Technical Deep Dive: GammaBot - Momentum and Beta Driven Options Strategy

Giacomo Checchi

April 10, 2025

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1 Foundations of the GammaBot Strategy

1.1 The Role of Momentum and Beta in Options Trading

The GammaBot employs a systematic approach to identifying high-probability call option trades based on the interplay of momentum and beta. The strategy selects weekly at-the-money (ATM) call options from a curated universe of high-beta U.S. tech stocks.

Momentum, in this context, refers to a short-term price acceleration — specifically a price gain of at least 1% over the most recent closing session. This serves as a basic signal that buying pressure is entering the market.

Beta, meanwhile, is used as a proxy for volatility. It measures a stock's sensitivity to market movements, relative to a benchmark (in this case, SPY). Stocks with beta above 1.5 are more volatile and are expected to amplify the broader market's movements — up or down. GammaBot uses beta to target names that are inherently more explosive, aiming to capture exaggerated gains on favorable momentum bursts.

Together, these two filters ensure that only stocks experiencing early signs of bullish continuation *and* possessing the structural capacity for large moves are considered for option entry.

The use of weekly options further magnifies the potential payoff due to gamma sensitivity. As these options approach expiration, their delta (and thus responsiveness to price movement) can change rapidly, producing outsized returns for even modest price extensions. However, this comes with increased risk from theta decay and illiquidity.

1.2 Risk-Reward Rationale and Strategic Positioning

The GammaBot is designed to exploit convexity in options pricing. By entering positions early in a potential breakout (as indicated by momentum), the bot attempts to ride the acceleration of delta and gamma in near-expiry options. This is where the name “GammaBot” originates — it thrives in regimes where gamma exposure can be turned into sharp intraday or intraweek profits.

This strategy is not neutral — it is explicitly directional and bullish. Unlike a straddle bot, which profits from movement in either direction, GammaBot bets that the momentum move will continue.

The risk profile includes:

- Total premium paid (maximum loss)
- Limited time to expiry (usually just a few days)
- Reliance on momentum sustainability
- Beta-driven overreaction risk

To mitigate these risks, GammaBot does not trade illiquid names, and all candidates are drawn from a stable list of megacap and large-cap stocks with active option chains.

Additionally, the strategy filters for only the top subset of signals daily — focusing on quality over quantity. Because the underlying stock already shows momentum and strong beta, the strategy assumes an edge over random option purchases.

Unlike traditional delta hedging, GammaBot does not hedge; instead, it leverages the full nonlinear payoff of options. This makes it particularly suited for short-term speculators looking for binary intraday or intraweek outcomes with predefined loss and open-ended reward.

2 Internal Architecture and Workflow of GammaBot

2.1 Core Data Pipeline and Selection Logic

The bot is written in Python and utilizes the Saxo Bank OpenAPI for market data and trade execution. It is built around a predefined universe of 20+ U.S.-listed high-beta tech stocks (TSLA, NVDA, AMD, AAPL, etc.). The workflow begins by retrieving instrument metadata and price series for each ticker.

For every ticker in the list:

1. Retrieve UIC using Saxo's lookup API
2. Fetch latest spot price from Saxo's info price endpoint
3. Fetch closing prices from the last two trading sessions
4. Calculate short-term price change (momentum)
5. Compute beta versus SPY using 60-day return covariance
6. Filter for: beta ¿ 1.5 and daily change ¿ 1%

If a ticker passes both filters, the bot identifies a weekly ATM call using strike proximity to spot price and expiry on the upcoming Friday. These candidate options are aggregated into a Streamlit dataframe for real-time inspection.

All data retrieval includes basic error handling and fallbacks to ensure incomplete API responses do not crash the pipeline. The design is stateless and optimized for responsiveness.

2.2 Execution Model and Streamlit Frontend

The frontend interface provides traders with a snapshot of all filtered opportunities. Each row includes ticker, beta, momentum

- Review which tickers passed the filters
- Select one ticker from a dropdown menu
- Click a button to place a buy order for the associated call option

All orders are sent as market orders via Saxo's trading endpoint, with quantity fixed at one contract. The bot assumes that execution will be nearly immediate and that slippage will be minimal due to high liquidity.

The user receives immediate feedback within Streamlit confirming success or failure. The interface also provides a timestamp of the last refresh, ensuring transparency over data freshness.

The current implementation avoids over-automation to allow for trader discretion and manual risk management. However, it can easily be extended into:

- Fully automated daily execution
- Integration with Slack/Telegram
- Addition of trailing stops or exit targets
- Risk allocation by option delta or premium exposure

In its current form, GammaBot acts as a semi-automated signal generator and executor for short-term directional trades under tightly defined quantitative criteria.