**Revolutionizing Decentralized Tokenized Derivatives Trading with DeriveX**

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 **ABSTRACT**

DeriveX is an upcoming synthetic tokenized derivatives platform that provides perpetual futures (future contracts that never expire) for 5000+ markets (Crypto,Forex,Commodities,Global Equities) in a completely decentralized manner on top of the Celo Blockchain and Optimism developed by Xade Labs for the World’s First De-fi Neobank: Xade. We aim at creating the world's best, most accessible and most secure decentralized derivatives trading platform and solve the issues in the current traditional derivatives market by providing a hybrid solution between Exchange Traded Derivatives(ETD) and Over The Counter Derivatives(OTC) through Defi. All trades in Derivex are settled in Celo USD (cUSD) on Celo and USDC on Optimism but we will be adding support for more stable coins and cryptos in the future. Derivex acts as a decentralized clearing house and uses xAMM(virtual Automated Market Makers) to provide low slippage and good liquidity with instant settlement and close to zero fees.

**Keywords:** Analysis, investigation, research.

1. **TRADITIONAL DERIVATIVES MARKET**

Derivatives is a product whose value is derived from the value of one or more basic variables, called bases (underlying asset, index, or reference rate), in a contractual manner. The underlying asset can be equity, forex, commodity or any other asset. For example, wheat farmers may wish to sell their harvest at a future date to eliminate the risk of a change in prices by that date. Such a transaction is an example of a derivative. The price of this derivative is driven by the spot price of wheat which is the “underlying”.

**Advantages and Uses of Derivatives:**

* Improved market Accessibility
* Hedging against spot Market Positions
* Speculation on both directions of the market
* Leveraged Trading

The most commonly traded form of Derivatives are Futures. A futures contract is an agreement to buy or sell a commodity, currency, or another instrument at a predetermined price at a specified time in the future.

Unlike a traditional spot market, in a futures market, the trades are not ‘settled’ instantly. Instead, two counterparties will trade a contract that defines the settlement at a future date. Also, a futures market doesn’t allow users to directly purchase or sell the commodity or digital asset. Instead, they are trading a contract representation of those, and the actual trading of assets (or cash) will happen in the future - when the contract is exercised.

As a simple example, consider the case of a futures contract of a physical commodity, like wheat, or gold. In some traditional futures markets, these contracts are marked for delivery, meaning that there is a physical delivery of the commodity. As a consequence, gold or wheat has to be stored and transported, which creates additional costs (known as carrying costs). However, many futures markets now have a cash settlement, meaning that only the equivalent cash value is settled (there is no physical exchange of goods). Additionally, the price for gold or wheat in a futures market may be different depending on how far is the contract settlement date.

The longer the time gap, the higher the carrying costs, the larger the potential future price uncertainty, and the larger the potential price gap between the spot and futures market.

**There are 2 main types of Derivatives:**

* Exchange traded derivatives (ETD): are traded through central exchange with publicly visible prices.
* Over the Counter (OTC): are traded between two parties (bilateral negotiation) without going through an exchange or any other intermediaries. OTC is the term used to refer to 3 stocks that trade via dealer network and not any centralized exchange. These are also known as unlisted stocks where the securities are traded by broker-dealers through direct negotiations.

**Disadvantages of ETDs:**

* Not accessible to everyone
* Traded only during specified market hours
* Controlled by a Central Entity

**Disadvantages of OTCs:**

* Counterparty Risk
* Lack of Clearing House
* Poor Liquidity
1. **WHAT IS DERIVEX**

DeriveX is a hybrid solution that is built on top of the Celo Blockchain and provides non-expiring futures for 5000+ markets including but not limited to stocks, forex and crypto in a completely decentralized manner. It solves the problems of both the ETD and OTC derivatives market by providing a decentralized clearinghouse and xAMMs that solve the issues of accessibility, counterparty trust and liquidity.

**Advantages of DeriveX:**

* Access to 5000+ markets on chain at one place
* 24/7 market access
* upto 10x leverage on trading
* Speculate on both sides of the market by either going long or short
* Low fees and Instant Settlements due to the Celo Blockchain.
* 100% non-custodial and decentralized trading on chain.
1. **KEY CONCEPTS**
2. **ASSET TOKENIZATION**

An asset can be tokenized by creating a digital token on a blockchain (eg: Celo,Ethereum,Solana etc.) that represents that asset. This asset can be anything from Commodities to Stocks to Real Estate or even other Cryptos.

There are two types of Tokenized Assets:

1. Asset-backed tokens: are tokens which are backed one-to-one by the physical or abstract goods that they represent. For instance, an asset-backed gold token representing 1 ounce of gold would need to be backed by 1 ounce of physical gold stored in a vault.

2. Synthetic tokens: are tokens that provide “synthetic” exposure to the physical or abstract goods that they represent without requiring one-to-one backing. For instance, a synthetic gold token representing 1 ounce of gold would be exchangeable for the price of 1 ounce of physical gold. Synthetic tokens can be issued either by a centralized party, e.g. a bank whose credit “backs” the token, or a decentralized network whose incentives guarantee that the synthetic token is always exchangeable for the price of the asset it represents.

DeriveX uses synthetic tokens.

1. **PERPETUAL FEATURES**

A perpetual contract is a special type of futures contract, but unlike the traditional form of futures, it doesn’t have an expiry date. So one can hold a position for as long as they like. Other than that, the trading of perpetual contracts is based on an underlying Index Price. The Index Price consists of the average price of an asset, according to major spot markets and their relative trading volume. The Index Price is provided by a decentralized oracle(i.e A decentralized oracle or is a group of independent blockchain oracles that provide data to a blockchain. Every independent node in the decentralized oracle network independently retrieves data from an offchain source and brings it on-chain.)

Perpetual contracts allow traders to speculate on the future price of a given asset by buying (going long) or selling (going short) perpetual futures contracts. There are two mechanisms that moderate this process, and function to keep the perpetual contract price close to the spot price:

1. Funding payments. Every hour, traders with open long or short positions will pay each other a funding payment, depending on market conditions. If the contract price is above the spot price, longs will pay shorts. If the contract price is below the spot price, shorts will pay longs. The size of the funding payment is a function of the difference between the contract price and the spot price, as well as your position size. This incentivizes traders to take the unpopular side of the market.

2. Arbitrage. If the contract price diverges significantly from the spot price in other exchanges, arbitrageurs can benefit in two ways. 1. If they hold a position elsewhere, they can use Derivex to take the inverse position and earn funding payments. 2. They buy or sell an asset elsewhere, and long or short that asset using Derivex, in the expectation that the price will tend to move back toward the spot price.

1. **HOW WE FUNCTION**
2. **OVERVIEW OF A TRADE**

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1. Before a xAMM is created on the blockchain, the creator of a xAMM sets the number of virtual assets stored inside the xAMM. Suppose the price of ETH is trading at 400 USDC. The creator can set an initial amount of vETH and vUSDC on xAMM with a ratio of 1-to-400. For simplicity, imagine the creator sets the initial state on that xAMM as 100 vETH and 40,000 vUSDC.

2. Trader A wants to open a 10x long position with 100 USDC collateral.

3. On opening a position, the user will be charged fees by the Xade and Trader A will enter into a smart contract with 1000vUSDC and it will get recorded by the clearinghouse.

4. Trader B and C wants to open a 10x short position with 50 USDC each and will enter in the same smart contract as trader A.

5. The xAMM will fill the order.

6. Either of these traders may sell their positions to someone else at any time

1. **XAMM**

To enable on-chain perpetual contract trading, Derivex introduces a novel approach called a Virtual Automated Market Maker(xAMM). Derivex’s xAMM uses the same x\*y=k constant product formula as Uniswap. AMM is the underlying protocol used by decentralized exchanges with an autonomous trading mechanism. This eliminates the need for centralized authorities like exchanges and other financial entities. Put simply, it allows two users to transact their assets without any intermediary facilitating the exchange.

As the "virtual" part of xAMM implies, there is no real asset pool (k) stored inside the xAMM itself. Instead, the real assets are stored in a smart contract vault that manages all of the collateral backing the xAMM. Derivex uses a xAMM as a price discovery mechanism instead of a direct liquidity pool for spot trading like Uniswap, Balancer, or Curve. Our exchange model is very different from other exchanges, including AMM based exchanges.

Key points to begin with:

- Access to 5000+ markets on chain at one place

* 24/7 market access
* upto 10x leverage on trading
* Speculate on both sides of the market by either going long or short
* Low fees and Instant Settlements due to the Celo Blockchain.
* 100% non-custodial and decentralized trading on chain.
1. **LEVERAGE AND LIQUIDATION**

Derivex allows traders to use leverage by backing a position with a margin—collateral that is worth less than the total position size. Traders can open positions with leverage up to 10x. Note that an effective leverage of 16x, equivalent to a margin ratio of 6.25%, is the point at which your position can be liquidated. Liquidation is a key part of leveraged trading. When you open a leveraged position, in a sense you are using collateral to borrow money from the exchange to purchase an asset.

For example, you can open an ETH long position worth 1000 USDC backed by a margin of 100 USDC. Your margin ratio is 10%, equivalent to a leverage of 10x. If ETH falls in value, you start to lose money, resulting in a negative PnL. PnL is added to your margin, so in our example, your margin will start to go below 100 USDC, in turn decreasing your margin ratio. If the margin ratio falls to 6.25%, then your position may be liquidated.

1. **LIQUIDATION**

If the value of that asset (aka your position) falls, your losses begin to approach the value of your margin (ie. your initial collateral). This puts the exchange at risk—a sudden price movement could make your position worth less than your collateral. If the value of your asset is dangerously close to the value of your collateral, the exchange will proactively liquidate your position in order to secure against losses.

For example, if you open a 10x leveraged position using 100 USDC, your total initial position is worth 1,000 USDC—900 USDC of that position's value is borrowed. Therefore, the exchange enforces a minimum ratio between the position's value and the margin, called a maintenance margin. On Derivex, the maintenance margin is 6.25%.

**Liquidation is triggered by keeper bots.** As a reward for performing this service, keepers earn 1.25% of the remaining position notional. Keepers are used with blockchains because smart contracts and blockchains in general are passive and cannot execute code without external triggers. Keeper bots are a decentralized way to accomplish this trigger (anyone can run the bot).

**Oracle Based Calculation During Severe Market Conditions.** In order to combat flash crash risk, if the mark price diverges more than 10% from the index price (oracle price), liquidations will be evaluated based on oracle price. This measure provides an additional check against the risk of liquidation during a flash crash if the price on Derivex diverges severely from spot prices.

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**Partial liquidation.** To make trading safer and fairer, Derivex uses partial liquidations. As long as your ratio between the asset value and the margin (margin ratio) is above 2.5%, only 25% of your position will be liquidated, leaving the rest of your position intact with a margin ratio above the liquidation point.

**Margin ratio.** Margin ratio is calculated by adding your margin size and PnL for a given position, and then dividing by the position notional (position size multiplied by mark price\*).

**Index price calculation check.** Normally position notional is calculated by multiplying your position size by the asset's mark price. However, when index price diverges from mark price by 10% or more, the position notional is calculated by multiplying position size by the asset's index price. This serves as an additional check before triggering liquidations during severe or anomalous market conditions.

**Profit & Loss.** PnL is calculated using both Mark Price and 15-minute Price Feed of Mark Price; the higher of the two values is used when evaluating liquidations conditions.

1. **FUNDING RATE**

Periodic funding payments are the most common mechanism used by exchanges to do perpetual swaps. Funding payments act to converge the mark price (the price on Derivex) and the index price (the average price from major exchanges). In this system either longs pay shorts or shorts pay longs. Derivex calculates funding payments every 5 seconds for capital efficiency.

**fundingPayment=positionSize∗fundingRate**

We use the price feed from RedStone Oracles as the data source for the index price If the fundingRate is positive, long position holders need to pay the funding payment while short position holders will receive the funding payment, and vice versa if the rate is negative. The funding payment happens at the end of 5s on Derivex.

1. **INSURANCE FUND**

Insurance Funds help a trader secure his perpetual futures account from being liquidated. It is a simple method to safeguard a trader’s account and his collateral. If a “longer” is unable to close a trading position due to market price drop or other reasons, then his account will be liquidated as the balance goes below the minimum required amount. position has to be closed due to a market price drop, it means that his account will be liquidated.The Insurance Fund is a method that uses the collateral deposited by the liquidated traders to overcome losses of bankrupt accounts. Interestingly, this fund keeps increasing when users are liquidated before the trading positions are closed. Since these positions remain open, the Insurance funds are utilized to cover the losses that were incurred due to open positions. 20% of total fee charged by the exchange is charged on opening of a position for Insurance Funds.