Automated asset manager (AAM)

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Abstract

AAM is a new approach in on-chain asset management that enables new types of derivatives such as fully decentralized Index based ETFs. System offers additional functionalities that utilize the underlying capital and enable continuous asset management made by users.

Contents

1 Overview

1.1 Current state of asset management in DeFi

As of the time of writing this article, crypto asset managers are experiencing increasing popularity, likely driven by several potential factors, including:

1. **Asset Growth:** Situations arise where users desire to manage a substantial amount of value within their portfolio, a task that becomes complex when done manually.

2. **Increasing Trading Frequency and Protocols for Yield:** The rise in trading frequency and the availability of various protocols offering yield opportunities create a challenge for users to frequently update their portfolios and identify suitable risk-to-yield ratios.

Despite the existence of different protocols attempting to address specific local asset management cases, they have certain limitations:

1. **Centralized Systems:** Systems that present their portfolios as an ERC20 equivalent of stake on-chain are efficient but exist outside the DeFi realm, making them unsuitable for many users.

2. **Decentralized Application-Based Systems:** Systems relying on decentralized applications that hold users' funds and provide access for a trader role to execute operations. While flexible and granting access to leverage tools, these systems typically impose limitations on the number of assets per portfolio, usually fewer than 20 assets.

1.2 Dictionary

Multipool - A smart contract that uses AAM mechanism.

Underlying assets - Assets that are managed by multipool.

Target share - Asset share that is a current goal for AAM strategy.

Current share - Asset share that multipool currently keeps.

Deviation - Difference between current and target share.

Multipool Cap - Market cap of multipool being sum of usd value of all underlying assets.

Oracle - A system that multipool trust to set prices and target shares.

Base fee - Fee that is instantly charged for operation.

Deviation fee - Fee that is charged according to deviation changed.

Depeg rate - The measure of distance between current and ideal asset proportions in multipool.

Dex - Decentralized exchange.

TWAP - Time-weighted average price. An analytical price measurement.

TVL - Total value locked. The measurement of some value that particular financial unit contains.

2 Automated Asset Manager

2.1 Basic Concepts

Before delving into fundamental concepts, it's important to clarify that multipool mechanics are integral to various operations, including minting, burning, and swapping. These mechanics will be thoroughly explained in later sections of this paper.

2.1.1 Deviation

An AAM is embodied as a smart contract that holds a set of assets and enables a range of operations to be conducted according to a specific set of rules. The combination of these rules empowers the AAM to effectively manage the underlying assets with flexibility.

The concept of DeFi-inspired portfolio management aims to maintain the inner asset quantities as closely aligned as possible with those dictated by the chosen strategy. AAM works with shares denominated in ETH or any other comparable unit to facilitate the comparison of asset quantities.

Deviation serves as the fundamental metric used to quantify the difference between the current asset share and its target share according to the strategy. In this paper, we also link deviation with the depeg rate. For a specific asset, the deviation delta indicates the change in the depeg rate for the entire portfolio.

To compute the current share, AAM divides the total ETH value of an asset by the multipool's ETH capitalization. Deviation is inherently a

signed value, although typically, it is necessary to focus on the absolute measure.

$$S_c = \frac{Q * P}{M}$$

$$D_c = \left| S_c - S_i \right|$$

Where Q - asset quantity, P - asset price, M - current Multipool market cap, D_c - current deviation, S_c - current asset share in AAM, S_i - ideal asset share in a Multipool.

2.1.2 Fees

The deviation parameters mentioned earlier are influenced by operations that impact the quantity of assets. Fees play a vital role in ensuring that the AAM maintains its peg and also contribute to the revenue of AAM maintainers. There are two types of fees in the multipool:

The Base Fee remains constant regardless of the deviation and is typically a modest fee collected by the AAM owner.

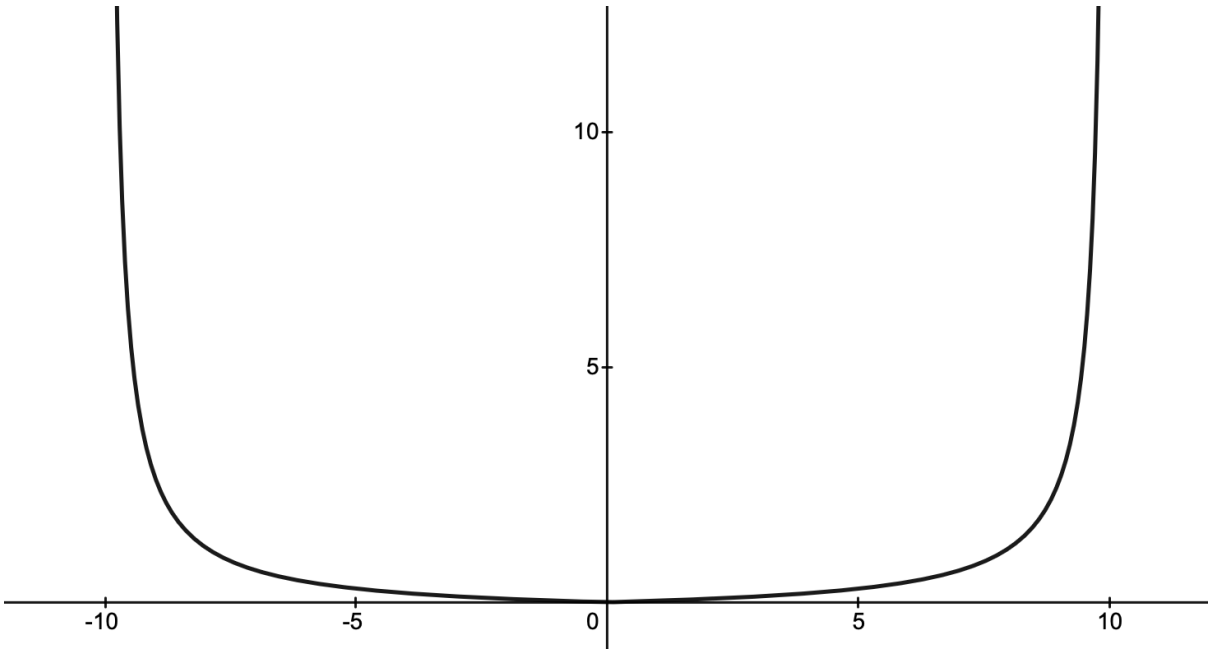
The Depeg Fee serves the dual purpose described above. It is used to make operations that could potentially lead to the depegging of the AAM portfolio economically less appealing, considering the depeg rate. A portion of these fees goes to the owner, similar to the base fee, while the other part is allocated for cashbacks, as detailed in the following section. The multipool benefits significantly from operations that reduce the deviation. If, after an operation, the deviation decreases by its absolute value, no depeg fee is levied.

However, the key concept is to impose fees for operations based on the deviation that arises as a result. The specific proportions and objectives of these fees may vary depending on various factors.

The Depeg fee ratio is contingent upon the deviation that arises following specific operations. This ratio is structured as a curve governed by two key parameters. The first parameter, known as the 'deviation limit,' acts as an asymptote, preventing any operation from increasing the deviation excessively by rendering the fee infinite. The second parameter, referred to as the 'half deviation ratio,' signifies the fee ratio charged when the deviation reaches half of the deviation limit.

$$F = \frac{HD * |d|}{(|d| - D_l) * D_l} + F_b$$

Where D_l - deviation limit, HD - half deviation ratio, F_b - base fee, d - deviation. Here is visualization of this fee curve with HD = 2.9, $F_b = 0$, $D_l = 10\%$.



Fees are collected in the quantity of a specific asset whenever that asset's quantity is altered through an operation. Nevertheless, it's possible for the deviation to exceed the specified limit due to fluctuations in the asset's price. When this occurs, operations aimed at reducing the deviation will proceed as usual, but any actions intended to increase the deviation will be constrained.

If a change in asset quantity results in a deviation change in sign, but the absolute value of the deviation becomes smaller than before, no depeg fee will be applied. Even if this is a high-volume operation with a significant impact on AAM, it remains advantageous because it reduces the overall efforts needed to attain equilibrium with the target shares.

2.1.3 Cashbacks

Essentially, cashbacks are incentives provided to users who shift the underlying asset shares of a multipool closer to the peg.

Within the AAM mechanism, cashbacks are realized through the collection of depeg fees from previous depegging operations, which are subsequently distributed to users who reduce the deviation. The distribution of cashbacks is directly proportional to how closely your operation brings the deviation to zero. For instance, if you reduce the deviation from 10% to 2%, 80% of the previously accumulated cashback amount will be distributed.

$$Q_f = \frac{(D_n - D_o) * Q_c}{D_o}$$

Where Q_c - asset's collected by fees quantity, Q_f - additional fee quantity to receive. D_o - previous deviation rate, D_n - previous deviation rate.

Nonetheless, this form of incentivization is susceptible to MEV (Miner Extractable Value) attacks. When you place a substantial order, an attacker can exploit the situation in the following manner:

1. He can increase the deviation prior to your order by prioritizing their transaction ahead of yours in the transaction pool.

2. Subsequently, they can drive the deviation to zero, allowing them to collect all the depeg fees generated by your action once it is executed.

This concern is a recognized issue across various DeFi decentralized exchanges and is typically mitigated through the use of slippage mechanisms.

Numerous alternative methods for cashback distribution are available. These methods can involve distributing cashbacks gradually over time and can be contingent on various factors, including:

1. The current deviation rate, aimed at ensuring that incentives align fairly with the efforts expended to achieve equilibrium.

Price volatility, intended to enhance AAM stability by providing higher rewards during highly volatile periods.

2. **The status of token integration**, with the intention of offering substantial cashback incentives for new assets to expedite their integration into AAM.

While there could be numerous other factors to consider, all these mechanisms are designed with the objective of enhancing the capital efficiency of incentivization.

2.2 Multiswap

2.2.1 Mechanic overview

AAM's primary utility lies in asset swapping, allowing users to exchange underlying assets or multipool shares in various combinations and quantities. The flexibility extends to any number of input and output assets, with the primary limitation being the gas cost, which scales proportionally with the number of assets involved. The subsequent sections detailing minting and burning operations essentially represent a specialized form of swap. In minting, AAM shares are swapped for assets, while in burning, assets are swapped for AAM shares. Operations are considered swaps when they exclusively impact underlying assets without affecting mint or burn processes.

Within AAM portfolio operations, users have the flexibility to either increase or decrease asset quantities, converting assets into AAM shares or other assets. AAM shares serve as the core utility of the AMM, constituting a proportional stake in all underlying assets. These shares dynamically adjust as asset quantities change, providing an accurate representation of the current state of the AAM portfolio. The formula presented below illustrates the calculation of AAM shares.

$$Share = \frac{Q * P}{P_s * TS}$$

Where Q - asset quantity, P - asset price, Ps - share price, TS - share total supply.

AAM operations compute the quote value of the input amount and provide output token quantities that are equivalent in quote value.

$$\sum_{k=1}^{n_i} Q_{ik} * P_{ik} = \sum_{k=1}^{n_o} Q_{ok} * P_{ok}$$

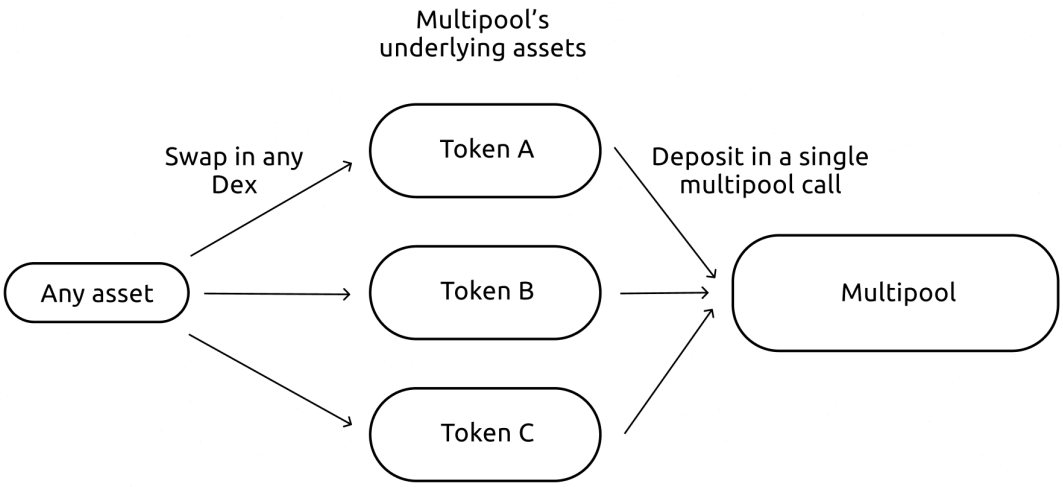
Where: n_i - input asset number; n_o - output asset number; P_{ik} - kth input asset price; P_{ok} - kth output asset price; Q_{ik} - kth input asset quantity; Q_{ok} - kth output asset quantity.

This operation also necessitates supplying fees in the native token. Using the native token for fees ensures convenience for various users, avoiding the receipt of cashbacks in tokens they do not actively trade and streamlining protocol fee collection.

2.2.2 Multiswap deviation limitations

Despite Multiswap being a versatile functionality applied in various scenarios, its initial purpose was to address the liquidity bootstrap challenge for Multipool. Typically, if there is a sufficiently large Total Value Locked (TVL), one can utilize cost-effective minting through a single asset provided to Multipool. However, achieving this becomes challenging in low TVL situations.

The deviation limit serves to restrict substantial swapping operations, aiming to prevent depegging that may occur with pairs of swapped assets. When dealing with significant minting or burning orders, it becomes feasible to execute them with multiple tokens being deposited. In such cases, Multiswap accommodates the operation by calculating a new deviation for each asset based on the overall effects of the entire operation.



There are additional advantages to this approach:

1. Cost-Efficiency: This swap is economical compared to numerous small-amount swaps. However, it's essential to note that the gas cost increases linearly with the number of assets used.

2. Flexible Token Deposits: A user can supply a single token, which can be swapped for multiple underlying assets of Multipool and efficiently deposited through Multiswap.

2.3 Prices

2.3.1 Underlying assets price oracles

In the realm of asset operations, where price is a momentary and inherently subjective measurement, AAM relies on analytical metrics for effective implementation. The prevailing and optimal approach involves the utilization of diverse on-chain pricing mechanisms. The Multipool serves as the designated platform for on-chain asset management, underscoring the importance of underlying assets having a trading presence beyond the Multipool for Multipool's stable functioning.

AAM commonly employs Uniswap v3 TWAP (time-weighted average price), a secure and on-chain aggregated analytical metric intricately linked to a Uniswap v3 pool. The Multipool mandates the standardization of all prices to a uniform quote value. Within the operational mechanics of AAM, the specific choice of a quote is inconsequential.

But it's important that the chosen quote assets are secure and have enough liquidity compared to other tokens. Typically, native tokens of the blockchain are used for this, making fee calculations simpler because they are determined and charged in the native token.

2.3.2 Share price on-chain oracles

The challenging aspect is how AAM addresses the issue of calculating shares using the share price. Essentially, determining the share of a portfolio involves adding up the quote values of all underlying assets, which can be computationally intensive. AAM addresses this challenge

by employing an on-chain price oracle established through an on-chain trading pool with shares and quote assets located external to AAM. Assuming this trading pool has sufficient liquidity, we can leverage its price as the share price for AAM.

While the earlier part is correct, using a separate pool for the share price can cause a loss in portfolio assets, leading to a dilution of portfolio shares. This happens when an asset is either overpriced or underpriced, causing users making operations with a share of the entire portfolio or portfolio shareholders to lose value.

Yet, since the share price shares similarities with regular price, minor fluctuations may not result in significant fund losses. The share price influences two key mechanisms:

1. **Minting and Burning:** A slight inaccuracy can either lead to dilution for all shareholders or make operations less advantageous for users.

2. **Charging Deviation Fees:** In this mechanism, a small inaccuracy in the share price prompts AAM to peg to slightly different asset proportions. This is acceptable when the required proportions continuously change due to price fluctuations.

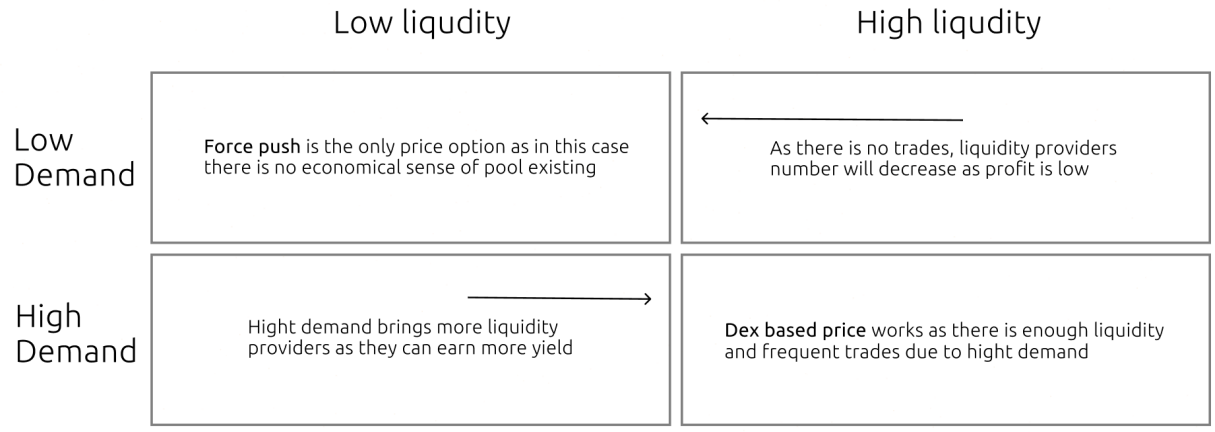
If we employ a Dex based share price oracle, similar to the ones we use for underlying assets, users holding shares will contribute them as liquidity to the pool. Since the share price is derived from the prices of underlying assets, there is always a predictable price that is advantageous for trading (the fair price sums all underlying asset prices proportionally to their current portfolio shares). It's essential to

effectively manage liquidity and ensure it is regularly updated with the true share price to prevent any loss of funds.

When there is sufficient demand for utilizing the Multipool share, obtaining the share price from the Dex proves to be successful and capital-secured. However, if the share is overpriced, users conducting operations may incur losses, leading them to refrain from transactions. In such cases, liquidity providers may adjust the price to the fair value to optimize their profits and align with economic reasoning, as assumed. Additionally, if there is liquidity and capital within the Dex and the share is either overpriced or underpriced, liquidity providers may experience losses due to the profitability of analytical arbitrage.

Furthermore, in scenarios where there is both liquidity and capital within the Dex and the Multipool share is either overpriced or underpriced, liquidity providers may incur losses. This is because arbitraging with the analytical price would be a profitable strategy in such circumstances.

This plan details all potential combinations of situations involving liquidity and demand. However, in certain instances, a distinct mechanism known as "force pushing" of the share price is needed, as explained in the section below.

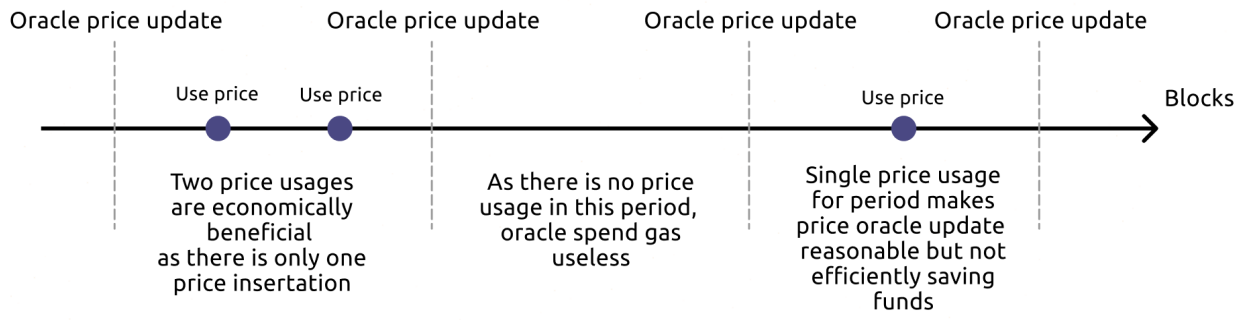


2.3.3 Force pushing share price

In the table above, every scenario is covered except for the one involving the "force pushing" of the share price. Low demand is a notable case, particularly since AAM operates as a permissionless system, and many pools might be initially small. When the AAM pool is launched, the demand for shares is low, making it challenging to sustain the Dex-based share price at its intended level. This challenge arises because more money is lost on liquidity management than earned, given that liquidity requires active management and must align with the analytical share price to generate profits.

In such situations, we can utilize an off-chain oracle. Typically, oracles need consensus and on-chain price settlement, regardless of how

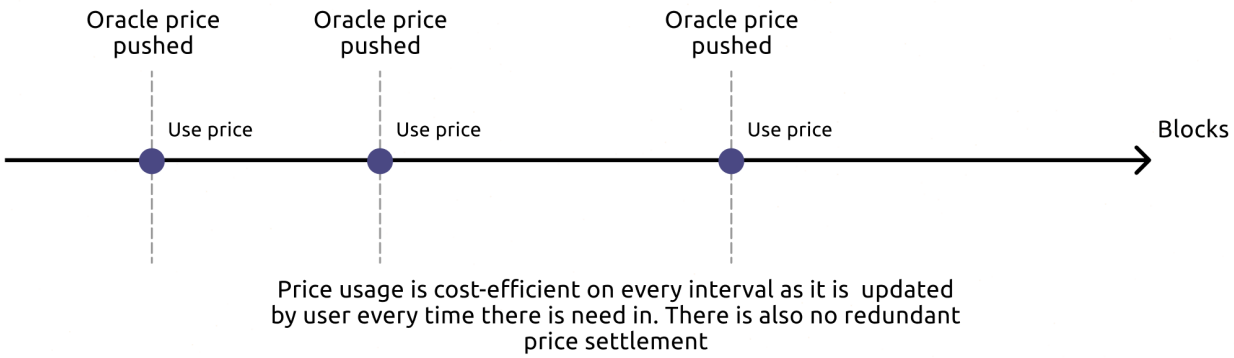
frequently they are used, which can incur high gas costs for maintenance. This approach proves beneficial only when there are multiple usages per each interval between price settlements. Modern cryptocurrency solutions that demand frequent price updates devise strategies to manage the high costs associated with frequent updates while ensuring the prices remain current.



The AAM solution operates by utilizing off-chain signed data that users include with their transactions. In this setup, users pay gas for the necessary price changes related to their actions, offering a fair solution to the issue of continuous price adjustments. However, this system may not be the most efficient when transaction frequency is high. This can be addressed by implementing price caching for a short time interval.

The force pushing of share price is an action that bypasses obtaining the share price from an on-chain Dex-based oracle and instead utilizes

the provided off-chain signed oracle price.



The share price, when force-pushed, tends to be more resilient to market fluctuations compared to the Dex-based share price. However, both solutions coexist because share price force-pushing comes with its own tradeoffs:

1. **Expiration Time:** The off-chain signed share price has an expiration time, rendering it useless after a certain period.

2. **Oracle Fetching:** Force-pushing also requires fetching an oracle to propagate signed data to the Multipool when assembling a complex contract call involving Multipool operations.

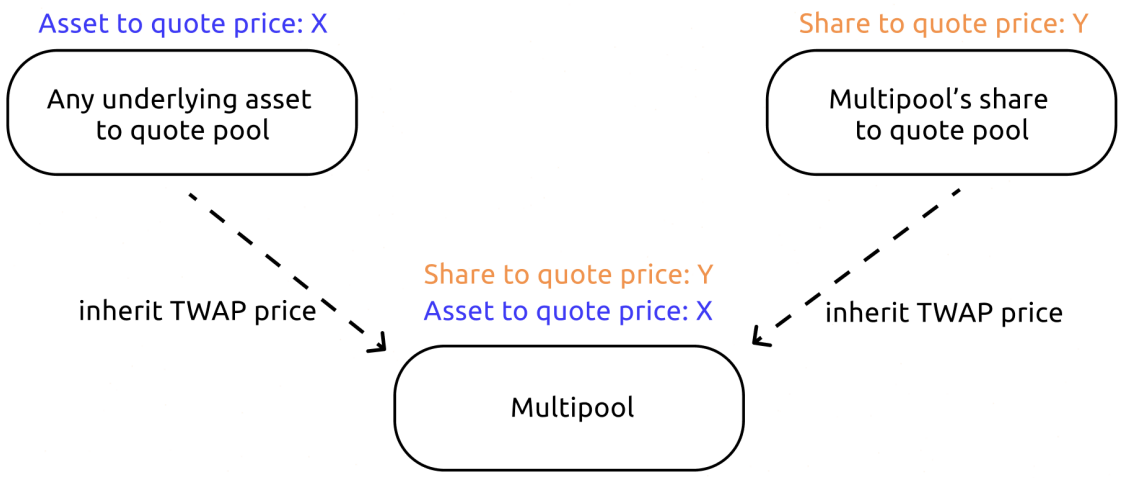
The optional use of share price force-push helps maintain the correct price and simplifies on-chain access to Multipool swaps through the more convenient on-chain Dex-based price. However, as the demand for a particular share grows, share price force-pushing serves as a solution to bring the knowledge of analytical share price on-chain. Its presence encourages users to adhere to this price even without explicit settlement.

2.3.4 Arbitraging with force push

As the force-pushing of share prices brings analytical price knowledge on-chain, it enables on-chain AAM arbitrage, particularly if there's a Dex pool with a share token.

Typically, the most effective on-chain market stabilization involves Miner Extractable Value (MEV) and arbitrage. These operations entail taking a flash loan, executing trades, and then repaying the loan, collecting profits that need to surpass transaction costs. In practice, these methods, being immediate and low-risk, play a crucial role in moving prices for synthetic assets. For instance, algorithmic stablecoins maintain their price by leveraging MEV transactions whenever the price deviates from the oracle-based value.

As illustrated below, Multipool's price force-pushing creates a price difference that allows for value to be earned in a single transaction. In this case, since the force-pushed share price is closer to Multipool's real value than the Dex price, this difference prompts the Dex price to adjust towards the analytical value.



Let's consider the scenario where there is no force push mechanic. In this situation, the potential cross-arbitrage profit between two Uniswap pairs and the Multipool itself can be expressed by the following formula:

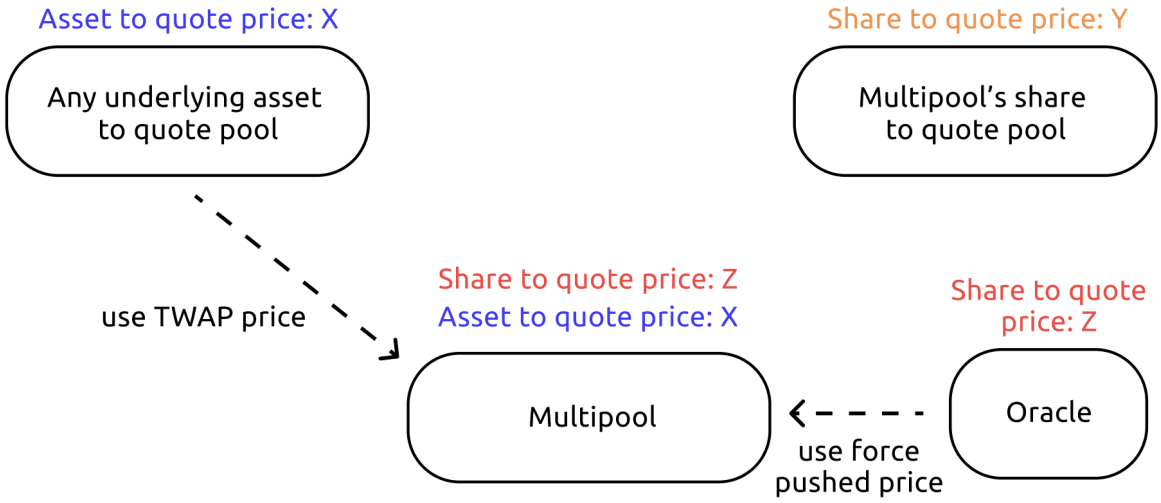
$$p = (((LoanValue * X - F_1) * \frac{Y}{X} - F_2) * \frac{1}{Y} - F_3) - LoanValue$$

Where: F_i - fees; X, Y- prices of share and any selected multipool asset; $LoanValue$ - value that is gained for arbitrage; p - arbitrage profit.

Even if we assume that all F_i values are equal to zero, the formula yields a situation where there is mathematically no profit:

$$p = LoanValue * (X * \frac{Y}{X} * \frac{1}{Y} - 1)$$

We can consider that the price X inherited from the pool to the Multipool may differ from the pool's actual price, given that X is a historical TWAP value. However, the fluctuations in X are not expected to surpass the impact of fees. Additionally, as the Multipool's TWAP value is influenced by arbitrage trades, such trades may result in impermanent value loss.



In situation with ability to force push share price, the arbitraging profit formula changes to be:

$$p = (((LoanValue * X - F_1) * \frac{Z}{X} - F_2) * \frac{1}{Y} - F_3) - LoanValue$$

Where: F_i - fees; X, Y, Z- prices of share and any selected multipool asset; $LoanValue$ - value that is gained for arbitrage; p - arbitrage profit.

If we roughly assume there is a same price of X in multipool and sum all fees into an F value, then we get next formula:

$$p = LoanValue * (\frac{Z}{Y} - 1) - F$$

In this case there is a strong cross arbitrage opportunity when $Z > Y$ or $Y > Z$. Which of two values is greater determines arbitrage direction. It is also needed for profit to overtake fees, this property depends on the modular difference of two price values.

However, force pushing of share price brings on-chain information about real current multipool share price. This results in on-chain following of this value as it is reached by having arbitraging opportunities.

2.4 Managing assets

AAM effectively manages assets by defining their target shares and allowing the market to execute trades. Changes to target shares can occur regularly or remain constant over an extended period. However, the continuous fluctuation of the system is inevitable due to the dynamic nature of target shares, which are determined by the quote value share of each asset. This fluctuation is influenced by both price and quantity variations.

Furthermore, the system allows for the maintenance of the underlying asset list, permitting the addition and removal of assets as needed.

2.4.1 Adding assets

Adding an asset to Multipool is accomplished by assigning a non-zero value to its share. Subsequently, the share values of other assets will proportionally decrease. This process can lead to a significant and permanent shortage of new assets if their target share is substantial. While this addition allows users to trade large quantities comparable to other assets until the proper deviation is reached, the deviation limit mechanic prevents the removal of a new asset through trading or burning when there is a substantial shortage.

2.4.2 Removing assets

Removing an asset from Multipool involves setting its share value to zero. Similar to the addition of assets, this creates an opportunity for substantial trades by users. However, in the case of burning and due to the deviation mechanism, the removed asset can only be taken out.

Attempting to mint or swap with the removed asset as input will exceed the deviation limit.

2.4.3 Forcing asset share updates

Another effective management strategy is to introduce additional incentives to motivate users to peg selected assets to their target share in Multipool. Cashbacks can be manually added to a specific asset, providing an extra incentive for users to align the asset's share with its target and collect the full cashback value. This feature can also be utilized to expedite the process of adding or removing assets.

2.5 AAM portfolio maintenance

2.5.1 Initial liquidity requirements

The AAM system faces a liquidity shortage, necessitating a minimum TVL for a specific Multipool to operate successfully. This is due to the fact that the amount of assets that can be utilized is typically determined by the formula:

$$value = currentAssetQuantity * deviationLimit / 2$$

There are rare scenarios where the value can exceed the deviation limit due to price fluctuations or changes in the target share (e.g., asset addition, asset removal, significant target share change). However, the system continues to operate under the following conditions:

1. **Sufficient Liquidity for Operations:** Adequate liquidity is necessary for executing operations, including MEV, arbitrage, or trading transactions. Trading volume is crucial for the maintenance of AAM, and its functionality depends on ongoing trades.

2. **Sustainable Fee Collection:** Sufficient fees must be collected to compensate the owner (if applicable) and support share price oracles. Without these essential returns, the Multipool lacks the infrastructure for successful operation.

The initial TVL for each Multipool is a unique value, influenced by:

1. **Asset Shares:** Assets with low shares are less utilizable due to their limited multiswap liquidity for the same TVL value.

2. Asset Number: Excessive asset number can result in lower shares, leading to reduced multiswap liquidity for the same TVL value.

3. Fee Parameters: All fee parameters, including the fee charged from traders to cashback ratio, play a role in determining benefits for all AAM consumers. Inappropriate parameters may result in low revenue or low volumes, insufficient to cover infrastructure fees.

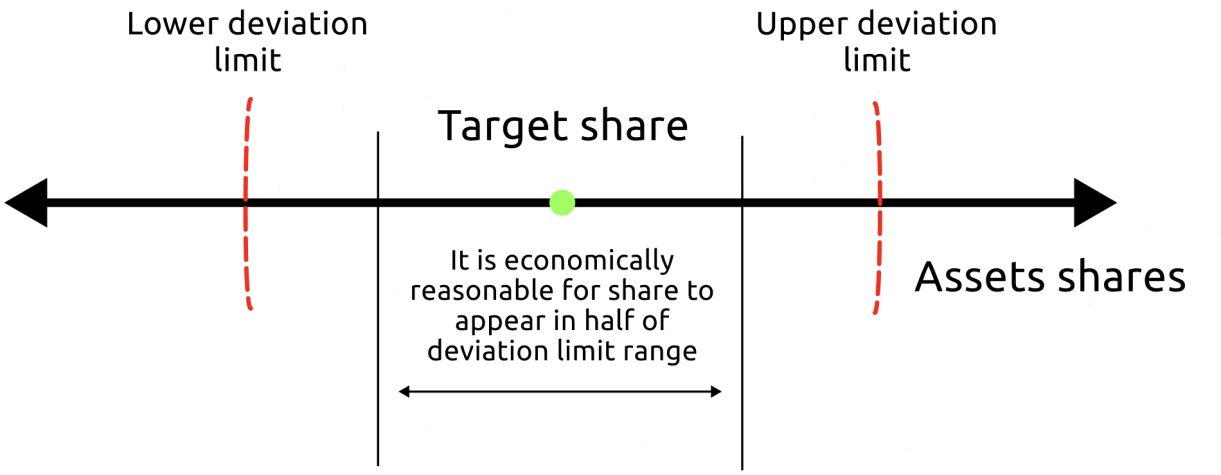
2.5.1 Shareholders economical risk

For shareholders, AAM represents a self-managing portfolio, and its primary value lies in the effectiveness of trading underlying assets. Shareholders can speculate on whether the portfolio will grow or decline. However, it's essential to note that AAM's primary utility is in aligning shares with target values, and it does not guarantee specific share price directions.

Price sources are transparent, and their accuracy and objectivity are determined by the user who owns a particular Multipool. Users who deposit value into a specific Multipool also confirm the chosen price sources. It's important to note that the objectivity of a price is only valid at the moment of a trade. While the objective price for trading is never directly available, using the last trade price or any aggregated price is sufficiently accurate for implementing a portfolio management strategy. This implies that portfolio management relies on aggregated

metrics that are considered truthful for exchanging one token for another.

The AAM mechanism has one factor that may not fully align with the chosen strategy. This factor is that the deviation limit will always permit price fluctuations within its defined range. As the portfolio's TVL increases, efficient management might necessitate a lower deviation limit.



Regardless, this phenomenon ensures that the share price is close to the target, though not precisely equivalent. Any difference can be addressed through the following rules:

1. Each operation that decreases the deviation is beneficial for the user, aligning with the goal of adhering to target shares.

2. Operations that increase the deviation are allowed due to the system's management mechanics. However, such operations come with additional fees that can be utilized to offset the deviation increase.

The owner of the AAM has the option to mitigate share price inaccuracies resulting from share fluctuations by distributing a portion of the collected deviation fees to the holders. Other portions can also be utilized as incentives for deviation reduction, such as through cashbacks.

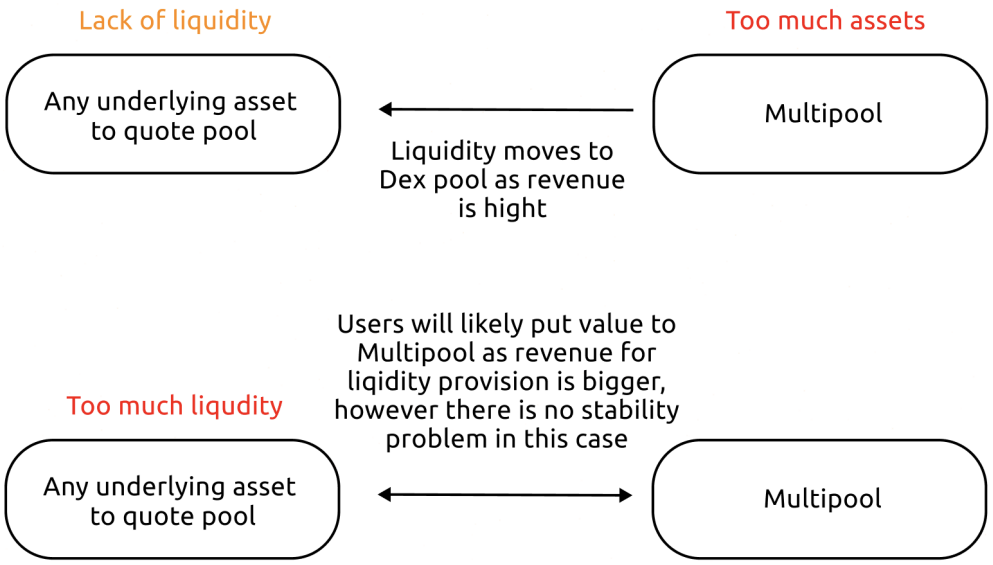
2.5.3 Liquidity hard cap and price liquidity issues

Another nuance of AAM, common to every ETF, is the existence of a maximum TVL for a particular Multipool, which is reached as it grows. Typically, this is not problematic, as the Multipool acts as a derivative, and its demand drives the demand for underlying assets, resulting in proportional growth. However, challenges may arise if there are an excessive number of assets deposited into the Multipool.

The Multipool locks quantities of underlying assets inside and exposes a limited quantity for swapping. The price of this asset is determined from a Dex that holds liquidity for this asset and is external to the Multipool. If the value of the locked asset within the Multipool is substantial compared to the asset's total supply, it may lead to low liquidity within the Dex and pose a risk of price manipulation.

The broader issue revolves around how to determine the price of an asset if the Multipool holds a significant portion of its supply. However, AAM does not directly address this situation.

Nevertheless, there are economic reasons why the lack of Dex liquidity might not be solely attributed to the Multipool.



If there are too many assets within the Multipool, arbitrage opportunities within the underlying assets can still generate profits for liquidity providers. Conversely, there might be incentives for liquidity provision into the Multipool. Proper incentives from the Multipool can ensure that there is always liquidity in both places. When liquidity grows in one location, the revenue for each liquidity-provided token decreases. Therefore, liquidity might be directed to where there is less TVL but a higher yield.

However, to prevent potential issues, Multipool liquidity incentives should not be artificially high. This ensures that there are no economic reasons to allocate the entire supply of an asset into the Multipool.

3 Use Cases

This section of the paper is designed to illustrate various common use cases of AAM in the DeFi space. While these cases primarily employ the mechanics described earlier, they demonstrate different financial approaches by implementing diverse asset management strategies and selecting various types of underlying assets.

3.1 Index based ETF

The most common use of AAM is to create a traditional market-cap-weighted index-based ETF, similar to the S&P 500. This index is managed continuously, and any share-specifying strategy can be employed. This type of Multipool may include assets regularly traded on the market, offering periodic cost-effective swapping opportunities:

No Price Impact: As the Multipool lacks a curve and uses an oracle-based price, there is no price impact.

Low Fees: Actions that peg the AAM incur only a small base fee.

Multiswap Mechanism: Addressing the current lack of gas-efficient solutions for exchanging multiple tokens.

Cashback Accumulations: The ability to earn cashback by aligning shares with target values leads to additional profits, resulting in more economical trades in specific directions.

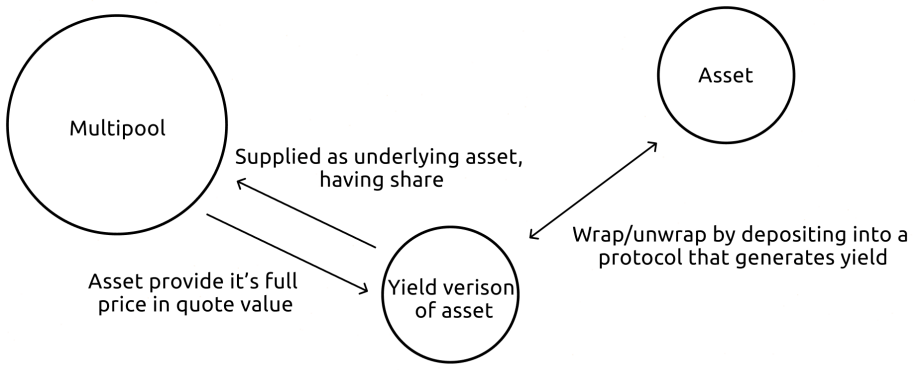
On the flip side, this type of AAM proves convenient as a permissionless tool, allowing users to create a portfolio that is automatically managed. This is advantageous in two ways:

Simplified Management: Users only need to specify shares, and other users will manage their portfolios more effectively.

Transparent Portfolios: Users can create transparent portfolios, enabling others to adhere to their strategy with a single click. Additionally, the AAM owner has the ability to charge fees.

3.2 Yield Managing ETF

Another option for using AAM is to effectively manage yield-generating tools. Essentially, all that's required is a tokenized yield-generating position to implement this approach. By having a contract that wraps an asset and generates profits, it can be added to a Multipool with a price oracle that combines the asset's price and its yield price. The process of generating yield leads to the continuous growth of the quote value for this asset, consequently increasing the price of the Multipool share.



These assets can also be effectively managed, and there are two options for this:

Cheap and Easy Asset Management:

- Wrapping and unwrapping original assets is a straightforward and cost-effective process.
- In this scenario, Multipool is economically equivalent to an index-based approach, with the only difference being that operations cost slightly more gas and bring additional capital efficiency.
- This type of yield generation can be implemented on top of lending protocols like Aave or Radiant and liquid staking derivatives such as Lido or Curve.

Complicated Asset Management:

- Examples of this approach include Uniswap LP tokens, which represent a fee-earning position.
- Opening a position and measuring the position's quote price is relatively expensive in this case.
- The costliness makes it challenging to fully utilize these assets for swapping opportunities compared to the first option.
- However, this ETF instance provides an easy way to manage shared positions, making it more cost-effective for individual users to manage liquidity and introducing new mechanics into the market-making of Dex'es.

3.3 Stablecoin ETF

AAM can serve as an effective diversification tool for stablecoins, addressing the concern of potential depegging of any individual stablecoin asset. Many users prefer spreading their funds across different stablecoins to mitigate this risk. A Stablecoin ETF can cater to users' needs by offering a convenient mechanism for one-click diversification and managing shares based on a specified stablecoin reliability index.

In the event that a particular stablecoin begins to depeg, the ETF can set a zero target share for that asset. Additional mechanisms can be introduced to efficiently sell the depegging stablecoin to the market, such as manual cashback incrementation.

Moreover, there is the possibility to transform a Stablecoin ETF into a yield-generating tool, significantly enhancing its capital efficiency.

4 Summary

The AAM represents a cutting-edge solution in the DeFi space, offering a robust and efficient mechanism for managing diverse portfolios of assets. Through its innovative features and mechanisms, AAM addresses common challenges faced by asset managers in the rapidly evolving crypto landscape.

The white paper explores various use cases for AAM in the DeFi space, such as creating market cap-weighted index-based ETFs, managing yield-generating tools, and serving as a diversification tool for stablecoins. These use cases showcase the versatility and flexibility of

AAM, catering to diverse investment strategies within the decentralized financial ecosystem.

In essence, AAM emerges as a powerful and user-friendly solution for decentralized asset management, offering transparency, security, and efficiency in navigating the complexities of the evolving DeFi landscape. As the crypto space continues to grow, AAM stands as a testament to the ongoing innovation in decentralized finance, providing users with a sophisticated yet accessible tool for managing their digital assets.