Portfolio Greeks and hidden correlation

> **PORTFOLIO GREEKS**
>
> An options book's real risk is its aggregate Greeks - total delta, gamma, theta and vega - not the sum of its positions read separately, because positions correlate through their shared underlyings and shared volatility exposure. A book of options that looks diversified across names can carry a large net vega (one volatility bet) or a large net delta (one directional bet) hidden in the aggregate - the correlation-to-one risk, in the Greek dimension.

A share portfolio's risk is read through its correlations; an options book's is read through its aggregate Greeks, which is where its hidden correlations live. This lesson aggregates the dashboard of lesson 6 across the whole book.

The aggregate view

Total delta: the book's net directional exposure - several positions that each look modest can sum to a large directional bet, or cancel to less than they appear; only the aggregate says which.Total vega: the book's net volatility exposure - and the one most often hidden, because a book diversified across underlyings can still be uniformly long or short volatility, one big vega bet wearing many names.Total theta and gamma: the book's daily decay bleed or income, and how fast its delta shifts - the aggregate carry and the aggregate instability, read across every position at once.

The hidden correlations

Options positions correlate in ways shares do not. A vega correlation: options on different underlyings are all exposed to volatility, and in a market-wide volatility event they move together - so a book long options across many names is long volatility once, and a volatility collapse hits all of it. A delta correlation: options expressing the same directional or volatility view across correlated underlyings sum to a concentrated bet. And an event correlation: options positioned around the same event (an earnings season, a macro decision) share its outcome. The aggregate Greeks reveal these; the position-by-position view hides them, exactly as reading shares individually hid their sector correlation.

Sizing the aggregate

The options risk plan caps the aggregate Greeks, not just each position: a total vega limit (so the book is not one large volatility bet), a total delta limit (so it is not one large directional bet), and an eye on the shared-event exposure that clusters the risk. The correlation-to-one lesson, in the Greek dimension: a book that looks diversified across names can be concentrated in volatility or direction, and only the aggregate Greeks show it. Reading the book through its total Greeks - and capping them - is how an options portfolio's real, correlated risk is managed, where reading positions separately would miss the concentration entirely.

Check your understanding

1. Why is total vega the most often hidden portfolio risk?

a. Vega is small

b. A book diversified across underlyings can still be uniformly long or short volatility - one big vega bet wearing many names, hit all at once by a market-wide volatility event

c. Vega does not aggregate

Answer: b. Options on different underlyings all carry volatility exposure. A book long options across many names is long volatility once - the correlation-to-one risk, in the Greek dimension.

2. What does reading positions separately miss?

a. The commission

b. The hidden correlations: a book that looks diversified across names can be concentrated in volatility or direction, visible only in the aggregate Greeks

c. The strike prices

Answer: b. Options correlate through shared underlyings and shared volatility exposure. Only the aggregate delta and vega show the concentration - the position-by-position view hides it.