

The payoff diagram: reading the shape

THE PAYOFF DIAGRAM

The standard picture of an options position: profit and loss on the vertical axis, the underlying's price at expiry on the horizontal, drawn as a line whose shape is the position's whole character - the bend at the strike, the flat where the option is worthless, the slope where it tracks the underlying, and the point where the line crosses zero, which is the breakeven. Reading the shape is reading what a position does across every possible outcome, at a glance.

An option's payoff is non-linear - it bends - and the payoff diagram is how that bend is read. It plots what the position is worth at expiry across every underlying price, and its shape says everything about the position's character.

Reading a diagram's features

The bend at the strike: the payoff line changes slope at the strike - flat on one side (the option worthless), sloped on the other (tracking the underlying); the kink is the option's defining non-linearity, the thing shares' straight lines never have. The flat: where the option expires worthless, the payoff is a horizontal line at minus the premium (for a buyer) - the limited-loss region, the asymmetry's good half made visible. The breakeven: where the line crosses zero - strike plus premium for a long call, strike minus premium for a long put (module 1) - the point the diagram marks and the underlying must reach. The slope beyond: where the option is in the money and gaining, the line slopes with the underlying - one-for-one deep in the money, the share-like region.

Why the shape is the position

The diagram makes an options position legible in one picture: a long call bends up from a flat loss floor through the breakeven into open gain; a short call is its mirror, flat premium income turning into unbounded loss; a long put bends the other way; a short put the mirror of that. The four shapes of module 1, drawn - and every complex position of module 5 is these shapes added together into a new line whose bends and flats say exactly what the combination does. Reading the diagram is reading the position without arithmetic: where it profits, where it loses, where it is capped, and where it is exposed.

The diagram as the analytical tool

Because options payoffs are non-linear, the diagram does work no number can: it shows the whole outcome distribution's shape at once, where a single figure like expectancy (which module 6 finds breaks on these shapes) shows only an average that hides the bends. The payoff diagram is the options trader's native picture - the way the four shapes and their combinations are actually understood - and every later module draws on it: module 4 reads the maximum loss off it, module 5

builds structures by adding shapes, module 6 buckets outcomes along it. Learn to read the shape, and options stop being abstract.

Check your understanding

1. What is the 'bend' in a payoff diagram?

- a. A drawing error
- b. The kink at the strike where the payoff line changes slope - flat on one side, sloped on the other; the option's defining non-linearity that shares' straight lines never have
- c. The commission

Answer: b. The bend at the strike is the option's non-linearity made visible. Every complex position is these bends added together - and reading the shape is reading the position.

2. Why does the diagram do work no single number can?

- a. It is more precise
- b. Options payoffs are non-linear, so the diagram shows the whole outcome distribution's shape at once, where a figure like expectancy shows only an average that hides the bends
- c. It includes the premium

Answer: b. A number averages; the shape reveals. This is why the payoff diagram is the options trader's native picture - and why module 6 finds expectancy breaks on these shapes.