

Gamma transforms: How to hedge squeeth using Uni V3

[Guillaume Lambert](#)

[Follow](#)

--

1

Listen

Share

- Gamma is a measure of the convexity of an asset's payoff curve
- squeeth is a blockchain-native asset with a payoff where $\gamma = +2$ at all prices
- Single-tick Uniswap v3 LP positions can be used to hedge the gamma of payoff curves with positive convexity like squeeth
- We demonstrate how to hedge any positive gamma instrument using a "Gamma transform"

You may have read one of the many articles describing how squeeth can be used to [hedge options](#) or a [Uniswap v3 LP position](#). In this article, I describe how to do the opposite: how to use Uniswap v3 to perfectly hedge a squeeth, options, or any positive convexity instrument over an arbitrary range.

What is Gamma?

Gamma is a measure of the "convexity" of the value of an asset. An asset with a positive convexity will increase in value faster as its price increases, while an asset with negative convexity will see diminishing returns as its price increases. Here's a graph showing how gamma affect asset pricing:

It also helps to understand Gamma from its formal definition as the second derivative of the value of an asset. Specifically, if the value $V(S)$ of a financial instrument depends on the price S of an asset, then the Delta (Δ) and Gamma (Γ) of $V(S)$ are defined as:

So if Delta is the change in value as a function of price, then Gamma is defined as the change in Delta as a function of the price. So Delta is the slope

of the payoff curve, and Gamma is the slope of the slope

of the payoff curve.

We can visualize below the delta and gamma of a Call option (an asset with positive convexity) by looking at the slope and curvature of each function:

Gamma for defi primitives

The delta, gamma, and all the other "greeks" for options are all known and can be [derived from the solution to the Black-Scholes model](#).

What are the greeks for defi-native financial instruments?

Squeeth:

First, let's look at squeeth, a recently released financial product by the [Opyn](#) team. Squeeth is a [type](#) of [power perpetual](#) whose return is equal to the square of the price of ETH (squeeth = square-eth). This means that the value of a squeeth is S^2 if the price of ETH is S .

Thus, the Delta of squeeth is $2 \cdot S$ and the Gamma is a constant 2. The squeeth payoff will look like a quadratic function with a linear Delta and a flat Gamma.