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Introduction

OlympusDAO is a Reserve Currency Protocol functioning as a Decentralized Autonomous Organization primarily dealing with Decentralized Finance over the Ethereum blockchain. While there exist multiple instances of Decentralized Finance other than OlympusDAO such as Curve, Sushi, Compound; OlympusDAO intends to and (to a great extent) actually achieves the goal of achieving a truly community-controlled financial infrastructure. The regular Decentralized Finance solutions usually remain contained to being a replica of traditional finance with the added perks of being on-chain and hence decentralized. OlympusDAO sets out to break through the stagnation of the current state of DeFi and create a unique working model. OlympusDAO has a meticulous working model which can give us some interesting insights after we are done analyzing it.

Their working model derives a lot from game theory and thus makes for a fascinating research project. We will be covering some crucial aspects attached to OlympusDAO ranging from understanding bonding and staking; differentiating between being backed by a currency to being pegged to a currency; the game theory between (3,3) and understanding how the prisoner's dilemma ties into their working model.

Review of Literature

https://en.wikipedia.org/wiki/Decentralized_autonomous_organization

We are using Wikipedia to familiarize ourselves with how a DAO works and to look at some major examples of it.

<https://docs.olympusdao.finance/main>

We would be looking at the official documentation on the OlympusDAO website to further gain precise knowledge about how the system works. Further, we will be following the official instructions to understand the working, and we will also operate and interact with their systems as a part of this research study.

https://en.wikipedia.org/wiki/Game_theory

Game Theory is a vast subject on its own and consists of a lot of nuances but for our sake we will be broadly looking at game theory related concepts in hopes of deriving value to our research; particularly we will be looking at the famous prisoner's dilemma:

https://en.wikipedia.org/wiki/Prisoner%27s_dilemma

Objective

This study aims to understand the economics and game theory associated with OlympusDAO.

- Understanding Decentralized Finance and psychology behind stable-coins
- Inflationary effects on DeFi, the dollar and Olympus' solution to it
- Understanding the Reserve Currency Protocol and juxtaposing it with the Federal Reserve
- The economics behind Ohm (Olympus' Native Asset).
- Staking, bonding and understanding (3,3)/prisoner's dilemma.

Significance of the Study

The world of finance is undergoing a massive shift in the way it functions and there are numerous exciting solutions being built to iterate on our existing traditional finance model. Studying one such model in depth will give us valuable insights inside economics and new-age decentralized finance.

We will also be familiarizing ourselves with the operations/requirements associated with interacting with Ethereum blockchain and corresponding wallets and the methods associated with funding wallets and off/on-ramping to the entire ecosystem.

Research Design:

1. Setting up our wallet and funds: We will be creating a new ERC-20 wallet using the browser extension Metamask (securely storing away our seed phrase). We will be using a Centralized Exchange namely FTX to purchase Ether to be used over the Ethereum blockchain. We will withdraw our Ether to our aforementioned Metamask wallet to be used with the protocol.
2. We will be connecting our wallet to the protocol (Figure 1) and then staking our funds and buying a few bonds to understand the working and the process associated with using the protocol.
3. We will be documenting the entire process and logging our final results after a month.

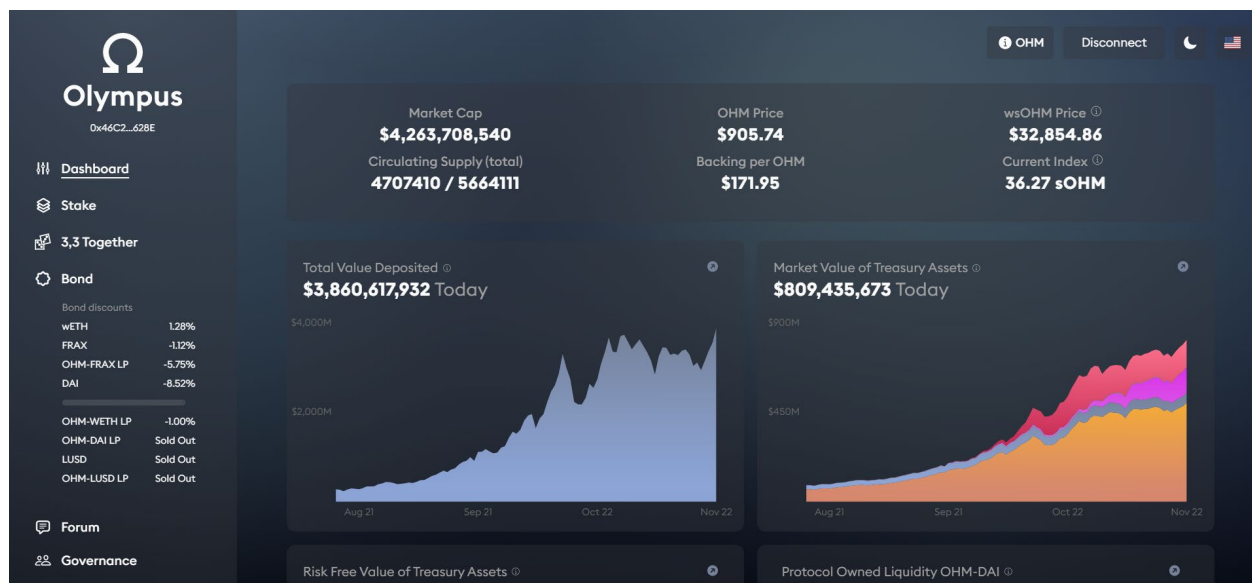


Figure 1

Results and conclusions:

Let's look at the results in the same format as the subsections defined in our Objective.

1. Decentralized Finance and Stable-coins:

Decentralized Finance has a numerous number of protocols and websites with which people interact regularly and use it to satisfy their monetary needs. These protocols usually have a big amount of Total Value Locked (TVL) in their systems through various financial instruments. While, DeFi is available for a lot of crypto-assets; people prefer to use stable-coins for their needs as they seek to minimize their risks while keeping their yields high.

Stable-coins are cryptocurrencies which are pegged 1:1 to US dollar i.e., for every 1 stable coin issued there is an alleged corresponding US Dollar in their reserve and ideally you should be able to exchange your stable-coin for a Dollar or vice versa if you so wish to; and the value of the stable-coin ideally remains identical to a dollar.

There are further iterations of stable-coins with algorithmically-backed stable-coins where their peg might be lesser than 1:1 reserve but they would use another asset alongside an algorithm to emulate that 1:1 peg.

Some popular stable-coins are: USDT, USDC, DAI. (In descending order of their corresponding market capitalization).

2. Inflationary effects on DeFi, the dollar and Olympus' solution:

Inflation causes rapid decline in the purchasing power of all modern currencies.

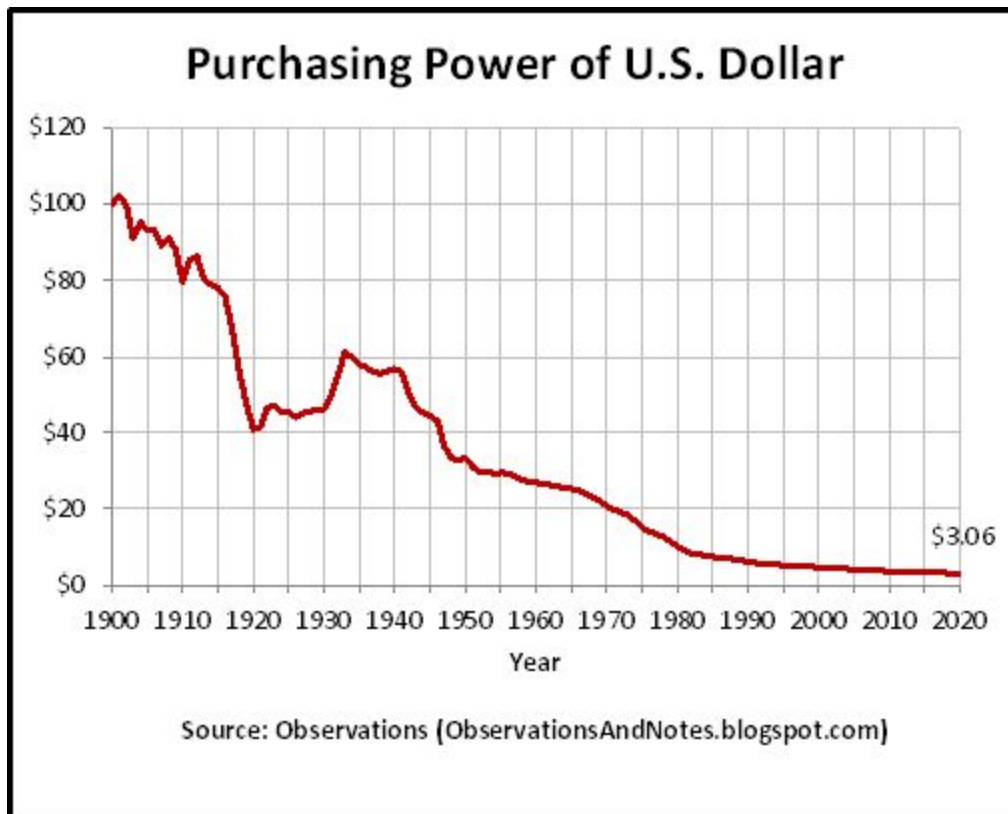


Figure 2

While DeFi aims to improve traditional finance, stable-coins still suffer from the inflationary wormhole where the assets constantly depreciate in their corresponding purchasing power and while the high yields of around 7-8% APY aims to mitigate this, it still isn't enough.

Enter Olympus; Olympus aims to solve this by making their reserve currency i.e., Ohm, not be pegged to a dollar rather be backed by a dollar (DAI stable-coin) and hence achieving a floating market price in attempts of retaining purchasing power overtime.

3. Understanding their reserve currency protocol and comparing it with the federal Reserve

As is known that Federal Reserve and Central Banks manage their currencies by controlling their reserves. OlympusDAO aims to serve similarly except they will be managing their own crypto reserve assets.

The major difference being that the changes/decision would occur through the votes of all community members as opposed to a select few as is the case with major banks/reserves.

4. The economics behind Ohm

Olympus Treasury backs each OHM token by a selected number of crypto-assets (examples being DAI, ETH) in their reserves.

The floating market price is regulated as:

If OHM is trading above the backed-asset price of it, the protocol will mint new tokens and hence will increase the supply of the token.

If OHM trades below the backed-asset price of it, the protocol will automatically buy back those tokens and then burn those tokens and hence reducing supply.

This in turn makes the OHM token achieve a floating market value while also remaining Stable; as the token price can not fall below the backed asset value.

Further, the protocol sells bonds to users at a discount; where in exchange of a treasury asset users can receive OHM at a discount with a certain lockdown period which can then further be sold at a profit if the user so wishes to; and which will in turn keep the OHM backing in place and also provide additional liquidity to the protocol and this new batch of assets are further used to back OHM being minted and supplied to the stakers (we will study staking in the next section).

5. Staking, bonding // (3,3) // Prisoner's Dilemma

Staking:

Staking can be understood by drawing a parallel to traditional finance, particularly, the way banks offer interest on your deposits annually. OHM lets the owners of the OHM token stake in on their platform with auto-compounding but with APY upwards of 7,000% annually.

Bonding:

User can sell assets to the treasury to receive OHM at a discounted price with a certain lockdown period resulting in a profitable arbitrage trade.

Prisoner's Dilemma and (3,3):

The famous prisoner's dilemma in game theory describes a hypothetical situation as follow:

Figure 3

Two members of a criminal organization are arrested and imprisoned. Each prisoner is in solitary confinement with no means of communicating with the other. The prosecutors lack sufficient evidence to convict the pair on the principal charge, but they have enough to convict both on a lesser charge. Simultaneously, the prosecutors offer each prisoner a bargain. Each prisoner is given the opportunity either to betray the other by testifying that the other committed the crime, or to cooperate with the other by remaining silent. The possible outcomes are:

- If A and B each betray the other, each of them serves two years in prison
- If A betrays B but B remains silent, A will be set free and B will serve three years in prison
- If A remains silent but B betrays A, A will serve three years in prison and B will be set free
- If A and B both remain silent, both of them will serve only one year in prison (on the lesser charge).

The outcomes can be quantified as follow in a matrix:

Figure 4

**Standard prisoner's
dilemma payoff matrix**

A \ B	B	
	B stays silent	B betrays
A stays silent	-1 -1	0 -3
A betrays	0 -3	-2 -2

Similarly, we can apply this theory to Olympus in a way that if everyone cooperated while using Olympus, it would result in the maximum gain for everyone involved.

We can quantify them as:

Staking (+2)

Bonding (+1)

Selling (-2) and hence we get the resulting matrix as:

Figure 5

	Stake	Bond	Sell
Stake	(3, 3)	(1, 3)	(-1, 1)
Bond	(3, 1)	(1, 1)	(-1, 1)
Sell	(1, -1)	(1, -1)	(-3, -3)

The concluding theory being:

If we both stake (3, 3), it is the best thing for both of us and the protocol ($3 + 3 = 6$).

If one of us stakes and the other one bonds, it is also great because staking takes OHM off the market and put it into the protocol, while bonding provides liquidity and DAI for the treasury ($3 + 1 = 4$).

When one of us sells, it diminishes effort of the other one who stakes or bonds ($1 - 1 = 0$).

When we both sell, it creates the worst outcome for both of us and the protocol ($-3 - 3 = -6$).