Aliquo: The Decentralized Reserve Asset Protocol

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Abstract. In this whitepaper, we present Aliquo, a decentralized protocol committed to creating a reserve asset built upon the ERC-721, which embodies a blueprint called AQ1. Our approach proposes a flywheel mechanism that makes the protocol collect the royalties over secondary sales of the NFTs to become accrued as collateralized value for the non-fungible tokens themselves. The earnings captured are allocated to a protocol reserve. In its turn, the protocol reserve is fractionalized in a number of stakes with a theoretical ratio of 1:1 between the stakes and the supply cap of the ERC-721 token, on which the token supply cap is the coefficient of the number of stakes, and each stake collateralizes 1:1 the backed floor price of each NFT.

1. Introduction

From PFPs to Generative Art, NFTs adoption has seen exponential growth during the rampant frenzy generated in 2021, bringing a massive influx of new retail interest. However, it still represents a thin layer of how deeply the fundamentals of ERC-721 tokens can be explored and leveraged.

In its turn, rather than being designed as a blockchain-based digital collectible, artifact, or artwork, *Financial NFTs* are designed to carry some underlying financial utility or application, instead of having the visual output and traits rarity as their main product. The *Financial NFTs* can include everything: from bonds and security-based swaps to baskets of tokens. From that, we introduce Aliquo: a decentralized reserve asset protocol on the Ethereum blockchain.

Through AQ1, the protocol native token, Aliquo comprises existing mechanisms widely adopted by the ERC-721 market (e.g., royalties over secondary sales, ETH as a unit of account, low and capped supply) to present a blueprint that draws a token model design composed of underlying financial features for ERC-721 tokens.

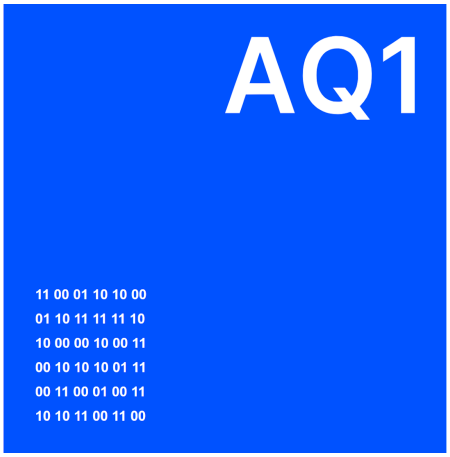
2. Aliquo Protocol

Aliquo is a decentralized protocol on the Ethereum blockchain dedicated to building an ERC-721-based reserve asset called AQ1. Aliquo aims to unfold the potential of the ERC-721 protocol as a blockchain-based infrastructure to build a financial public good.

3. AQ1

AQ1 are 1,000 ERC-721 tokens backed 1:1 by a 0,1% stake in a protocol reserve that accrues royalties earnings.

Aliquo introduces a simple flywheel mechanism that makes the protocol collect the earnings from royalties over secondary sales of AQ1, which are allocated at the AQ1 Vault to back the floor price of AQ1 itself. In its turn, AQ1 Vault collateralizes the floor price of AQ1 with a theoretical ratio of 1:1 between the vault ETH value (100%) and the supply cap of AQ1 (1,000).



Example of AQ1

3.1 Token Model

Royalties as Liquidity (RaL)

By default, AQ1 has 10% of royalties over secondary sales. 100% of the earnings captured by Aliquo are accrued in the AQ1 Vault.

Through a flywheel mechanism, Aliquo instantly adds the profit earned from royalties over secondary sales of the entire token supply of AQ1 back to the principal amount of the tokens, providing a long-term, virtuous cycle of compounding the backed floor price of AQ1.

With royalties over secondary sales serving as Aliquo's core stream to provide protocol-owned liquidity, *Royalties as Liquidity (RaL)* is the token feature that makes the entire token model design of AQ1 structurally viable, economically sustainable, and conceptually plausible.

Reserve-Backed

Each AQ1 is collateralized 1:1 by a 0,1% stake in the AQ1 Vault (100%/1,000). AQ1 Vault, the protocol reserve to which the earnings from royalties over secondary sales of AQ1 are allocated, is fractionalized with a theoretical ratio of 1:1 between the vault's assets value (100%) and the NFT supply cap (1,000).

In the end, in addition to providing intrinsic, on-chain proven value, *Reserve-Backed* provides — as a token feature — a predictable, tangible, and palpable unit of account for AQ1: 'Collateralized 1:1 with a 0,1% stake in the AQ1 Vault'.

- Note: As a protocol standard, the backed floor price of AQ1 must be always measured in ether (ETH).

Proof of Value (PoV)

Proof of Value (PoV) is the method to audit the backed floor price of AQ1. It works as a due diligence process where anyone can verify AQ1 Vault's ETH value in the root, tracking it on block explorers.

Through an on-chain verification of the AQ1 Vault, anyone can calculate and attest the 0,1% stake collateralizing 1:1 the backed floor price of AQ1.

Non-Inflationary

AQ1 is non-inflationary, having a hard cap supply of 1,000. This means after the entire token supply of AQ1 is minted, the smart contract permanently ceases the token emission. Immutable, the supply cap of AQ1 is embedded in its smart contract code, being publicly verifiable and attested by anyone.

Protocol Ensured Value (PEV)

100% of the holdings of AQ1 Vault are employed to collateralize the backed floor price of AQ1.

As a protocol standard, AQ1 must be always measured in Ether (ETH). Based on the fact that Aliquo does not sell funds from the AQ1 Vault's balance sheet and there's no new token issuance after the 1,000 AQ1 becomes minted, it's correct to assume that the backed floor price of AQ1 does not fall below its current ether value. For example, if each 0,1% stake in the AQ1 Vault backing 1:1 the floor price of AQ1 currently equals 0.03 ETH, it is guaranteed that such amount of ether is the current *Protocol Ensured Value (PEV)* of each AQ1, not falling below.

Thus, *Protocol Ensured Value (PEV)*, as a token feature, provides ERC-721 tokens the capability to maintain (retain) or increase (compound) their backed floor price.

Auto-Compound

AQ1 is an auto-compound ERC-721 token.

The core of the auto-compound interest of AQ1 occurs by increasing and leveraging the backed floor price of the NFTs themselves, automatically adding earnings from royalties over secondary sales of the protocol-native tokens to their backed floor price — with the resulting compounded backed floor price of each NFT becoming principal for the next cycle.

Distinct from traditional market strategies, on which compounding events takes place weekly or bi-weekly, the compounding of AQ1 occurs every time a secondary sale takes place, paired with the NFT trading activity, i.e., every secondary sale of AQ1 can be interpreted as a compounding event to the entire token supply.

The 10% royalty fee earned in each secondary sale of AQ1 is equally dissolved among the entire token supply.

- e.g., if 0.01 ETH becomes collected in a single secondary sale of AQ1, 0.00001 ETH becomes automatically accrued in each AQ1.

Free-Floating

AQ1 is a free-floating ERC-721 token. This means each NFT is free to trade above 0,1% of AQ1 Vault, at a *premium*.

Aliquo does not impose any upper limits on the price ceiling of AQ1. In other words, the exchange rate of AQ1 is allowed to float due to market forces without the intervention of Aliquo, and, on the other hand, always keeping a 0,1% stake in AQ1 Vault that defines the *minimum price* of each AQ1.

Governance Token

AQ1 serves as Aliquo's governance token via Aliquo DAO. The membership of the DAO is based on anyone holding at least one AQ1.

On-Chain Storage

AQ1 is fully generated and stored on-chain. No third-party servers become used to store the metadata and visual output of each AQ1 — the Ethereum blockchain is the data store.

At the time of minting each AQ1, a randomly generated string becomes engraved on each NFT visual output. Each string is unique, made of 36 binary numbers, being divided into 6 rows.

3.3 Royalties

AQ1 royalties earnings are deposited directly in the AQ1 Vault. This means the royalty recipient wallet address of AQ1 is the AQ1 Vault wallet address.

As a protocol standard, 100% of earnings from royalties over secondary sales of AQ1 becomes captured by Aliquo. The earnings are fully allocated at the AQ1 Vault.

4. Aliquo Flywheel

Aliquo introduces a flywheel mechanism that makes the protocol collect 100% of earnings from royalties over secondary sales of AQ1 to become employed to back the floor price of the NFTs themselves. This creates Aliquo's flywheel — the protocol's core mechanism.

Strategy

1. The higher trading volume of AQ1 leads to higher earnings from royalties over secondary sales;
2. The higher earnings from royalties over secondary sales lead to a higher AQ1 Vault's balance sheet;
3. The higher vault's balance sheet leads to a higher underlying value of the 0,1% stake in the vault backing the floor price of AQ1t;
4. The higher backed floor price of AQ1 leads, proportionally, higher earnings from royalties in each trade of AQ1 on the secondary market;
5. The circle is completed and repeated in a perpetual loop.

4.1 Compound Interest

Through a flywheel mechanism, Aliquo automatically adds the profit earned from royalties of the entire token supply of AQ1 to the principal amount of the 1,000 NFTs; reinvesting the entire sum to accelerate the profit-earning process of all assets equally in the next cycle of compounding. Therefore, the current original principal of each AQ1 (i.e., current backed floor price) represents the accrual of all the interest earned and added from the previous cycles of compounding.

Aliquo's flywheel provides a long-term, virtuous cycle of compounding the backed floor price of AQ1: as much more AQ1 becomes traded, more earnings from royalties the protocol accumulates as backed value to AQ1 itself. Hereupon, the key point of compounding the floor price of AQ1 is that as much more the backed floor price increases, it proportionally leverages how much 10% from royalties equals in each secondary sale of AQ1; then, reflecting on the posterior protocol revenue and the next cycle of compounding.

It's correct to assume that each secondary sale of AQ1 affects the entire token supply, meaning that the interest earned from royalties in each secondary sale is diluted among the entire token supply of AQ1 (interest earned per secondary sale/1,000), not accruing the sum earned to the traded token. In other words, one secondary sale of AQ1 earns interest on the entire token supply.

Mechanism

Aliquo's flywheel works as a structurally viable and economically sustainable mechanism that makes AQ1 accrue its liquidity as collateralized value, providing a long-term, virtuous cycle of compounding the backed floor price of the token itself.

1. When the trading volume of AQ1 increases, earnings from royalties over secondary sales increase as well;
2. When earnings from royalties over secondary sales increase, the allocation for AQ1 Vault increases as well;
3. When allocation for AQ1 Vault increases, the backed floor price of AQ1 increases as well;
4. When the backed floor price of AQ1 increases, earnings from royalties over secondary sales in each secondary sale of AQ1 proportionally increase as well.

5. Equations

AQ1 Backed Floor Price

$$AQ1_{Backed} = \frac{AQ1_{Vault}}{AQ1_{Supply}}$$

- $AQ1_Bb_{acked}$ equals $AQ1_{Vault}$ divided by $AQ1_{Supply}$, where $AQ1_{Backed}$ denotes *AQ1 Backed Floor Price*, $AQ1_{Vault}$ denotes *AQ1 Vault Assets Value*, and $AQ1_{Supply}$ denotes *AQ1 Supply Cap* (1,000).
- Note: It's aimed that *AQ1 Backed Floor Price* will be respected as the *minimum price* of AQ1 in the secondary market because token holders, being reasonably rational and self-interested agents, will always look to maximize their profits, as occurs with managing any other asset.

AQ1 Market Floor Price

$$AQ1_{Market} = \frac{AQ1_{Vault}}{AQ1_{Supply}} + AQ1_P$$

- $AQ1_{Market}$ equals $AQ1_{Vault}$ divided by $AQ1_{Supply}$ plus $AQ1_P$, where $AQ1_{Market}$ denotes *AQ1 Market Floor Price*, $AQ1_{Vault}$ denotes *AQ1 Vault Assets Value*, $AQ1_{Supply}$ denotes *AQ1 Supply Cap* (1,000), and $AQ1_P$ denotes *AQ1 Premium*.
- Note: AQ1 is free-floating. Aliquo does not impose any upper limits on the price ceiling of AQ1, meaning that AQ1 can always trade above its 0,1% stake in the AQ1 Vault, at a premium. *AQ1 Market Floor Price* is the floor price of AQ1 on marketplaces (OpenSea/Blur), which is dictated by market forces.

AQ1 Premium

$$AQ1_P = AQ1_{market} - AQ1_{backed}$$

- *AQ1 Premium* equals the additional value of *AQ1 Market Floor Price* that exceeds *AQ1 Backed Floor Price.*
- e.g., If $AQ1_{market}$ equals 0.1 ETH and $AQ1_{backed}$ equals 0.05 ETH, $AQ1_P$ equals 0.05 ETH.

6 AQ1 Tokenomics

Token Symbol	AQ1
Blockchain	Ethereum
Token Standard	ERC-721
Total Supply	1,000
Output Storage	On-Chain
Output MIME Type	SVG
Mint	1 per tx

6.1 Token Distribution

Seeking to incentives a decentralized token distribution since the protocol inception on the Mainnet, the launch of AQ1 is defined as a fair public launch, where the entire token supply of AQ1 is offered via public mint.

There is no founder or development team, VC, or early investor pre-allocation program to privately claim a portion of the total supply of AQ1 before the release for sale to the public. Everyone, from everywhere, is allowed to mint AQ1 with equal opportunity.

7. AQ1 Vault

AQ1 Vault is the protocol reserve backing the value of AQ1, being fully composed of Ether (ETH). The vault captures and accrues the earnings from royalties of AQ1.

AQ1 Vault is fractionalized in a fixed number of stakes with a theoretical ratio of 1:1 between the stakes and the supply cap of AQ1, on which the token supply cap is the coefficient of the number of stakes, and each stake collateralizes 1:1 the backed floor price of each NFT.

7.1 Vault Management

AQ1 Vault is fully autonomous, requiring no management. This means that AQ1 Vault has no external dependencies.

7.2 Protocol-Owned Liquidity (POL)

Aliquo owns 100% of the liquidity held in the AQ1 Vault.

100% of the liquidity held at the AQ1 Vault comes from royalties over secondary sales of AQ1.

8. Aliquo DAO

Aliquo DAO is the decentralized organization of AQ1 token-holders that governs Aliquo.

8.1 Governance Structure

Aliquo DAO introduces a simple structure where any DAO member can issue a governance proposal, and every DAO member can vote democratically on every decision.

Aliquo DAO is governed through off-chain voting (Snapshot).

9. Conclusion

Historically, investors tend to hedge against inflation risks by allocating capital to store of value assets that are expected to retain or increase their value.

Materializing the core utility of AQ1, Aliquo aims that the protocol-native NFT can function as a decentralized, fully ether-backed reserve asset that accrues earnings from royalties as backed value, enabling AQ1 to retain or increase its purchasing power over time, rather than depreciate; the primary fundamental of a reserve asset.