Azos: A True Third Generation Liquidity Engine

Kyle Webster, Joshua Heilman

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Abstract

First-and second-generation decentralized finance protocols leak value to unaligned market participants. We evaluate the existing models of MakerDAO and Reflexer Finance and propose improvements through the introduction of a new rules-based class of smart contracts, called The Azos Protocol. We present the modules that allow anyone to perform special upkeep actions and explain how these actions support protocol equilibrium. Finally, we evaluate the proposed Azos mechanics in terms of improved platform value accrual.

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1. Background

1.1. MakerDAO MCD

MakerDAO is a decentralized autonomous organization that operates the Maker Protocol, a decentralized lending and stablecoin system built on the Ethereum blockchain. MakerDAO changed the world by giving us a glimpse into the future of currency, money and asset management. The humble multi-collateral DAI (MCD) showed the world that economic systems could be antifragile, trustless, decentralized and permissionless. MakerDAO's pioneering work in decentralized stablecoins, governance and DeFi are significant achievements in the blockchain space. It became the true first generation CDP protocol.

MakerDAO still had challenges to overcome. DAI didn't scale supply with comparable capital efficiency to centralized competitors. It grew reliant on centralized real world asset providers like Circle's USDC. People became concerned that accepting centralized stablecoins as collateral introduced fragility into the system. Other people were concerned that governance had been subverted. Some of the MKR community began to iterate on the MCD technology design.

1.2. Reflexer GEB

The Gödel, Escher, Bach (GEB) reflex index was born. Reflexer Finance was built on the MCD framework. It minimized governance, eschewed any real world asset collateral and introduced an autonomous redemption rate controller. The autonomous rate controller is an amazing breakthrough technology. Fixed-pegs are brittle. Reflexer is more like a ball player's baseball glove; gracefully anticipating, cushioning and making the catch.

Reflexer had identified that Maker could fall prey to a cost-of-coercion attack; where a participant could accumulate governance power and subvert the protocol to their own benefit. Their "governance ice age" mechanism was deployed to prevent this from happening.

1.3. Capital Efficiency Evaluation

Over time more of the problems of Maker's MCD system have been identified:

- Leaks value to unaligned participants during debt, surplus and collateral auctions.
- Pays premiums to unaligned participants for their stability during arbitrage.
- Doesn't scale up to the demand for stable assets as effectively as a centralized issuer.
- Doesn't direct the flow of value to aligned participants.
- Can be susceptible to cost-of-coercion attacks.
- Has a brittle static peg.
- Stability fees eat into leveraged yield.

Reflexer has other problems:

- Is rigid and only allows a single collateral type.
- Can't respond to the changing environment of DeFi.
- Limited participation because it was a little difficult to understand.

2. Azos Mechanisms

2.1. Inherited Mechanics

The Azos framework sits firmly on top of the GEB reflex index. It uses an autonomous rate controller and inherits the properties of MakerDAO that are in-built to Reflexer. Azos has multi-layered security features, both collateral auctions and debt auctions. Most of the tried and true features from previous iterations remain in Azos. We removed the surplus auction mechanic; and will explore novel ways to distribute protocol owned surplus by governance. The biggest change to the GEB framework is the introduction of the Azos module.

2.2. Azos Modules

Azos modules are comparable to what Frax Protocol has dubbed, "algorithmic market operations controllers" or AMOs. Azos reimagines the AMO as a natural extension of the protocol. Azos modules are similar to a user generated CDP. This means that modules must work within the original tolerances and confines of the MCD and GEB systems. It also means that the inherited debt safety mechanics can rescue modules during extraordinary market turbulence.

2.3. Rules Based Smart Contracts

Azos modules are smart contracts that are capable of autonomously managing protocol resources and debt. At all times, they must abide by two simple rules:

2.3.1. Azos modules must take actions that close the spread between market price and redemption price.

2.3.2. Azos modules must take actions that increase the total equity of system resources.

2.4. Privileges

Azos modules also have some special privileges within the GEB framework:

- They have different approved collateral types, called “backing collateral”.
- They have different collateral ratio requirements and liquidation thresholds.
- They can create system debt up to the limit of their backing collateral.
- They can generate system debt in order to acquire backing collateral.

2.5. Voting Escrow and Fee Subsidies

Azos will also adopt the long tail emission voting escrow token mechanics of Curve. The current state of leveraged yield aggregation has been upended by staking withdrawals and liquid staking derivatives. Azos will seek to maintain an equilibrium between token emissions and protocol fees. This enables much more powerful leveraged strategies and helps to decentralize protocol ownership. It will also make the relationship between token emissions and protocol fees clear to users. This provides a clear pathway for composable applications which supplement the governance process or create advanced strategies using Azos.

3. Scalability and Stability

3.1. Volatility Scales

Azos stable asset supply scales linearly with volatility and liquidity. Anytime the market price is above target; the supply grows. Anytime the market price is below target; the supply shrinks. Each time this cycle occurs; the supply grows by a certain percentage of the total value exchanged. This means any significant variation of the stable asset's market price will increase supply over time.

An Azos module creates debt by holding or acquiring approved "backing collateral" assets. Modules are required to maintain a one hundred percent collateralization. The preferred backing collateral types are decentralized stablecoins; but a certain threshold of centralized stablecoins is acceptable. We will use existing stable assets to bootstrap the growth of Azos. There will be windows where one way conversion of stablecoins to Azos stable assets is allowed. The assets will bootstrap the Azos module's initial backing collateral reserves. We can also open these windows prior to increasing collateral type limits; in anticipation of increased volume.

The Azos module will constantly increase the debt and supply of protocol stable assets. It does this by stabilizing the market price against the redemption price. Anytime there's bi-directional price volatility of the stable asset; the supply will grow. Whenever the Azos stable asset market price pushes above redemption price; the module can flash mint supply and equilibrate the market and redemption price by selling on the open market. At the end of all Azos module transactions, we check the state of the system and module. This check is made against the system module rules: and as long as the rules are abided; the transaction is allowed.

3.2. Supply Growth Modeling

We can model module generated supply growth as:

- The size of the module generated supply at time **t** as **S(t)**
- The volatility of the system as **V(t)**
- The liquidity of the system as **L(t)**
- The constant of proportionality between the increase in size and volatility $\boldsymbol{\alpha}$
- The constant of proportionality between the increase in size and liquidity $\boldsymbol{\beta}$

The growth of supply as a continuous differential function of volatility and liquidity:

$$dS(t)/dt = \alpha V(t)S(t) + \beta L(t)S(t)$$

It's important to note that this model starts to break if a market participant of sufficient size decides to act both as the protocol's liquidity provider and arbitrageur. This is because a market maker who owns a large share of the liquidity provisioned; essentially pays less in LP fees for swaps. Since our model relies on protocol owned accounts being the privileged arbitrageur; the stable asset token will have a deactivated, optional fee on transfer in-built. This provides us with a lever that can shift the dynamics of arbitrage.

4. Conclusion

We conclude that a new protocol using Azos Modules is capable of increased capital efficiency, scalability and value capture by satisfying the demand for stable assets, and on-chain leverage. We've demonstrated the value leakage in current platforms and detail the technologies Azos improves upon. We've displayed how Azos scales proportionately with usage; and has capital efficiency rivaling a centralized stablecoin provider. The protocol captures additional value and abstains from paying external actors to maintain stability. A long-tail emissions strategy will enable long term growth, stability, decentralization and hyper-competitive yield. In conclusion we view a large opportunity to implement the Azos Modules and create the next generation of decentralized finance platforms.

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