39.37+12.19+49.50 = 101.06$

LAY: Someone betting on an outcome not to happen (a lay bet)
MELBOURNE VICTORY: FOR BACK: 2.58 (BEST VALUE TO SELL)
IMPLIED PROBABILITY: 2.58 odds = $(1/2.58)*100 = 38.75\%$.
EXPECTED VALUE: FOR \$1: $(1.58*0.38)-(1*0.62) = -0.02$

WELLINGTON PHOENIX: FOR BACK: 8.4 (BEST VALUE TO BUY)
IMPLIED PROBABILITY: 8.4 ODDS = $(1/8.4)*100 = 11.90\%$.
EXPECTED VALUE: FOR \$1: $(7.4*0.11)-(1*0.89) = -0.08$

THE DRAW: FOR BACK: 2.04 (BEST VALUE TO BUY)
IMPLIED PROBABILITY: 2.04 ODDS = $(1/2.04)*100 = 49.01\%$.
EXPECTED VALUE: FOR \$1: $(1.04*0.49)-(1*0.51) = -0.01$

TOTAL IMPLIED PROBABILITY FOR LAY: $38.75+11.90+49.01 = 99.66\%$

PROFIT FOR BOOKMAKER IS: $101.06\%-99.66\% = 1.4\%$

So regardless of which option bettors choose, in the long run, the bookmaker will make **1.4%** profit on the bets.

Therefore, The actual probability of each team and draw is having less than the implied probability of each team and for draw. So we can expect a negative expected value in the long run.

NOTE: Always look for the given odds are greater than fair odds i.e

ACTUAL PROBABILITY > IMPLIED PROBABILITY
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EXAMPLE :

The hosts Barcelona are on a 10 game unbeaten run in the League, winning 8 games and drawing 2. PSG on the other hand recorded 5 wins, 4 draws and 1 loss in their last 10 games.

Additionally, you choose to focus only on the games in the India Football League where Barcelona was home and PSG was away and you find that both teams played 5 games each in this category out of the total 10 League games that were previously stated.

Your data further states that Barcelona playing at home in this League won 4 matches, drew 1 and lost 0. PSG while playing away won 3, drew 1 and lost 1.

Your calculations for Actual Probability are as follows:

1. Barcelona winning at home = (No. of wins at home by Barcelona + No. of loses away by PSG) / (Matches by both teams)
 $(4 + 1) / 10 = 0.5$

This gives you an Actual Probability of **50%** and odds of **2.00** that Barcelona will beat PSG.

2. PSG winning away = (No. of wins away by PSG + No. of loses at home by Barcelona) / (Matches by both teams)
 $(3 + 0) / 10 = 0.3$

This translates to **30%** in Actual Probability and **3.33** odds that City will beat United.

Similar to the previous calculations your Actual Probability for a draw is **20%** which translates to **5.00** odds.

So total Actual Probability = **50% + 30% + 20% = 100%**

Bookmakers add a profit margin and list the odds on the website as **1.57** (for a Barcelona win instead of **2.00**), **5.58** (for PSG to win instead of **3.33**) and **4.31** for a draw (instead of **5.00**).

Converting the odds from decimal to percentage is done by dividing 1 by the odds and multiplying by 100% e.g. **1.57 odds = $(1/1.57)*100\% = 63.7\%$** . This is the implied probability.

Therefore, your implied probability for this match after adding a profit margin becomes **63.7%** (Barcelona), **17.9%** (PSG) and **23.2%** (for a draw) and this gives a total implied probability of **104.8%** which translates to a **4.8%** profit margin for the bookmaker.

So regardless of which option bettors choose, in the long run, the bookmaker will make **4.8%** profit on the bets.

By lowering odds for the favourites and boosting odds for the underdogs they make bettors believe that the favourites have a higher chance of winning than is the case (**50% vs. 63.7%** for Barcelona) which makes bettors believe that the underdogs have an even lower chance of winning than they thought (in this case PSG had an Actual Probability of **30%** of winning but **5.58** odds decreased that percentage to **17.9%**).

From an alternate angle following the Actual Probability of **50%** (Barcelona win), **30%** (PSG win) and **20%** (draw), this means that there is a **50%** chance of Barcelona winning the match and a **50%** chance of PSG winning or drawing (X2 double chance). But, the bookmakers will make you believe that Barcelona have a **63.7%** chance of winning, while PSG has a **17.9%** chance of winning and the game has a **23.2%** chance of ending in a draw meaning that the double chance (X2) only has a **41.1%** of happening instead of **50%**. Collectively, this implied information contributes to you deciding to bet on the favourites when they are not as favoured as you may think. Do not bet on the favourites every time.

NOTE: If someone bet with statistical analysis and some data science then with respect to Actual Probability and Implied Probability would be for them to bet on the selection where the **Actual Probability is greater than the Implied Probability.**

ACTUAL PROBABILITY > IMPLIED PROBABILITY
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