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 decentralised manner on top of the Celo Blockchain developed by Xade Labs.

Xade Labs is the R&D arm of XADE.XADE is a defi service provider that uses the best De-fi protocols while providing the user experience of a Neo-bank.Xade will be the exchange provider for Derivex.

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) but we will be adding support for more stablecoins and cryptos in the future. Derivex acts as a decentralised clearing house and uses vAMM(virtual Automated Market Makers) to provide low slippage and good liquidity with instant settlement and close to zero fees due to Celo Blockchain.

THE 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) : derivatives are traded between two parties (bilateral negotiation) without going through an exchange or any other intermediaries. OTC is the term used to refer to

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
- Trade only during specified market hours
- Controlled by a Central Entity

Disadvantages of OTC:-

- CounterParty Risk
- Lack of Clearing House
- Poor Liquidity

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 decentralised manner.
It solves the problems of both the ETD and OTC derivatives market by providing a decentralised clearinghouse and vAMMs 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 decentralised trading on chain.

ABOUT CELO

Celo is an EVM compatible Layer-1 Blockchain with 5 second block finality time and very low gas fees.
Celo's technology innovations allow it to truly work across devices, carriers, and countries. Celo uses a novel Proof-of-Stake (PoS) consensus protocol and a hyper-efficient light client. With its interoperability, cross-chain compatibility, and vision for currency inclusivity, Celo enables digital assets to circulate at extremely low costs and high speeds across devices, carriers, and countries, making money mobile, global and accessible like never before. Celo is supported by a mission-aligned network of technologists and international organizations committed to building an inclusive financial system that creates the conditions for prosperity—for everyone.

DERIVEX IS BUILT ON TOP OF THE CELO BLOCKCHAIN SINCE WE BOTH SHARE THE SAME MISSION AND CELO PROVIDES INSTANT SETTLEMENTS AND LOW FEES.

KEY CONCEPTS

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 ex- changeable 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 to- ken, 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.

PERPETUAL FUTURES

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 off-chain 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:-

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.

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.

HOW WE FUNCTION

OVERVIEW OF A TRADE

1. Before a vAMM is created on the blockchain, the creator of a vAMM sets the number of virtual assets stored inside the vAMM. Suppose the price of ETH is trading at 400 cUSD. The creator can set an initial amount of vETH and vcUSDon vAMM with a ratio of 1-to-400. For simplicity, imagine the creator sets the initial state on that vAMM as 100 vETH and 40,000 vcUSD.
2. Trader A wants to open a 10x long position with 100 cUSD collateral.
3. On opening a position,the user will be charged fees by the exchange provider and Trader A will enter into a smart contract with 1000vcUSD and it will get recorded by the clearinghouse.
4. Trader B and C wants to open a 10x short position with 50 cUSD each and will enter in the same smart contract as trader A.
5. The vAMM will fill the order.
6. Either of these traders may sell their positions to someone else at any time.

vAMM

To enable on-chain perpetual contract trading, Derivex introduces a novel approach called a Virtual Automated Market Maker(vAMM). Derivex's vAMM uses the same x*y=k constant product formula as Uniswap. AMM is the underlying protocol used by decentralised exchanges with an autonomous trading mechanism. This eliminates the need for centralised 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 vAMM implies, there is no real asset pool (k) stored inside the vAMM itself. Instead, the real assets are stored in a smart contract vault that manages all of the collateral backing the vAMM. Derivex uses a vAMM 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:
Derivex does not use liquidity or liquidity providers.
Derivex is 100% AMM based; there is no order book.
The on-chain price reflects trades on Derivex - the price only moves when positions are opened or closed .The vAMM calculates the entry or exit price in the same way prices are calculated on Uniswap or other AMM style exchanges.

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.
EXAMPLE:
You can open an ETH long position worth 1000 cUSD backed by a margin of 100 cUSD. 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 cUSD, in turn decreasing your margin ratio. If the margin ratio falls to 6.25%, then your position may be liquidated.

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 cUSD, your total initial position is worth 1,000 cUSD—900 cUSD 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 more fair, 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.

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 hour.

fundingPayment=positionSize∗fundingRate

The fundingRate in the formula above is calculated by, firstly, subtracting the hourly time-weighted average price of the index price from the hourly price feed of the mark price, and secondly, dividing the result from the previous step by 24.

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 each hour on Derivex.

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.