Meet Flex, RegentQuant's options backtesting system

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Introduction

We reject reports overloaded with complicated formulas. True professionalism lies in the work done behind the scenes, while what is presented should be clear and simple. This article contains no complex derivations, but its depth and rigor remain unchanged.

Options trading has become increasingly popular in recent years. More and more retail investors are using options to try to improve their returns or manage risk. While options can offer strong rewards, they also come with high risk. They are more complex than regular stock trading, and without proper understanding, it's easy to make costly mistakes.

To help investors make better decisions, the team at RegentQuant has developed a system called Flex. Flex is designed to backtest any kind of options strategy. This means it allows users to see how a strategy would have performed in the past, before risking real money.

In this article, we introduce the first major feature of Flex: backtesting all the most common options strategies on a stock's earnings day. Earnings days are important events that often cause large price moves. Many traders try to take advantage of this using options, but it can be hard to know which strategy to choose. Flex helps answer that question with real data.

Flex currently supports backtesting for many of the most well-known options strategies. Each one has a different goal—some are used to bet on direction, some to reduce risk, and others to take advantage of price stability or expected volatility. Below is a quick overview of the strategies included in the first version of Flex:

Long Call

This strategy is used when a trader thinks the stock price will go up. They buy a call option, which gives them the right to buy the stock at a certain price before expiration. The potential profit is unlimited, while the loss is limited to the cost of the option.

Long Put

This is the opposite of a long call. A trader uses a long put when they believe the stock price will fall. It gives them the right to sell the stock at a set price. The more the stock drops, the more the put becomes valuable.

Short Call

A short call is when a trader sells a call option. This is used when they expect the stock price to stay the same or fall. If the stock rises too much, the seller faces unlimited risk.

Short Put

This is selling a put option, usually when a trader believes the stock won't fall below a certain level. It can be profitable in stable or rising markets, but losses can be large if the stock drops.

Covered Call

This is when someone owns a stock and sells a call option against it. It can bring in extra income if the stock stays flat or rises slightly, but limits the upside if the stock goes up a lot.

Protective Put

A trader buys a put option while owning the stock. It's like insurance. If the stock price drops, the put helps offset the loss.

Collar

This combines a covered call and a protective put. It limits both the upside and downside. Traders use it to protect gains or limit risk without spending too much.

Bull Call Spread

This is used when a trader expects the stock to rise, but not too much. It involves buying one call and selling another at a higher strike. The risk and reward are both limited.

Bear Call Spread

This is the opposite. It's used when a trader thinks the stock will fall or stay flat. It involves selling a call and buying another at a higher strike to reduce risk.

Bull Put Spread

This strategy profits when the stock goes up or stays above a certain level. It involves selling a put and buying a lower-strike put to protect against big losses.

Bear Put Spread

Used when a trader expects the stock to drop. They buy a put and sell another one at a lower strike. Like other spreads, it limits both risk and reward.

Long Straddle

This involves buying both a call and a put at the same strike and expiration. Traders use it when they expect a big move but aren't sure which direction.

Short Straddle

This is the opposite—selling both a call and a put. It profits if the stock doesn't move much, but losses can be large if it moves too far in either direction.

Long Strangle

Similar to a long straddle, but the call and put have different strikes. It's usually cheaper but still benefits from big moves in the stock.

Short Strangle

This strategy profits from little to no movement. It involves selling a call and a put with different strikes. Like the short straddle, the risk is high if the stock moves a lot.

Iron Condor

A popular strategy that combines two spreads: a bear call spread and a bull put spread. It works best when the stock stays within a certain range. Risk and reward are both limited.

Iron Butterfly

This is a more focused version of the iron condor. It uses a short straddle and two long wings. It has a higher potential reward but also requires the stock to stay closer to the strike.

Each of these strategies can behave very differently, especially around earnings announcements when prices can move quickly and unpredictably. With Flex, traders can test them all and see which ones have worked best in the past—before putting real money on the line.

Methodology

Determining Strikes

To backtest each strategy, Flex needs to decide which specific option contracts to use—such as strike prices and whether to use calls or puts. To do this in a consistent way, it uses a method based on the stock's expected move.

What is Expected Move?

The expected move (EM) is an estimate of how much the stock price might change, either up or down, over a given period—usually until the option's expiration date. This estimate is commonly derived from implied volatility. Flex uses this expected move percentage to scale the strike prices of each options strategy in a consistent and repeatable way.

For instance, if a stock is trading at $100 and the expected move is 5%, then 1.0 times the expected move equals a $5 move in either direction. This would place the projected upper strike at $105 and the lower strike at $95. If the multiplier is 1.5, the upper and lower strikes would become $107.50 and $92.50, respectively. By applying these proportional shifts, Flex determines how far from the current stock price each leg of a strategy should be placed.

How Strikes Are Chosen

Each strategy in Flex is assigned a specific rule for setting strike prices, based on a multiplier of the expected move. The base strike for most strategies is simply the current stock price. From there, Flex shifts each leg either up or down by multiplying the expected move by a factor—such as ±1.0 or ±1.5—depending on the strategy's design. These shifted values are then rounded to realistic strike levels, often to the nearest dollar, to match actual options market conditions. The rounded strike prices are used to construct the long and short legs of the strategy.

By using this method, Flex builds each strategy in a consistent and logical way, ensuring that backtesting results are fair, comparable, and reflective of real-world trading choices.

Strategy	Legs Based on Expected Move
Long Call	Buy Call at ATM (0.0x EM), Sell Call at +1.0x EM
Long Put	Buy Put at ATM (0.0x EM), Sell Put at −1.0x EM

Short Call	Sell Call at ATM, Buy Call at +1.2x EM
Short Put	Sell Put at ATM, Buy Put at −1.2x EM
Covered Call	Own stock, Sell Call at +1.0x EM
Protective Put	Own stock, Buy Put at −0.7x EM
Collar	Buy Put at −0.7x EM, Sell Call at +1.0x EM
Bull Call Spread	Buy Call at ATM, Sell Call at +1.0x EM
Bear Call Spread	Sell Call at ATM, Buy Call at +1.5x EM
Bull Put Spread	Sell Put at ATM, Buy Put at −1.5x EM
Bear Put Spread	Buy Put at ATM, Sell Put at −1.0x EM
Long Straddle	Buy Call + Buy Put at ATM (same strike)
Short Straddle	Sell Call + Sell Put at ATM
Long Strangle	Buy Call at +1.0x EM, Buy Put at −1.0x EM
Short Strangle	Sell Call at +1.2x EM, Sell Put at −1.2x EM
Iron Condor	Sell Put at −0.8x, Buy Put at −1.5x, Sell Call at +0.8x, Buy Call at +1.5x
Iron Butterfly	Sell Call + Put at ATM, Buy wings at ±1.0x EM

Determining Expirations

To fully understand how different options strategies perform around earnings, Flex tests each strategy using two different expiration dates. This approach helps capture both the short-term effects of earnings announcements and the slower changes that may occur in the days that follow. It also reflects how many traders think about time and volatility when choosing options contracts.

The first expiration date we use is the front-week expiration, which refers to the options that expire in the same week as the earnings report. For example, if Tesla reports earnings on a Tuesday, the front-week expiration would typically be that Friday. These options are highly sensitive to the earnings announcement because they are close to expiration and carry a high level of implied volatility. After earnings are released, implied volatility usually drops sharply—this is known as "IV crush." Since short-dated options are most affected by this drop, they provide a clear picture of how quickly volatility can impact profits and losses. In our backtest, we enter the strategy at the close of the trading day before earnings and close it at the end of earnings day. This lets us isolate the immediate market reaction, both in terms of price movement and volatility shift.

The second expiration date we use is approximately 30 days after entry. These longer-dated options are less sensitive to daily market noise and experience a slower decline in implied volatility. While they are not as reactive to earnings as front-week options, they still show meaningful changes in value due to shifts in market expectations. By including a 30-day expiration, we can observe how each strategy performs not just on earnings day, but also in the days after. In these cases, we still enter the position one day before earnings, but instead of closing it immediately, we record the results at the end of earnings day and again five trading days later. This allows us to see how strategies behave as the market digests the earnings results and as volatility continues to settle.

Using two expirations helps us understand the full effect of earnings on an options strategy. Some strategies may appear profitable right after earnings but lose value quickly afterward. Others may take time to work, especially if the market reaction is more gradual. By comparing short- and medium-term performance, Flex gives traders a clearer view of how expiration choice affects outcomes. This dual-expiration method reflects a practical and professional way to approach earnings trading, where understanding both timing and volatility is key to making better decisions.

NVDA Example: Input Parameters

This example is based on NVIDIA's earnings release after market close on May 28, 2025. The table includes all key data required for running backtests and performing further analysis. In this context, "vd" refers to the trading day directly affected by the earnings report, typically the day the market reacts to the announcement. "iv" stands for implied volatility, which reflects the market's expectation of future price movement.

ticker	NVDA
vd_minus_1_date	2025-05-28
vd_date	2025-05-29
vd_plus_4_date	2025-06-04
front_week_exp_date	2025-05-30
thirty_dte_exp_date	2025-06-27
close_vd_minus_1	134.81
close_vd	139.19
close_vd_plus_4	141.92
iv_vd_minus_5	56.23%
iv_vd_minus_4	55.62%
iv_vd_minus_3	56.38%
iv_vd_minus_2	53.69%
iv_vd_minus_1	51.22%
iv_vd	43.20%
iv_vd_plus_1	44.24%
iv_vd_plus_2	40.33%
iv_vd_plus_3	39.41%
iv_vd_plus_4	39.05%

expected_move_pct	6.42%
actual_move_pct	3.25%
iv_crush_1d_pct	8.02%
iv_crush_5d_pct	12.17%

NVDA Example: Choosing Strikes

Strategy	Legs (Type, Strike)	Description
Long Call	Call 135, Call 143	Buy at ATM, sell higher strike; bullish directional play
Long Put	Put 135, Put 126	Buy at ATM, sell lower strike; bearish directional play
Short Call	Call 135, Call 145	Sell at ATM, hedge at higher strike; bearish credit spread
Short Put	Put 135, Put 124	Sell at ATM, hedge at lower strike; bullish credit spread
Covered Call	Stock + Sell Call 143	Generate premium while holding stock; caps upside
Covered Put	Short stock + Sell Put 126	Bearish version of covered call; collects downside premium
Protective Put	Stock + Buy Put 129	Protects downside below 129 while holding stock
Collar	Buy Put 129, Sell Call 143	Limits both downside and upside; low-cost hedge
Bull Call Spread	Buy Call 135, Sell Call 143	Gains if price rises moderately; defined risk/reward
Bear Call Spread	Sell Call 135, Buy Call 148	Gains if price stays below 135; limited loss at 148
Bull Put Spread	Sell Put 135, Buy Put 122	Gains if price stays above 135; limited loss below 122
Bear Put Spread	Buy Put 135, Sell Put 126	Gains from moderate price drop; defined risk
Long Straddle	Buy Call 135, Buy Put 135	Expects large move in either direction; both legs ATM
Short Straddle	Sell Call 135, Sell Put 135	Expects minimal movement; max profit if price stays flat
Long Strangle	Buy Call 143, Buy Put 126	Lower cost alternative to straddle; OTM legs

Short Strangle	Sell Call 145, Sell Put 124	Profits if price remains between strikes; high risk if not
Iron Condor	Sell Put 128, Buy Put 122; Sell Call 142, Buy Call 148	Range-bound strategy; wide neutral zone between 128–142
Iron Butterfly	Sell Put 135, Sell Call 135; Buy Put 126, Buy Call 143	Tight range-neutral strategy centered at 135

NVDA Example: Output Results

	FRONT WEEK		THIRTY DTE			
	p_atm_at_vd	**p_otm_at_vd**	**p_atm_at_vd**	**p_atm_at_t_plus_4**	**p_otm_at_vd**	**p_otm_at_t_plus_4**
Long Call	-0.66%	-82.46%	13.55%	23.35%	5.68%	2.27%
Long Put	-93.74%	-96.30%	-43.01%	-68.63%	-47.06%	-77.03%
Short Call	-0.66%	-82.46%	13.55%	23.35%	5.68%	2.27%
Short Put	-93.74%	-96.30%	-43.01%	-68.63%	-47.06%	-77.03%
Covered Call	3.39%	4.35%	2.62%	4.17%	3.17%	5.38%
Protective Put	0.03%	1.69%	0.87%	1.48%	1.57%	2.68%

	FRONT WEEK	THIRTY DTE	
	p_at_vd	**p_at_vd**	**p_at_t_plus_4**
Collar	2.75%	1.44%	2.69%
Bull Call Spread	48.59%	23.88%	51.04%
Bear Call Spread	-48.59%	-23.88%	-51.04%
Bull Put Spread	93.40%	37.58%	63.67%
Bear Put Spread	-93.40%	-37.58%	-63.67%
Long Straddle	-47.60%	-13.89%	-21.26%
Short Straddle	47.60%	13.89%	21.26%
Long Strangle	-88.56%	-17.94%	-33.25%
Short Strangle	88.56%	17.94%	33.25%
Iron Condor	80.35%	10.67%	14.33%
Iron Butterfly	27.12%	9.32%	7.77%

The first table includes all strategies that involve only a single option leg. These are the most basic forms of options trades, such as buying or selling a call or a put. Because they consist of just one leg, they allow for a simple classification between at-the-money (ATM) and out-of-the-money (OTM) positioning. This flexibility enables us to test the same strategy under different risk and reward profiles, depending on how far the strike is from the current stock price.

In contrast, the second table presents all strategies that include multiple legs. These strategies involve a combination of two or more option contracts, often constructed to limit both potential profit and potential loss. Due to their structure, the concept of ATM versus OTM does not apply in the same way as it does for single-leg trades. Instead, the relative positioning of the legs is already built into the strategy design.

What to Expecet Next?

We will be conducting batch backtests across all earnings days for popular stocks with strong options trading volume. All findings that are reviewed and approved by the trading department will be incorporated into live trading to support and enhance fund–level strategy decisions.

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