Para Bellum Advisors

PRACTITIONER PAPER

Options as Risk Tools

What You're Actually Trading

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Paper 1 of 3: Options as Risk Tools

Series: Options, Volatility, and Convexity in Institutional Portfolios

Executive Summary

Most institutions that use options believe they understand them. They understand the payoffs. They can describe a call. They know that puts provide protection.

What they often do not understand is what they are actually trading.

Options are not inherently bets on direction, although they can be structured that way if that is the intent. They are not simple insurance policies. They are bundles of risk exposures, each with a cost or an earnings profile, each responding differently to changes in the market. When you buy an option, you are taking a position on volatility, time, convexity, and direction simultaneously. When you sell one, you are doing the same thing in reverse.

That framing changes everything. It changes how you evaluate whether an option is cheap or expensive. It changes how you think about hedging. It changes what you expect from a strategy and when you admit it is not working.

This paper is not a trading manual. It is written for institutional decision-makers, investment and treasury professionals who use options within portfolios and want a clearer framework for understanding what they own and what it costs.

The central argument is straightforward:

1. Options are risk tools, not strategies. Every option position is a combination of specific, quantifiable exposures.
2. Volatility is the core asset. Most users think they are trading direction. They are mostly trading volatility.
3. Convexity has a cost, and that cost must be justified. The premium paid for an option is not a fee; it is the price of a specific portfolio characteristic.
4. Most option failures are not failures of complexity. They are failures of understanding what was actually being traded.

This paper lays the conceptual foundation over a three-paper series. Paper 2 develops the case for treating volatility as a standalone asset class. Paper 3 addresses convexity budgeting and portfolio-level option management.

> ***The effective use of options is not about predicting markets. It is about structuring exposures to survive them.***

1. The Misunderstanding

Options get taught from the wrong end.

The standard introduction goes like this: a call gives you the right to buy at a fixed price; a put gives you the right to sell. Here is the payoff diagram. Here are some strategies. Here is why buying a covered call generates income.

That framing is not wrong. But it produces a specific kind of user: someone who thinks in terms of structures and payoffs rather than exposures and costs. That user tends to make a predictable set of mistakes.

The trading desk framing is different. On a trading desk, nobody talks about strategies in the way textbooks present them. They talk about being long gamma or short vega. They talk about whether implied vol is rich or cheap relative to realised. They talk about theta bleed and whether the carry on a position is justified. The instrument is secondary. The exposure is primary.

That distinction matters enormously in practice.

An institution that buys a put spread for downside protection has done something useful. But if the team does not know that they are now long gamma and long vega, they will not understand why the position is losing value in a low-volatility drift down. They will not know when to adjust. They will not know what conditions make the position work and what conditions destroy it slowly before it ever has a chance to help.

This paper is not a mathematics paper. The Greeks are introduced in Section 3, but the point is not to produce better formula users. The point is to reframe how options are understood.

> ***Nobody trades options. They trade exposures. The instrument is the vehicle. The exposure is the point.***

There is also a gap between theory and practice that most primers do not address honestly. Theoretical pricing assumes continuous markets, constant volatility, and no jumps. None of those things are true. Models are interpolation tools used to communicate about options in a common language. Prices are set by supply and demand (and how much dealers can extract on spreads).

This matters because the most important driver of option prices, volatility, is not observable. It is implied from market prices using a model. The result is that when you buy an option, you are partly taking a view on whether the market's implied volatility estimate is correct. Most users do not realise that is the trade they are making.

2. What an Option Actually Is

An option is a contingent claim. The buyer pays a premium upfront in exchange for a right, not an obligation. That right has value only if certain conditions are met.

A call option gives the buyer the right to purchase an underlying asset at a predetermined price, the strike, on or before a specified date. A put option gives the buyer the right to sell at the strike. The seller of either instrument receives the premium and is obligated to perform if the buyer exercises.

The key feature is asymmetry.

For the buyer of a call: if the underlying rises above the strike, gains are theoretically unlimited. If it does not, the loss is capped at the premium paid. The downside is finite; the upside is open-ended.

For the seller of that same call: the premium received is the maximum gain. If the underlying rises sharply, losses can be very large. The upside is capped; the downside is open-ended.

This asymmetry is not a quirk. It is the point. Options allow portfolios to be shaped asymmetrically. You can participate in gains while limiting losses, or collect premium while accepting bounded tail risk, or create exposures that respond differently in different market environments. None of that is possible with linear instruments.

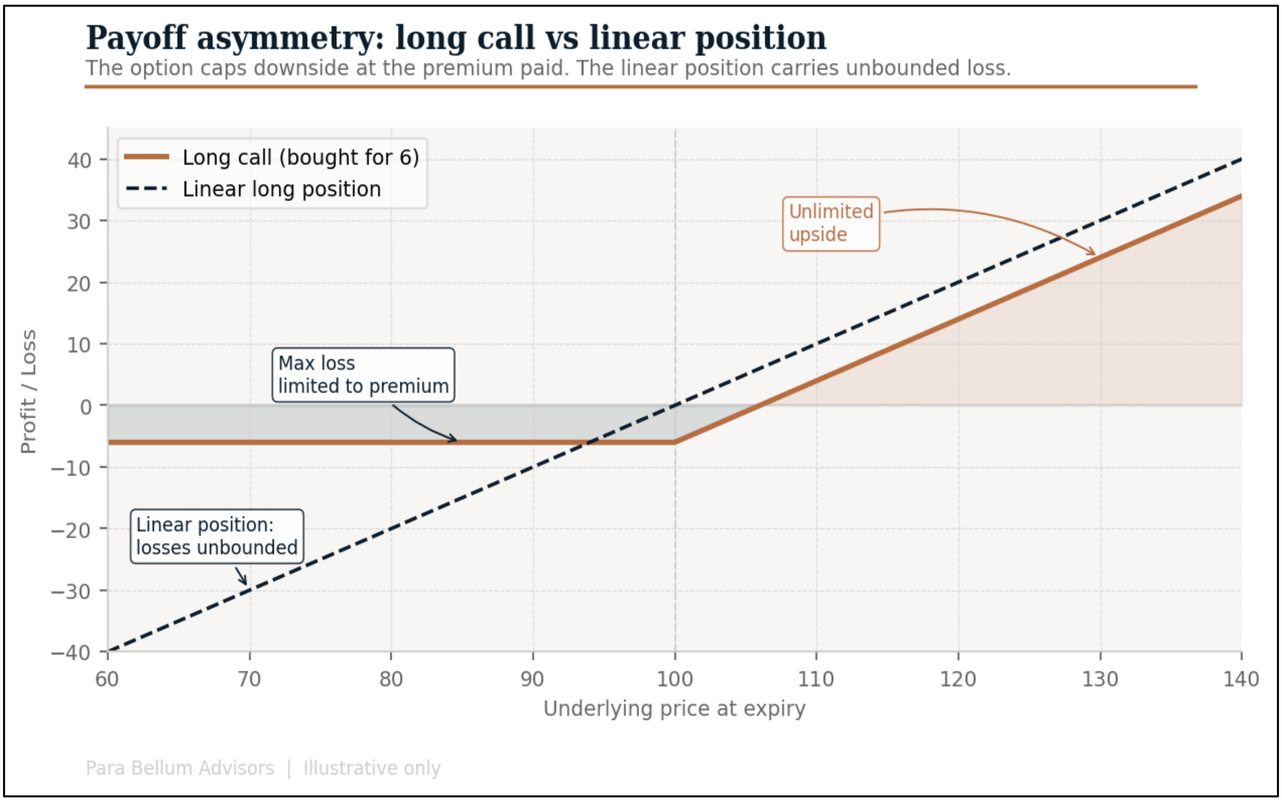

Figure 1: Long call payoff vs linear position. The option caps downside at the premium paid while preserving full upside participation.

2.1 The concept of convexity

The word convexity describes how an instrument responds non-linearly to changes in the underlying. A linear instrument like a futures contract gains or loses value in direct proportion to the move in the underlying. An option does not.

As the underlying moves in favour of an option buyer, the rate of gain increases. As it moves against them, the rate of loss slows. That curvature in the payoff profile is convexity, and it is the most valuable characteristic options introduce into a portfolio.

Convexity is not free. It is paid for through the premium. The buyer of an option is, at its core, paying for the right to participate in large moves while being protected from large losses. Understanding how that cost is structured, and whether it is justified, is the central challenge in using options well.

> ***Options introduce convexity into a portfolio. That convexity has a cost. Whether that cost is worth paying depends entirely on what the portfolio is trying to achieve.***

3. From Instruments to Exposures: The Greeks

The Greeks are the language of options risk. They measure how an option's price changes in response to changes in the underlying, time, volatility, and interest rates. More importantly, they describe what a portfolio actually owns when it holds options.

This matters because no sophisticated user of options thinks in terms of a single instrument. They think in terms of a book of exposures. Long gamma here. Short vega there. Net theta positive. The question is always the same: what exposure does this position carry, and what does that exposure cost?

Greek	Exposure	What it costs / earns
Delta	Directional	Gains or losses as the underlying moves
Gamma	Convexity	Provides the ability to monetise movement, but only if realised volatility exceeds what was implied and the position is actively managed
Theta	Time decay	Paid daily when you own convexity; collected when you sell it
Vega	Volatility	Long when you own options; short when you have sold them
Rho	Interest rates	Minor for most strategies; material for long-dated positions

3.1 Delta: the directional exposure

Delta measures how much an option's price changes for a one-unit move in the underlying. A delta of 0.5 means the option gains or loses approximately half as much as the underlying for small moves. Delta is also dynamic – it changes as the underlying moves. That rate of change is gamma.

3.2 Gamma: the convexity

Gamma measures how delta changes as the underlying moves. When you are long gamma, your delta increases as the market moves in your favour and decreases as it moves against you. You get more exposure when things are going right and less exposure when they are going wrong. That is the mechanical expression of convexity.

Gamma is also what makes short option positions dangerous. When you are short gamma, you accumulate exposure in the wrong direction as the market moves. That dynamic is what turns a short vol carry trade into a disaster during a vol spike.

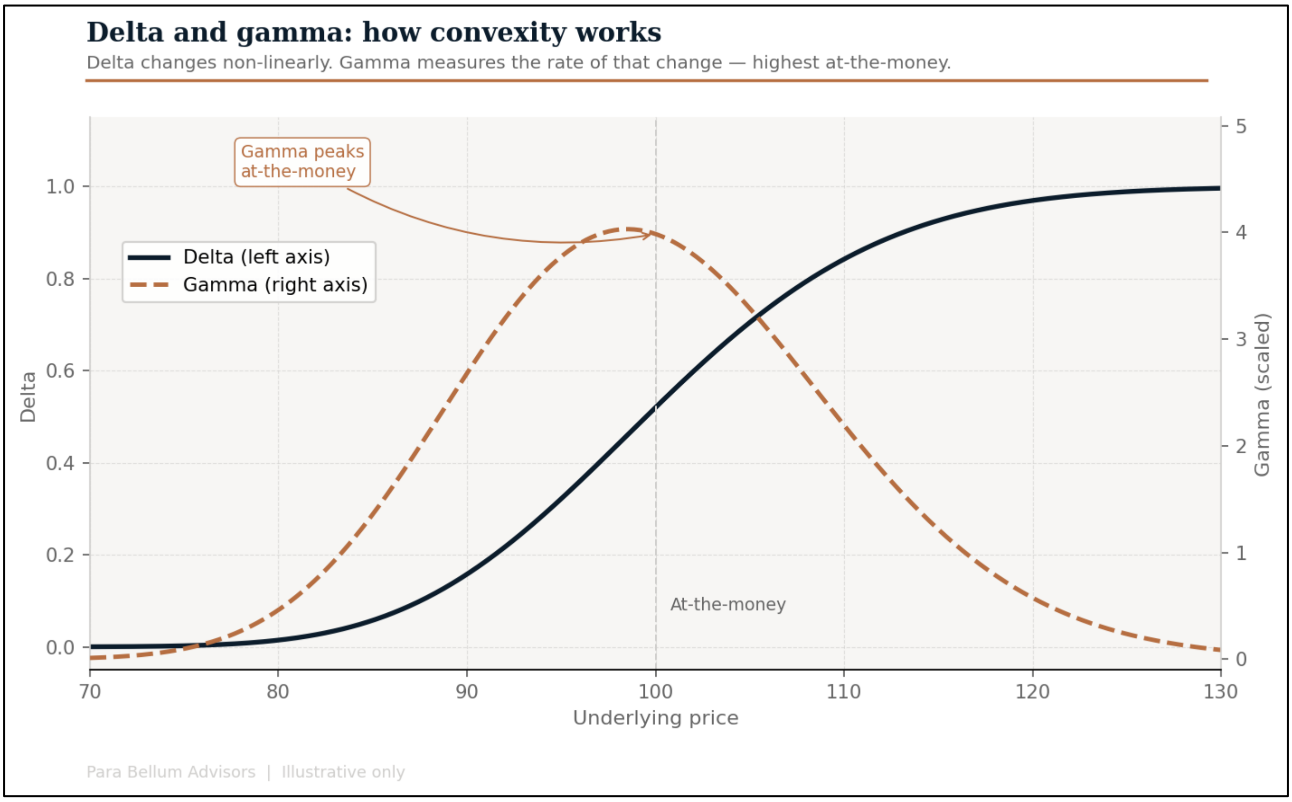

Figure 2: Delta and gamma curves for a 3-month ATM call option. Gamma peaks at-the-money, where convexity is most concentrated.

> ***Long gamma gives you the ability to monetise from large moves in either direction (typically through active rebalancing or sufficiently large, realised moves). Short gamma means you suffer from them. Position-sizing relative to that exposure is what separates disciplined options use from a carry trade with hidden tail risk.***

3.3 Theta: the cost of holding convexity

Theta measures the rate at which an option loses value as time passes, all else being equal. For the buyer of an option, theta is a constant drag. Every day that passes without the expected move, the option loses value. For the seller, theta is earnings – collected daily as long as the underlying does not move violently enough to overwhelm the premium collected.

The relationship between gamma and theta is one of the central tensions in options. Long gamma and short theta go together: you own convexity, but you pay for it through time decay. Short gamma and long theta also go together: you collect premium through time, but you are exposed to large moves.

3.4 Vega: the volatility exposure

Vega measures the sensitivity of an option's price to changes in implied volatility. A position with high vega will gain or lose significantly as market expectations of future volatility change, even if the underlying does not move at all.

When you buy an option, you are long vega. If implied volatility rises after you buy, the option becomes more valuable even if the underlying has not moved. If implied volatility falls, the option loses value even if the underlying has not moved. This means that timing matters enormously – buying protection after a volatility spike means you are long vega at a point where volatility is likely to mean-revert.

3.5 The point

Every option strategy, however complex it appears, is a combination of these exposures. A collar is long put gamma and long put vega, short call gamma and short call vega, with theta that partially offsets between the two legs. A straddle is long gamma and long vega with significant theta cost, direction-neutral unless the move is large enough to overwhelm the premium.

When a strategy is not performing, the question should not be 'why is the put spread not working?' It should be: 'which exposure is working against me?' That question has a specific answer. The generic question does not.

4. Volatility: The Core Driver

If there is one concept that separates users who understand options from those who do not, it is volatility. Specifically, it is the distinction between implied volatility and realised volatility, and what that gap means for the economics of every option trade.

4.1 Implied versus realised volatility

Implied volatility is what the market is pricing into an option – the level of future volatility that, when inserted into a pricing model, produces the observed market price. It is not a prediction. It is a market-clearing price for uncertainty.

Realised volatility is what the underlying actually does. The gap between the two is the volatility risk premium. Historically, implied volatility has tended to run above realised volatility on average, but that premium is not constant and can compress or invert entirely in stressed or transitioning market regimes. This occurs because buyers of options are willing to pay above expected value for the protection they provide.

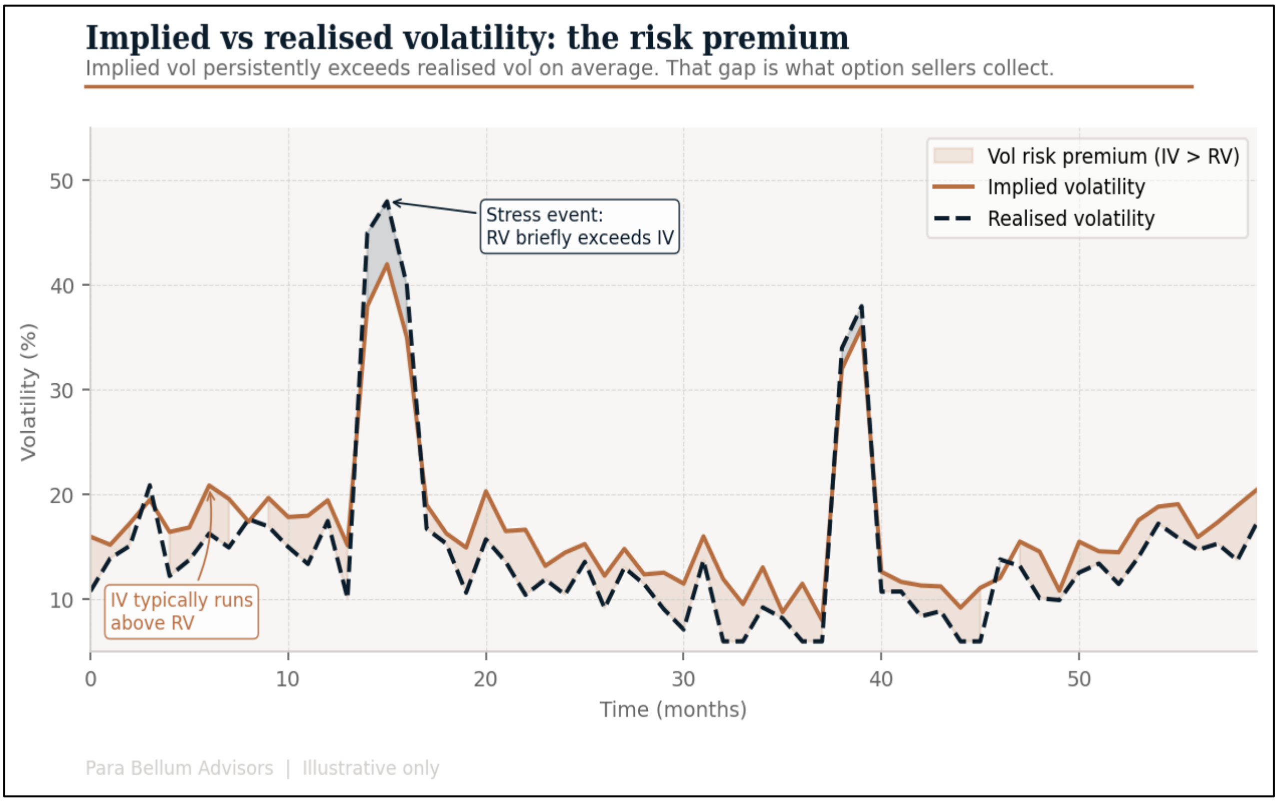

Figure 3: Implied vs realised volatility over time. The shaded area represents the volatility risk premium – what option sellers collect on average. Spikes occur where realised vol briefly exceeds implied.

For option sellers, this premium is the economic justification for short vol strategies. For option buyers, it is the constant headwind. Understanding which side of this gap you are on, and whether the current premium is reasonable, is fundamental to evaluating any option trade.

4.2 Volatility as an asset

Volatility is not just a parameter in a pricing model. It is something you can be long or short. When you buy an option, you are long volatility. When you sell one, you are short volatility. That is the trade, regardless of what the structure is called.

An institution that consistently sells covered calls for yield enhancement is running a systematic short volatility position. The premium collected is the return for bearing that risk. This is not 'income' in isolation – it is long equity beta with a systematic sale of upside convexity, repackaged as yield. That is fine, as long as the institution understands it is what they are doing. Many do not.

> ***You cannot be long an option without being long volatility. You cannot sell an option without being short volatility. The structure is secondary. The vol position is primary.***

4.3 Skew and the structure of volatility

Volatility is not uniform across strikes or maturities. In equity markets, downside strikes typically carry higher implied volatility than upside strikes. This is structural: there is persistent institutional demand for downside protection, and market makers charge a premium to provide it. The shape of volatility is also asset-specific – FX, rates, credit and, commodities behave differently from equities in terms of skew, carry and mean reversion.

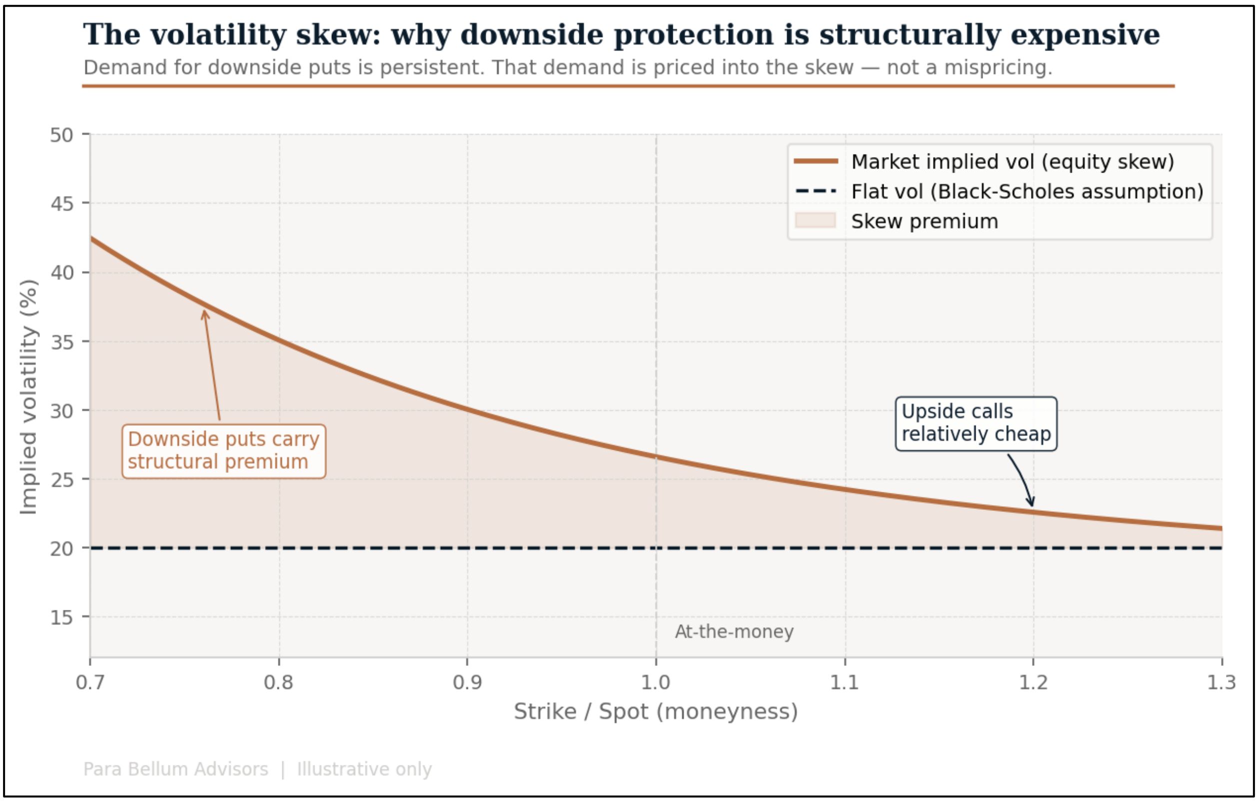

Figure 4: The volatility skew. Downside puts carry a structural premium above at-the-money vol due to persistent institutional demand. This is not a mispricing – it is the market clearing price for protection.

Buyers of puts are not just paying for realised vol; they are paying a structural premium for an instrument that is consistently in demand. Understanding skew explains why the naive answer to 'buy some puts for protection' is often economically poor.

4.4 Models are tools, not truth

Black-Scholes and its descendants are pricing frameworks, not descriptions of reality. They are useful because they provide a common language. But prices are set by supply and demand, not by models. The model is used to translate between price and volatility. Implied volatility itself is a market-clearing number, not a model output. In practice, this matters because P&L is driven by how positions are marked – changes in implied volatility – not by realised outcomes in the short term.

The practical implication is that implied volatility can be mispriced relative to any reasonable estimate of future realised volatility. That mispricing is the opportunity. Identifying it is the skill. Paper 2 in this series addresses that in detail.

5. Strategy Framework: Organised by Risk Intent

Instead of listing strategies by name, it is more useful to categorise them by the risk intent they serve. That intent determines the exposure profile: what you are long, what you are short, and what it costs on a daily basis.

There are four meaningful categories.

Intent	What you own	Cost structure	Use case
Directional convexity	Long gamma, long vega, short theta	Running premium cost; earns on large moves	Asymmetric directional views
Volatility trading	Direction-neutral; long or short vol	Depends on positioning; can be theta positive or negative	Trading realised vs implied movement
Income and carry	Short gamma, short vega, long theta	Upfront premium; exposed to tail events	Yield enhancement; premium collection
Hedging and protection	Long gamma, long vega, short theta	Cost of premium; decays without an event	Portfolio protection; drawdown management

5.1 Directional convexity

Long calls, long puts, vertical spreads. The exposure profile: long gamma, long vega, short theta. You are paying premium every day for the right to benefit asymmetrically from a large move. The failure mode is buying directional convexity when implied vol is already elevated – you are long vega at the worst time.

5.2 Volatility trading

Direction-neutral strategies where the primary exposure is to volatility itself. Straddles and strangles are the basic instruments. The position is indifferent to direction; it needs movement. More sophisticated volatility trading involves term structure plays, skew trades, and dispersion strategies.

> ***You are not predicting market direction. You are predicting movement. That is a different trade and requires a different kind of analysis.***

5.3 Income and carry

Covered calls, short puts, iron condors. The exposure is short gamma, short vega, long theta. The risk is tail risk. When volatility spikes, short vol positions lose quickly and in large amounts. The premium collected over months can be erased in days. The problem arises when institutions run short vol carry positions without explicitly recognising that is what they are doing.

5.4 Hedging and protection

Protective puts, collars, put spreads. Long gamma, long vega, short theta. The central problem is timing and cost. A superannuation fund buys a 3-month 95% put and thinks it has bought simple protection. What it has actually bought is long vega at an expensive time, short theta from day one, and protection whose effectiveness depends heavily on when the move occurs.

The other problem is monetisation of gains – a put that moves deeply in the money during a market dislocation has value that will evaporate as the market recovers if it is not converted to cash. This is one of the most common failure modes in institutional hedge programmes.

6. Portfolio Applications

Options are often evaluated at the instrument level. That is the wrong level of analysis for portfolio management. The relevant question is how options change the behaviour of the portfolio as a whole.

6.1 Overlay strategies

Overlay strategies use options to modify the risk profile of an existing portfolio without changing the underlying holdings. Equity protection overlays should be evaluated not on whether the hedge event occurs, but on whether the cost of the overlay is justified by the risk it removes and whether there is a coherent plan for monetising gains.

Yield enhancement overlays are where misuse is most concentrated. A covered call programme sells off the right tail of the return distribution in exchange for premium. In a strongly trending equity market, the overlay systematically underperforms the unhedged portfolio. Institutions need to understand they are not earning free income; they are selling volatility.

6.2 Capital efficiency

Options can provide exposures that would otherwise require significant balance sheet. The capital efficiency argument is real, but it requires careful accounting. The premium paid for an option is a real cost, not a reduction in capital usage. The relevant comparison is between the capital consumed by the option and the capital that would be consumed by the equivalent position in the underlying, adjusted for the asymmetric return profile.

6.3 Convexity budgeting

The most underdeveloped concept in institutional options use is convexity budgeting, treating the premium spent on options as an explicit portfolio allocation rather than a transaction cost. Most institutions do not have a convexity budget. They make option decisions reactively – buying protection after a scare, selling calls when they feel the market is extended.

A convexity budget changes this. It sets aside a defined portion of the portfolio's return target for option premium, deployed systematically rather than reactively. The portfolio manager treats the convexity budget the same way they treat the allocation to any other asset.

> ***A convexity budget is not a hedge programme. It is a structural decision about how much of the portfolio's return should be allocated to shaping the distribution of outcomes rather than maximising the expected return.***

Paper 3 in this series develops the convexity budget framework in detail.

6.4 Drawdown management

Using convexity to manage drawdowns is fundamentally different from trying to predict corrections. The path of returns matters as much as the magnitude, and options are path-dependent instruments. An institution that holds convexity through a drawdown has options:

1. hold the protection, monetise the gains and redeploy capital at distressed prices, or
2. use the protection as a negotiating position with stakeholders.

None of those options are available to an institution that did not own the convexity.

7. Why Most Option Strategies Fail

The majority of option losses in institutional portfolios are not due to complexity. They are due to a small number of errors that repeat predictably because the underlying exposure framework is not clear.

7.1 Buying volatility when it is already elevated

An institution experiences a market scare, decides it needs more protection, and buys puts or put spreads at a point when implied volatility has already spiked. The protection is expensive in premium terms and expensive in vega terms: the buyer is now long vega with volatility likely to mean-revert.

The correct time to buy protection is when volatility is low and the cost of convexity is reasonable – typically when the portfolio feels safest and the case for protection is hardest to make internally.

7.2 Selling volatility without explicitly owning the tail risk

Running a systematic short vol strategy without a clear accounting of the tail exposure that has been taken on. Premium collection feels like income. It is not income; it is compensation for bearing risk. Short vol strategies need to be sized and managed as the risk positions they are.

7.3 Ignoring theta bleed

Convexity has a running cost. Every day that passes without a significant move, a long option position loses value. Over weeks and months, that decay compounds.

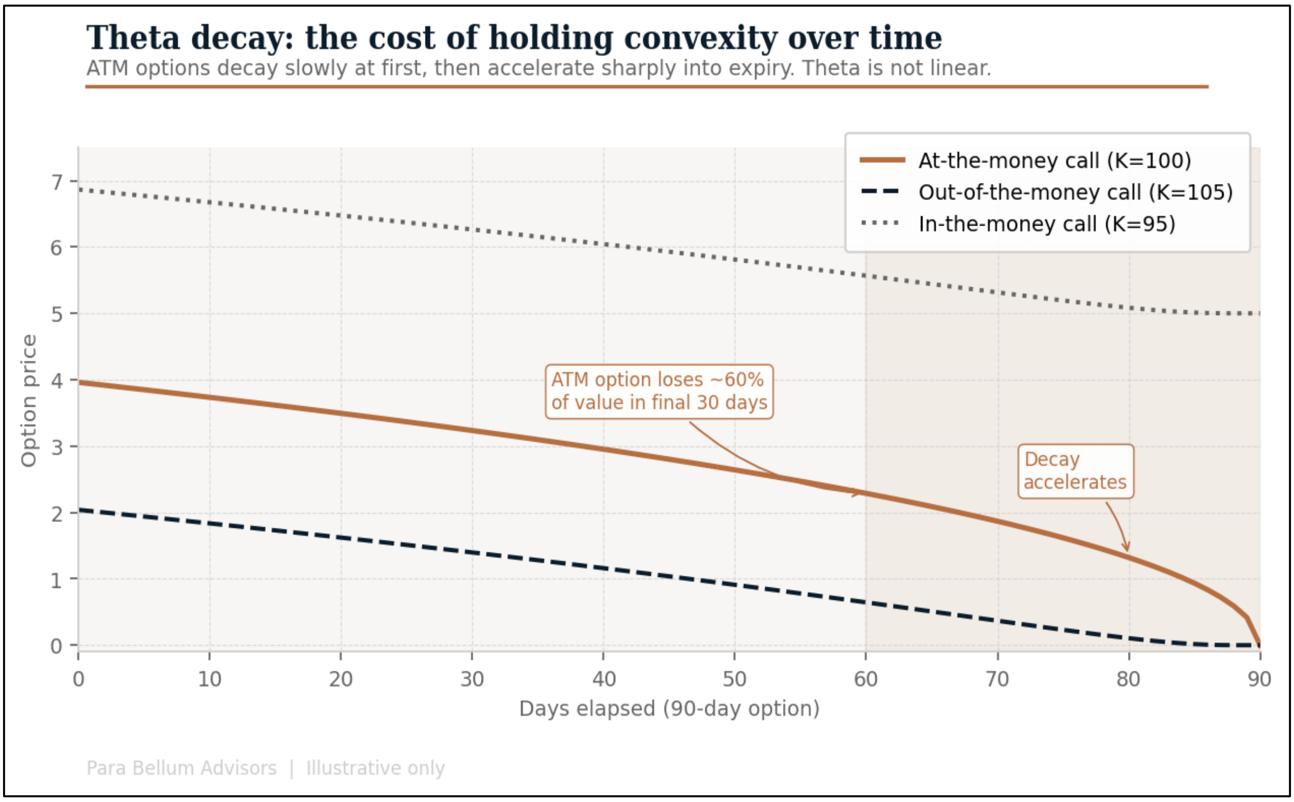

Figure 5: Theta decay for a 90-day option. ATM options decay slowly early in their life, then accelerate sharply in the final 30 days. The decay is not linear – it is a structural cost that compounds.

An institution that holds long option positions without tracking this cost will consistently be surprised by how much the portfolio has paid for protection that was never needed.

This is an argument for holding options with clarity about what they cost and what conditions justify the cost.

7.4 Misreading skew

Downside skew in equity markets is a structural fact, not a mispricing. Puts are expensive because they are persistently in demand from institutional buyers who need to demonstrate downside protection.

The question is never just 'is this put cheap or expensive?' It is 'is this protection worth the cost given the specific risk profile of this portfolio?'

7.5 Execution reality

Models price options in a world where liquidity is always available and bid/ask spreads are narrow. For OTC structures, long-dated options, and anything in stressed markets, the picture is different.

Bid/ask spreads widen materially under stress, precisely when you most want to trade. Liquidity is not just a function of volume; it is regime-dependent. In stressed markets, skew can gap, liquidity fragments, and hedging becomes materially more expensive or unavailable.

In extreme conditions, counterparties may quote materially wider bid/offer spreads or not quote at all.

Execution cost needs to be modelled as a real variable, not a rounding error.

8. Conclusion: Reframing Options

Options are not strategies. They are risk tools that shape portfolio exposure in specific, measurable ways.

Every option position is a combination of directional exposure, convexity, time decay, and volatility sensitivity. Understanding which of those is the primary driver of a position, what it costs, and what conditions make it work is the only reliable foundation for using options well.

Volatility is the core asset. The majority of option decisions are ultimately decisions about whether implied volatility is a reasonable price for the uncertainty being priced. Getting that question right more often than the market does is the entire game.

Convexity has a cost, and that cost must be justified against a clear portfolio objective. Protection that costs 100 basis points per year is worth it for a portfolio that cannot survive a 25% drawdown. It is not worth it as a generic hedge against unspecified risk.

Most option strategy failures are not failures of sophistication. They are failures of framing. Buying vol after a scare, selling it without owning the tail risk, ignoring theta, misreading skew: these are not technical errors. They are errors in understanding what is being traded.

> ***The effective use of options is not about predicting markets. It is about structuring exposures to survive them.***

Paper 2 in this series, Volatility as an Asset: Buying, Selling, and Mispricing It, develops the volatility framework in full. Paper 3, Convexity in Portfolios: Cost, Budgeting, and When It Fails, addresses how institutions should allocate to convexity as a portfolio decision.

Further Reading

Para Bellum Advisors publishes practitioner papers and CIO Briefs focused on real-world portfolio construction, risk and capital efficiency:

www.parabellumadvisors.com/insights/

About Para Bellum Advisors

Para Bellum Advisors is an independent advisory firm specialising in derivatives structuring, structured finance, balance sheet efficiency, and capital optimisation for institutional investors and corporate treasury teams.

The firm works with lean investment and treasury teams managing complex, multi-asset exposures – long-dated assets, illiquid portfolios, and non-standard risk profiles – where structural precision makes a material difference to outcomes.

Its engagements typically involve designing and re-engineering hedges across FX, rates, credit, equity, and volatility; identifying and releasing trapped capital; and providing embedded structuring capability where permanent headcount is neither practical nor warranted.

Para Bellum does not distribute products or earn transaction volume. Its value is in structure: how exposures are designed, how capital is consumed, and how portfolios behave when conditions deteriorate.

The firm is practitioner-led, drawing on three decades of experience across trading, structuring, and portfolio management in banks, asset managers, and institutional balance sheets in Asia-Pacific and global markets.

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