

Macro Hive Prime: Zero Days to Castration Options – Bad Things Will Happen, Eventually

(Thorsten Wegener, info@macrohive.com, 23 May 2023)

Now that I have your attention, let us use the proper term again for this increasingly popular trading instrument: Zero Days to Expiration Options, or short Zero DTE Options.

According to CBOE data, these fascinating little gems of speculation are now contributing to just under 50% of options traded in the official markets. They do exactly what they say on the tin: if you court them in the morning, they will be gone by night, therefore enabling the willing risk taker or giver to trade on ever smaller timeframes.

So, shall we condemn those instruments as an irresponsible tool of reckless speculation by mom and pop retail traders, hoping to hit the jackpot?

A [comprehensive study](#) by JP Morgan begs to differ.¹ Only some 5% to 6% of Zero DTE Options are being traded by 'get rich quick or blow up your savings' retail customers. The lion's share in trading volume is attributed to institutional traders like hedge funds, market makers, and my latest pet hate, algorithms. To explain this popularity, we must look under the hood of these, for now, shortest tradable, let me call them, risk assets.

The Mechanics of Zero DTE Options

Options are contracts to speculate and mitigate risks, and they have a lot of moving parts. Depending on whether you buy or sell them, they are either a right or an obligation.

Contrary to real assets, in this case stocks or baskets of stocks (indices), options have a finite lifespan. And as investors do not have to cough up the full price of an asset when optionality is involved, they are a magnificent tool for speculation. Of course, this makes things a bit more complicated than just being long or short the underlying. I will focus on three of these moving parts: Delta, Gamma and Vega.

The Delta of an option simply explains to the investor in which market direction profits or losses are generated, comparable to the speed with which you would drive a car. If you are driving fast, you have a high delta. If you are cruising with your family to a BBQ, you have a low Delta.

When you suddenly push the accelerator, your speed increases and you arrive faster at your destination. This is what option traders call Gamma.

The last factor we want to introduce to distinguish different option maturities for the purpose of explaining Zero DTE Options is Vega. Vega is the sensitivity of your driving style in relation to how clearly you can see the road ahead. The farther you can see down the

¹ <https://www.bloomberg.com/news/articles/2022-11-04/pro-traders-and-algos-have-overrun-the-fast-twitch-option-market>

road ahead for the rest of your journey, the faster you can drive. More uncertainty would require you to slow down. There is a trade-off between speed and uncertainty.

Applying Our Crude Analogy to Option Markets

When traders and investors talk about options, they generally envisage something which, apart from the speed at which you want to drive (Delta), has an accelerator, Gamma – also known as convexity – and a sensitivity to the uncertainty of the stretch of road ahead farther than the next few metres (Vega).

However, if you only have a short drive ahead of you to reach your destination you, might as well floor it! Who cares what might be blocking the road 10 miles ahead if you only have a mile to go?

Your significant other, riding shotgun, will not be appreciated for his or her ability to divine the driving conditions far ahead. So extremely short-dated options are all about speed and acceleration.

The increasing number of market participants at the extreme short-dated end of option markets are almost exclusively entertaining gamma risk, leveraging positions up their wazoo. If the proverbial tail event happens intraday, there is no mitigating factor to 'adverse' portfolio evaluations.

Tom Sosnoff (of Tastytrade fame) tasked his quants to analyse the risk of Zero DTE options compared to the 30 to 45 days to expiration timeframe. This used to be the playground for option sellers, who benefit from time decay and contraction in volatility, thereby providing Vega risk for investors.

The tail risk in Zero DTE Options is, assuming a one standard deviation intraday move, 22 times greater than for Options with a maturity longer than 30 days. If the market moves over two standard deviations (to be expected 5% of the time, statistically), the tail risk is 42 times greater. The 1% three standard deviation move then produces a slightly decreasing risk factor of 'only' 36 times.²

So Why Are These Zero DTE Options So Popular?

Mainly two reasons:

1. If you ride your dark horse intraday through markets you will have to cough up no (or very little) equity to fund your positions, which of course equals higher returns.
2. Time decay is the other upside for well diversified market makers or the Skynet Algos who mainly sell premium. Selling Zero DTE Options 252 times a year generates more premium income than selling 12 times 30 days to expiration Options. This also works nicely for the flipside. Hedging a position against a specific short-term event by buying options is reducing the capital outlay.

² Geek Stuff: Due to the short expiration cycle, there is no gamma left anymore at this point. You are basically short or long a highly leveraged delta one position.

And, of course, the retail crowd plays both ways to make some extra ‘Lambo money’. But as we know, they are a surprisingly small part of the market with only about 5% to 6% market share.

Why Can’t We Have Nice Things, Then?

My feelings of inevitable doom are based on the changing structure of the market. The liquidity providers for longer-dated options are progressively taking their little hot dog cart further down the expiration cycles for the above reasons, reducing the supply of uncertainty protection (Vega), and increasing the supply of leverage (Gamma or Convexity).

With the increasing popularity of short-dated options, the supply side on the longer end will deteriorate. Everybody wants to be where the big bucks are being made faster and, if an accident (the classic tail event) happens, the overwhelming demand for longer-dated protection will not be sufficiently served.

I might have mentioned this story before, but it is too good an example to not be retold and make my point. I was a humble market maker in 1998, when LTCM blew up. Volatility went through the roof, and soon the phones started ringing. The head of trading from one rather large bank with huge market exposure (which shall not be named) was very brief on the other side of the line when he called me: ‘Thorsten I need Vega’. I enquired how much. ‘Whatever you have’. Which maturities? ‘Whatever you have’. Which underlying? ‘All of them’.

Even though the prices my poor colleague paid in my little corner shop could by no means be considered modest, the marketplace worked well. A spike in volatility and an increased demand for Vega was satisfied at admittedly elevated levels because the infrastructure to facilitate for those events existed.

And as we all know, reoccurring tail events of the past always deliver the data points for stress scenarios. Typically, a general always prepares for the next war based on the experience of the last war. I think the battlefield, the weapons and the attitude toward risk have temporarily changed, and this could end in an unpleasant surprise.

FED Speak: ‘Severely Adverse Scenario’

In February 2023, the Fed published [various stress-test scenarios](#) for the banking sector.³

‘Asset prices drop sharply in the severely adverse scenario. Equity prices fall 45 percent from the fourth quarter of 2022 through the fourth quarter of 2023, and do not return to their initial level until the end of the scenario. The maximum quarterly value of the VIX reaches a peak value of 75 in the second quarter of 2023, then declines to about 32.5 at the end of the scenario. House prices and commercial real estate prices also experience large declines. House prices fall sharply through the third quarter of 2024, reaching a trough that is about 38 percent below their level in the fourth quarter of 2022.’

³ <https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20230209a1.pdf>

I might or might not agree with the economic predictions, and I might or might not agree with their stock market forecast. But the figure that for me stood out like a sore thumb in a severe risk scenario was the predicted VIX Level of 75. Basing the stress test results of the 'severely adverse scenario' on 2009 or 2020 events might just fall short of reality. If you go a bit further back in history, you might get a comparable (and in my view more likely) scenario.

In the 1987 crash, a reconstructed VIX (it did not exist at the time) spiked at just over 170 points, way beyond the stress test scenarios and worst-case assumptions the Fed is feeding into its models today.

I believe this was also a classic supply and demand situation. At the time, a new product called 'portfolio insurance' was highly popular among long-only investors, cannibalizing the classic protection provided through options.

In short, this product tricked investors who wanted to hedge their positions. It let them believe that by just continuously adjusting the portfolio against adverse market moves by buying and selling chunks of it, you could mimic option protection without the uncertainty (Vega) or convexity (Gamma) bit. And in doing so, you could save premium.

When it was needed, desperately needed, there were not sufficient sellers left, and the market rampaged through levels [considered impossible](#)⁴.

If I am correct, and the supply side for longer-dated options, 30 days measured through the VIX, is dwindling because the suppliers have shifted their interest to the extreme short end, the following scenario might materialize.

An unexpected shock wipes out the Zero DTE Market in one swift swoop. Negative Gamma's will wreak havoc and amplify the downturn. Risk factors of over 40 times larger than with more traditional option maturities will leave no room for some kind of valiant rear-guard action.

At the same time, investors will wait for the boats on the beaches of Dunkirk, only to realize they will not show up. Why? Because the spitfires providing air cover, the traditional option sellers supplying the desperately needed Vega, have been grounded long before.

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⁴ <https://macrohive.com/deep-dives/peak-volatility-how-hot-can-it-get/>