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THE WORLD'S EVENTS, PRICED IN US MARKETS

RESEARCH PAPER 03 · VOLATILITY

Reading the SPX Term Structure for Regime Change

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ABSTRACT

The volatility term structure is usually read as a sentiment gauge. It is more useful as a description of what the market believes about the *timing* of risk, and its shape carries information that a single volatility level cannot. This paper sets out what the curve is, what each of its shapes implies mechanically, why inversion is the signal that matters to anyone carrying short-premium risk, and the specific reasons the signal fails. It is a framework paper. It contains no forecast and no return figures.

1 What the curve is

For any underlying with options listed across multiple expiries, each expiry carries its own implied volatility. Plotted against time to expiry, those points form a curve. That is the term structure, and it is a statement about when the market expects movement, not merely how much.

Two curves with identical thirty-day volatility can imply completely different distributions. One may be flat, saying the market expects the same conditions for a year. The other may be steeply upward sloping, saying conditions are calm now and are expected to deteriorate. A single volatility reading cannot distinguish these. The curve does.

A volatility level tells you how much the market expects. The curve tells you when it expects it, and when is usually the more actionable of the two.

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2 The three shapes

Upward sloping, the ordinary state

Near-dated volatility below far-dated. This is the resting state of an equity index curve, and the reason is structural rather than sentimental. Uncertainty accumulates with horizon: more can happen in a year than in a month, and more of what can happen is unknown. An upward slope is the curve saying nothing is imminent.

For a seller of near-dated premium this shape is the operating environment, and it carries a specific hazard. The front is the cheapest part of the curve, so the premium collected there is thin, and thin premium is exactly what tempts an operator into size to compensate.

Flat, the transition

Near and far converge. Something has raised near-term expectations without changing the long-run view, or a long-run concern has been pulled forward. Flat is not a state so much as a passage between the other two, and it is the shape that most often precedes the third.

Inverted, the regime

Near-dated volatility above far-dated. The market is saying the risk is now, and that it expects conditions to normalise beyond the immediate horizon.

Inversion is not a mild version of steepening. It is a categorical change in what the curve is describing, and for anyone carrying short-premium risk it is the shape that matters, for a reason set out in section 4.

TABLE 1. WHAT EACH SHAPE IMPLIES

SHAPE	THE MARKET IS SAYING	CONSEQUENCE FOR A SHORT-PREMIUM BOOK
Upward sloping	Nothing is imminent; uncertainty accumulates with horizon	Ordinary conditions. Front premium is thin, and thin premium invites size
Flat	Near-term expectations have risen, or a long-run concern has been pulled forward	Transitional. The relationship between tenors is no longer stable
Inverted	The risk is now, and conditions are expected to normalise later	Front-dated positions are marked against fastest, and hedges further out move least

Illustrative. Descriptive of the ordinary interpretation of each shape, not a rule and not a prediction.

3 Why the shape carries information the level does not

Consider two moments with the same thirty-day implied volatility. In the first, the curve slopes upward from that point. In the second, it slopes down.

The first is a market that regards current conditions as ordinary and the future as uncertain in the usual accumulating way. The second is a market that regards current conditions as the problem. The same thirty-day number is carrying opposite meanings, and a process that monitors the level alone cannot tell them apart.

This is the practical case for reading the curve rather than the index that summarises it. A single volatility figure is a projection of a multi-dimensional object onto one number, and the discarded dimension is the one containing the timing.

4 Why inversion matters to a seller

The reason inversion is the shape worth watching is mechanical, and it concerns hedges rather than the positions being hedged.

A short-premium book is typically written in the front, where decay is fastest. Protection is typically bought further out, where it is cheaper per unit of time and does not need constant replacement. Under an upward sloping curve that construction is coherent: both legs sit on a curve whose parts move broadly together.

When the curve inverts, they stop moving together. The front, where the short positions live, rises hardest. The back, where the protection lives, rises least or falls. The book is therefore marked against on the leg it is short and receives less than expected on the leg it is long, at the same moment.

An operator reading a single net volatility exposure will not see this coming, because that figure treats a unit of front-dated volatility and a unit of far-dated volatility as the same unit. In an inversion they are emphatically not. This is the specific mechanism by which a book that appeared hedged discovers it was hedged against a parallel move in a curve that did not move in parallel.

A hedge placed on a different part of the curve from the risk is a hedge against the curve moving in parallel. Inversion is the event where it does not.

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5 Why the signal fails

Four reasons, and they are sufficient to disqualify inversion as a standalone trigger.

It is coincident, not leading. The curve typically inverts because something has already happened. By the time the shape is unambiguous, the repricing has largely occurred, and a book that was going to be hurt has been.

It inverts without consequence. Scheduled events with binary outcomes routinely invert the front of the curve and resolve without incident. An operator who treats every inversion as a regime change stands aside frequently and for nothing, and the cost of that is real even though it never appears as a loss.

Definition sensitivity. Whether the curve is inverted depends on which tenors are compared and which measure is used. Reasonable choices disagree at exactly the ambiguous moments where a clear answer would be most valuable.

Reflexivity. The signal is widely watched. Behaviour conditioned on a widely watched signal changes the signal's behaviour, and there is no reason to assume its historical relationship to subsequent outcomes is stable.

6 What the curve is actually for

Given those failures, the honest use is narrower than the literature suggests, and more useful.

The curve is not a timing tool. It is a description of the environment a book is currently operating in, and its main value is in what it says about the *relationship between the tenors a book is exposed to*, which is a question about the book's own construction rather than about the market's direction.

Three questions it answers well:

- **Are the legs of this book on parts of the curve that have been moving together?** If not, the hedge is weaker than the position sizing assumes.
- **Is the premium available in the front compensation for risk, or compensation for being early?** An inverted front pays more precisely because the market expects the near term to be difficult.

- **Has the shape changed since this book was sized?** A book sized under one curve and carried into another has had its risk changed without a single transaction.

7 What would have to be true

For the term structure to be worth monitoring operationally, one thing has to hold: the relationship between tenors has to be stable enough in ordinary conditions that a change in it is informative.

If tenors move together most of the time, then a divergence carries information and is worth acting on. If the relationship is unstable in ordinary conditions too, then divergence is noise and reading it is an expensive habit.

The framework here does not resolve that question, and an operator should test it on their own instruments rather than accept it. What the framework does claim is narrower and more defensible: that a book whose short leg and hedge leg sit on different parts of the curve carries a risk that a single net volatility figure does not report, and that this is true whether or not the curve turns out to be a useful signal for anything else.

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Nothing in this paper is a forecast or a statement about the future direction of any index, volatility measure or price. Strategies referred to involve the sale of options, where losses can substantially exceed the premium received and, in some configurations, the capital committed.

No return figure, target or expected outcome is stated or implied. Any tables are illustrative and are provided to show a mechanism, not to describe a result. Past performance is not a reliable indicator of future performance.

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