

WHITEPAPER

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What is Derived Finance?

Derived finance aims to propel the usage of leveraged synthetic assets ^{[1][2]} on Polkadot. Synthetic assets have become very popular in recent times with the introduction of protocols like Synthetix^[3], UMA^[4] and Mirror finance^[5]. In the age of blockchain, transparency, censorship resistance and globally distributed characteristics makes tokenization of assets a lucrative investment opportunity for an average person to invest in stocks, commodities and any other assets in the world.

While the protocols mentioned above have their own architecture and way of handling Synthetic assets, our derived protocol aims to improve upon those above mentioned protocols like providing a gateway to a global decentralized marketplace with no restrictions by any centralized authorities. Added to this, you will also have several features of Defi with a click of button away like staking and earning returns

What are 'Derived' tokens?

Derived (or synthetic) tokens, in simple terms means, tokens that are representative of real tokens/stocks/assets. It allows users to own the underlying assets without necessarily having to hold them. Any asset that has a reliable and easily trackable price can be traded using derived tokens.

In cryptocurrency markets, this allows the user to gain exposure to the assets, giving investors the leverage to trade digital and traditional assets, while staying in the crypto ecosystem. There can also be basket of synthetic assets (example; Synthetic SPY, Synthetic Nifty, derived token to USD or dBTC as a derived token for BTC or dapple as derived token for apple shares, so on and so forth). The applications of derived tokens are limitless.

Advantage of Derived Protocol

1. Trade any asset, any pair: BTC to Apple or ETH to Tesla; there is no limitation and you can trade directly between different categories of assets. Want to play with stocks on weekdays and crypto with weekends? One can easily swap between the assets within the platform.
2. Leveraged staking/minting: Other platforms out there either use very high C Ratio (500%) or very low C ratio (150%). Our platform allows them the flexibility to choose the leverage (1x-3x) on the basis of their risk-taking capabilities. The leveraged minting function allows the user to unlock more of their staked capital on the platform.
3. Hybrid tokens: The hybrid token is the unique system that will only be available on the Derived platform. Hybrid tokens are a combination of two or more tokens/stocks/ commodities/forex. New to market? Buy BTC and ETH together. Bullish on DeFi exchanges? Now you can buy UNI, Sushi, 1inch, a single token, or buy the portfolio of your favorite VC firm as a single token. You can even be able to buy Bitcoin and Tesla together. One can even have a combination in innovative ways so you constantly hedge your position, For eg: BTC/ETH or 2x(BTC)/0.5x(iBTC) hybrid, just like strategies in options trading, but without all the complication. The possibilities are limitless. There would be numerous advantages of using this method of hybrid tokens. Few of them are listed below:
 - a. User no longer needs to do multiple transactions to buy or sell the tokens.
 - b. Save on the gas fee, time and slippage as it reduces your transactions.
 - c. No need to visit multiple platforms for stocks, crypto, commodities and forex.

4. LP token minting: One of the biggest risks with minting platforms is the volatility which can lead to liquidations (and flash crashes leading to serial liquidations). Our Derived platform would allow users to provide LP (like on Uniswap or Sushi) and then stake those LP tokens (For eg: DVD/ETH) to mint the xUSD on the platform. The LP tokens are less volatile than a single asset (in this case DVD) and thus reducing the risk of liquidation. The table below shows the price fluctuations and resultant change in LP value versus the token value.

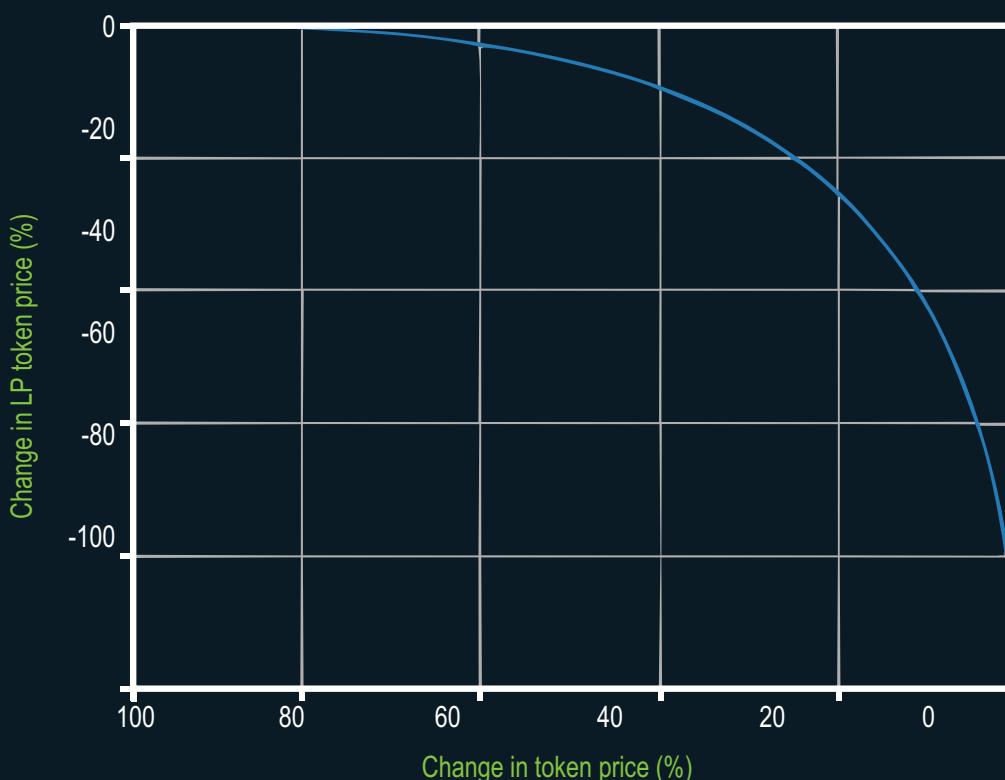


Figure: Simulation showing the graph plotted against change in token price vs. the change in LP token price in terms of percentage.

5. 24x7 trading: The platform will allow the traditional traders to trade on conventional assets like stocks, commodities, etc., round the clock and in a decentralized environment from anywhere in the world without any boundaries, middlemen, or censorship. However, the minting function of the regulated securities are limited to market hours. Trading of these securities is possible from the liquidity pool which does not have any price appreciation outside market hours. Time contract will make sure the minting function is adhering to the market hours based on the securities and its geography.

6. Bridging traditional market with Blockchain: The blockchain is a trust less, open, non-custodial, and censor-proof environment. It also creates the transparency to the users which are absent in the traditional financial markets.
7. 0% slippage: The synthetic assets on the derived by nature will have 0% slippage unlike the other traditional decentralized DEX and trading platforms.
8. Low gas fee: The derived will be built on Polkadot substrate, thereby enabling to use the low gas fee and higher transaction throughput.
9. Unlimited liquidity: For trade in any conventional market there is a buyer and a seller. If there are not enough buyers or sellers for an asset, then it does not have any meaningful liquidity to allow successful trading. Our platform will have almost unlimited liquidity, since the price of the asset is pegged using an oracle and there is no need of a seller for a buy order or vice versa.
10. Building on the substrate framework and Polkadot ecosystem: This gives great interoperability function to our derived protocol, which can be used to leverage the liquidity for other protocols as well as provide liquidity to other synthetic

Main components of Derived Finance

Derived Finance will be derived based on the Substrate framework. We will make use of the highly customizable framework from substrate to build on the Polkadot. The Polkadot ecosystem provides innumerable advantages over Ethereum^[6]. The native tokens of the network will be DVD. The Emission Curve along with staking rewards in blockchain and staking rewards in protocol will be explained in the Token Economics section.

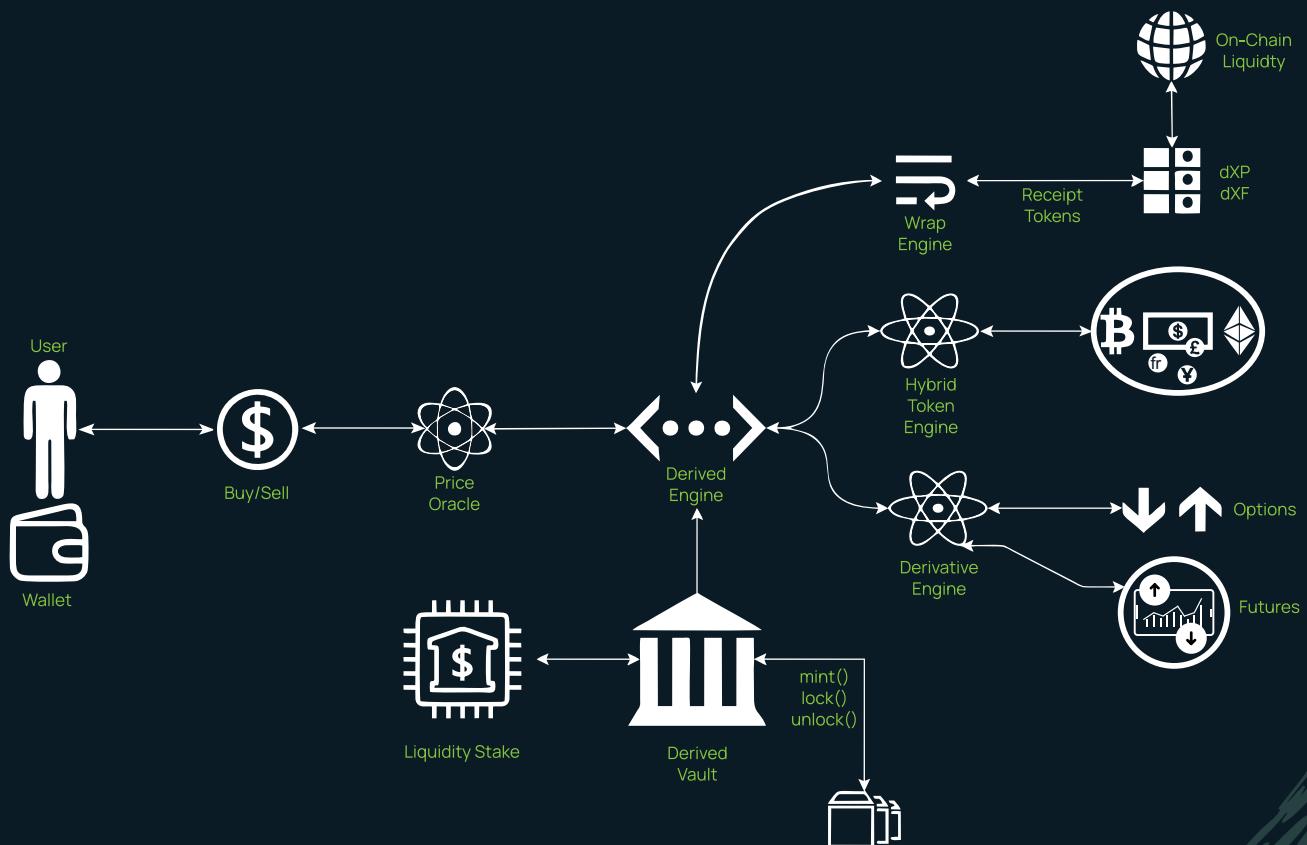


Figure 1: Protocol Overview of Derived Finance

Protocol Overview

These are the following main roles in the derived finance protocol:

- Protocol Staker (To stake DVD tokens / LP tokens and mint Synthetic tokens xUSD)
- Trader (To Trade the xUSD tokens to various synthetic assets)
- Liquidity Provider (To provide Liquidity to DVD tokens and mint DVD tokens. This is to encourage people to provide liquidity as well as reduce wild swing in prices)
- Governance Voting (To vote on new proposals and whitelist addition of new

Protocol Staker

Protocol Staker is a user that stakes either LP Tokens or DVD tokens in order to earn staking rewards as DVD tokens. There will be no penalty to withdraw the LP tokens staking or DVD tokens staking. However, to encourage users to stake the LP or DVD tokens, the token emission will be more rewarding in the bootstrap phase. Once sufficient liquidity is gained, the curve will smoothen out the rewards.

Trader

The trader is the one who trades the synthetic assets on the decentralized exchange on derived protocol. The trader pays a fee of 0.3%, which will be distributed to the LP tokens/protocol token stakers.

Liquidity provider

The Liquidity provider provides liquidity to the equal amount of DVD tokens and stablecoins to the liquidity pool. They can then use these LP tokens to stake in the protocol to earn more DVD tokens.

Governance Voting

Any new proposals to change the protocols, any proposal to fine tune the parameters or whitelisting of new synthetic tokens will be done via on-chain governance voting. We will make sure the threshold of governance voting is not so high so that even in the initial bootstrap phase, users can vote on proposals^[7].

Oracle and CDP

Oracles:

The main function of oracle is to provide the price feed of assets from the external world to the blockchain. There are a couple of solutions which we thought about. However, we went on a simple way of integrating with an existing price feed API provider to simplify the process as it gives us the leeway to not design another protocol for aggregating the prices. We studied the proposal of Schellingcoin^[8] and some protocols like UMA/mirror use a form of this method of getting the price feed. We went ahead with integrating with existing decentralized oracles in order to not complicate our protocol at the beginning. However, changing the price feed based on native tokens voting using the Schelling Point style voting system can be

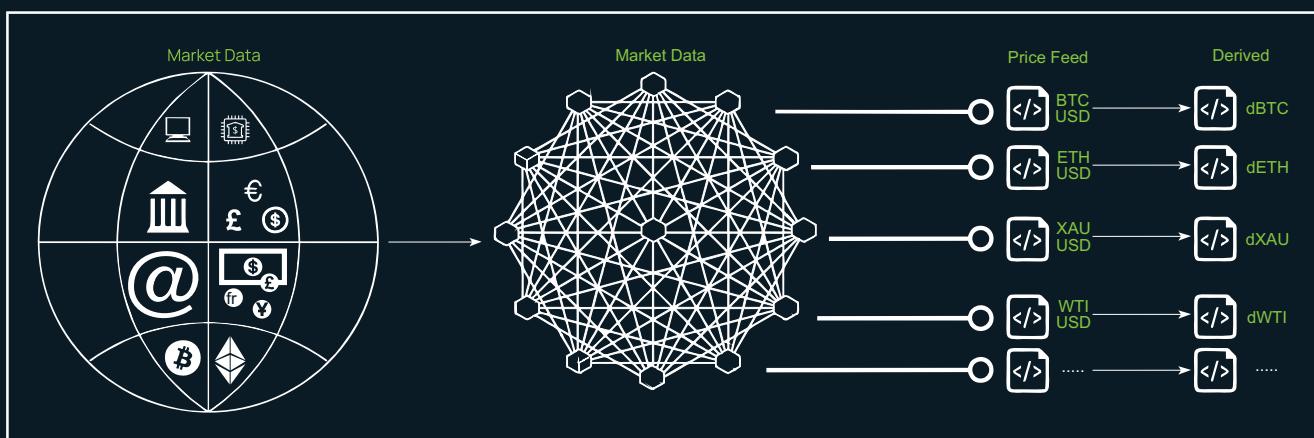


Figure 2: Illustrating the use of decentralized oracles to fetch the real world market data and connect to Derived protocol

Collateralized Debt Position (CDP) and the Debt Pool (DP):

Collateralized debt position (CDP) is created when the users stake DVD tokens and mints the platform native stablecoin xUSD. The xUSD token will always be pegged to 1 USD and the token will be required to trade/participate anywhere on the platform. So, if a user stakes their DVD tokens and mints 100 xUSD, then he also creates a debt of \$100 USD. This debt is shared between all the stakeholders in the protocol and needs to be paid off before the user can unstake their DVD tokens. This collective debt is also known as the debt pool. Every user needs to maintain a minimum Collateralization Ratio (CR) for minting xUSD.

$$DP_{\text{initial}} = \text{total xUSD minted on the platform}$$

$$CR_{\text{mint}} = CR_{\text{base}} / I_{\text{mint}}$$

CR_{mint} = Minting Collateralization ratio

I_{mint} = Leverage used for minting

The markets can be volatile and after the user mints the xUSD tokens the price of DVD may go up, which will lead to freeing up proportionate staked DVD tokens. The free DVD tokens will be available to the user to withdraw. Alternatively, the user can also opt to mint additional xUSD with the same number of DVD tokens and to maintain the desired CR. If the price of DVD tokens goes up so much so that the CR goes over CR_{ceiling} , then users would be required to mint more xUSD on the platform to continue to receive the staking rewards.

Total DVD Tokens	Locked Tokens	Extra that can be Locked (Unlocked)	Price per Token	Total USD Value	C-Ratio (Required)	C-Ratio (Current)	xUSD Minted
1000	1000	0	\$2.00	\$2,000	500%	500%	\$400
Case 1: Price of \$DVD Token doubles							
1000	1000	-500	\$4.00	\$4,000	500%	1000%	\$400
1000	1000	0	\$4.00	\$2,000	500%	500%	\$400
1000	1000	0	\$4.00	\$4,000	500%	500%	\$800
Case 2: Price of \$DVD Token goes down by half							
1000	1000	+1000	\$1.00	\$1,000	500%	250%	\$400
2000	2000	0	\$1.00	\$2,000	500%	500%	\$400

(Effect of token price on C-Ratio and xUSD minting)

There might be similar situations, especially during the initial period of launch of the protocol, when the value of the DVD token will be volatile and the CR may fall below the minimum required. In such case, users will get a grace period to either stake more DVD tokens, or burn some xUSD token to maintain the minimum CR and avoid liquidation. The CR formula is defined below; for users to not get liquidated, they would have to maintain a minimum CR which can also be defined in the formula below. Users will have the option of adding additional collateral to raise their effective Collateral Ratio. The total amount of potential mintable xUSD tokens is then increased by the corresponding added collateral.

Liquidation Process:

The Liquidation mechanism of the Derived protocol is inspired from Synthetix and MakerDAO^{[9][10]}. The Liquidation occurs when the CR falls below the liquidation threshold. There are two types of liquidation thresholds known as Liquidation CR or CR_{min} and Forced Liquidation CR or CR_{Liq} respectively.

$$Cr_{min} = \text{Liquidation CR}$$

$$CR_{Liq} = \text{Forced liquidation CR}$$

If the price of token fluctuates and the CR falls below the CR_{min} the user gets a grace period to fix the CR. However, if the price further falls and CR becomes less than CR_{Liq} then there will be no grace period and the account would be instantly liquidated.

Synthetic assets can be redeemed for staked DVD tokens at a discount if the collateral ratio of a staker falls below the liquidation ratio i.e. CR_{min} or CR_{Liq} . Liquidation can be initiated by any DVD token holder. It ensures the health of the protocol is maintained as the assets are not over collateralized.

Liquidator Role:

Anyone can burn their xUSD tokens to become liquidator by calling to check the address for liquidation. The below diagram illustrates how the liquidation process is initiated.

CDP Liquidation Process

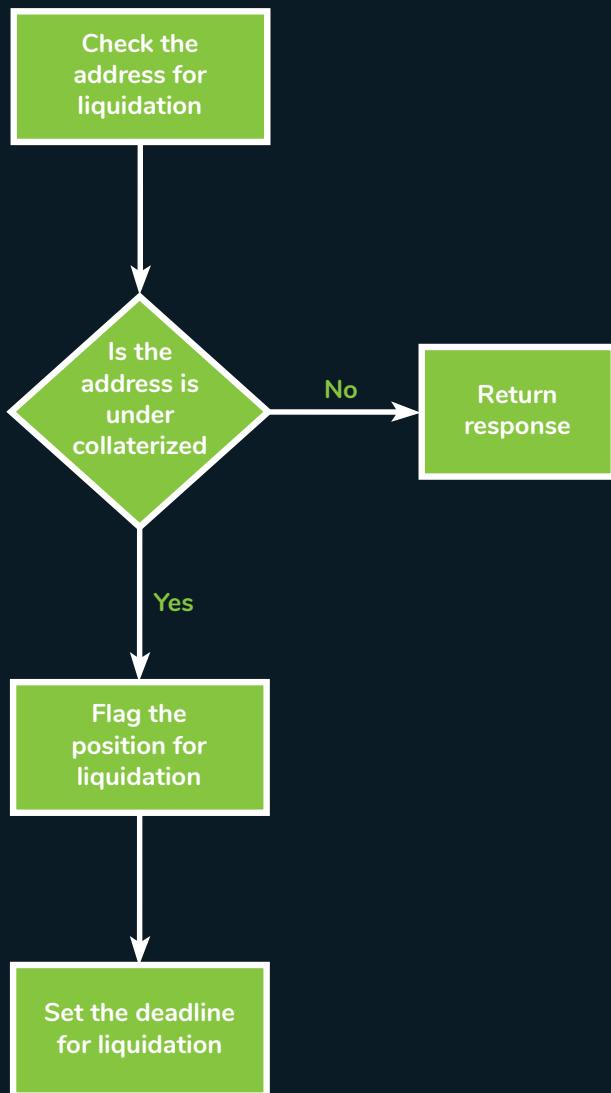


Figure 3: Diagram showing the first stage of liquidation process

Liquidation process

Once the account is flagged and the deadline is reached for liquidation, the following events will happen.

Liquidation

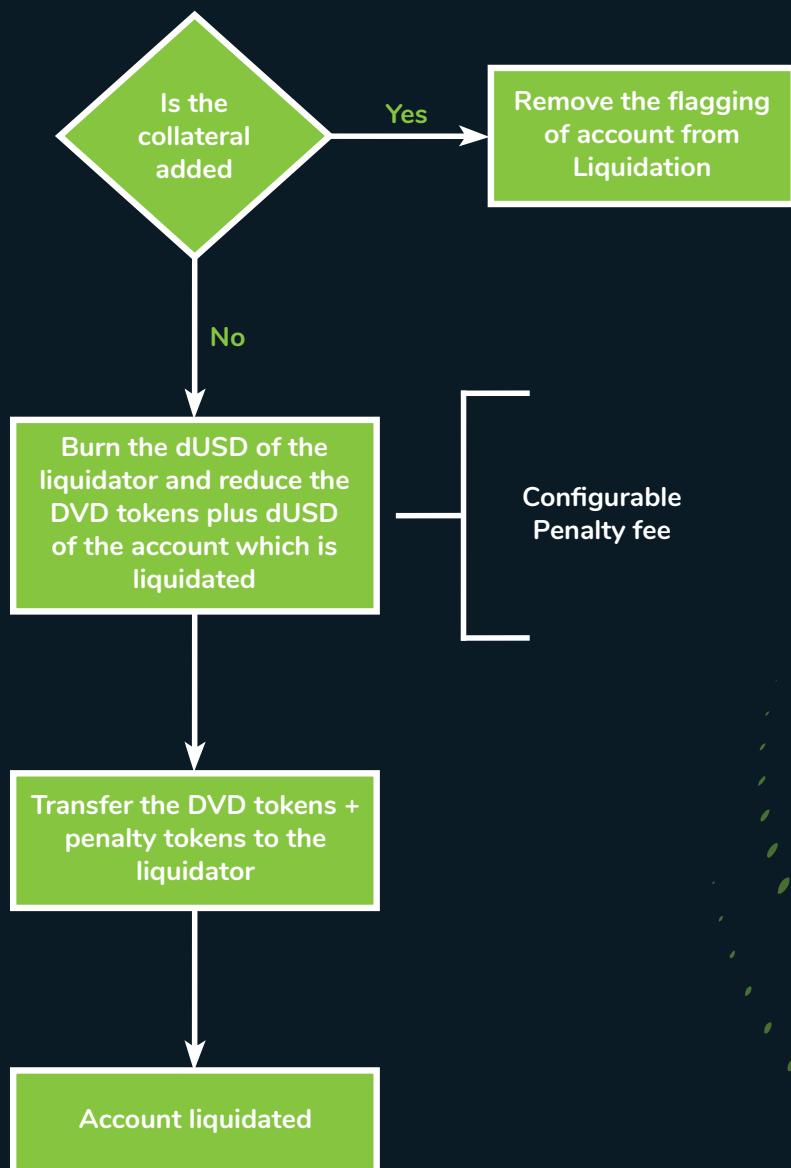


Figure 4: Diagram showing the next stage of liquidation process

Token Utility and Use Cases:

- **Staking / Minting:**

The token can be used to stake and mint the native synthetic USD, (let us say xUSD) or any other fiat-based stablecoin on the platform. The token shall be used inside the platform for all necessary activities and is thus the centrepiece for all economic activity. The minting of the stablecoin shall be made possible using the joint debt pool concept. The stakers who mint and maintain the IR within the desired range shall receive staking rewards for maintaining liquidity in the platform. Before unstaking, the users will be required to burn their synthetic xUSD and payoff their debt.

- **Fee generated on the platform:**

The users who will stake and mint the xUSD on the platform shall also receive the proportion of fee generated on the platform in ratio of their stake in the staking pool. The fee generated will make sure that the incentive for stakers continues after the staking rewards end.

- **Governance:**

The DVD token shall also allow holders to participate in the governance of the platform.



STAKING



FEE



GOVERNANCE

Conclusion

We presented the concept of synthetic tokens to be issued on blockchain with zero friction and has the potential to break the barriers of geography - which will enable the people from all over the world to invest in the synthetic asset class. Derived well designed system will enable the people to create

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