

Etamurho

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Abstract

We propose Etamurho, a decentralized game-theoretic protocol on Ethereum. As core, Etamurho introduces a tri-token economic model that explores how three fundamentally identical yet independent protocol-native tokens can coexist, correlate, and influence one another; forming a unified economic structure. Together, as a composite of “micro assets”, these three protocol-native tokens collectively constitute the Etamurho protocol as a “macro asset”. As an end result, we propose a blueprint of a novel blockchain-based economic model, introducing a foundation for future advancements in financial systems and complex on-chain economic models.

1 Introduction

As financial systems continue to evolve through digital innovation, blockchain technology is reshaping the frameworks of value creation and distribution. Decentralized economic models – particularly those operating on permissionless, programmable public blockchains such as Ethereum – are introducing a structural shift in how market coordination, price discovery, and monetary systems are designed and executed without reliance on centralized intermediaries.

In this emerging paradigm, economic primitives are no longer confined to fiat-denominated units of account or traditionally intermediated financial instruments. Instead, they are being redefined as programmable cryptographic assets, governed by transparent protocols and maintained through decentralized consensus mechanisms.

In this paper, we propose Etamurho, a decentralized game-theoretic protocol on Ethereum. Etamurho proposes a new, innovative economic model that departs from conventional monolithic asset economics. At its core, the Etamurho protocol introduces a tripartite economic model comprising three fundamentally identical, yet independently functioning, protocol-native tokens – Eta (ETA), Mu (MU), and Rho (RHO) (§ 2) – that together constitute a unified macroeconomic entity. This architecture positions the protocol itself as a composite financial object, wherein the protocol-native tokens act as “micro assets”, and their collective interactions give rise to a singular “macro asset”: the Etamurho protocol.

The foundational premise of Etamurho is defined by the concept of Triptych Asset (§ 5), an analogy derived from the tripartite structure of paintings, in which three distinct yet interrelated panels form a cohesive whole. This metaphor is translated into economic logic, wherein the protocol’s value structure is fragmented across three parallel but intrinsically interconnected

native tokens. These tokens exist in a constant state of comparative valuation, with their prices dynamically influenced by each other through mechanisms rooted in game theory and market psychology.

At the operational level, Etamurho's model is structured upon a concept termed Price Synergy (§ 3) – a construct that posits that each of the three protocol-native tokens intrinsically reflects, reinforces, and derives valuation signals from its counterparts. At any given time, one token represents a Discount (§ 3.1.3), one represents a Fair Price (§ 3.1.1), and one represents a Premium (§ 3.1.2), determined purely through market forces without reliance on external price oracles. These indicators function as both a pricing mechanism and a strategic guidance system for market participants, incentivizing continuous rebalancing behavior through arbitrage and speculative flows. This rebalancing, in turn, is aimed at contributing to the overall price stability and resilience of the protocol's macroeconomic valuation.

Etamurho's architecture rejects the need for external price oracles or centralized control points. Instead, it leverages endogenous feedback loops and decentralized participant behavior to shape economic outcomes. All tokens are launched simultaneously, with identical fundamentals, liquidity, and initial price, paired with a USD-pegged stablecoin (DAI). The synchronized launch and equal starting conditions ensure the integrity of the Price Synergy concept from inception, allowing for organic divergence and convergence in valuation over time.

Furthermore, the Etamurho protocol formalizes its macroeconomic structure through the introduction of the Etamurho Index (EI) (§ 6), a composite metric that reflects the aggregate value of the three protocol-native tokens. The Etamurho Index (EI) proposes a standardized benchmark for evaluating the performance and systemic value of the protocol. In doing so, Etamurho presents itself as not merely a collection of interlinked assets, but as a unified economic structure.

This paper seeks to articulate the theoretical framework, architectural design, and systemic implications of the Etamurho protocol. It outlines the mathematical underpinnings of the Price Synergy concept, details the mechanics of the Triptych Asset structure, and presents a rationale for positioning the protocol as a self-contained, modular, and decentralized asset primitive. Through a novel approach, Etamurho presents a foundational blueprint for next-generation blockchain-based asset primitives built on modularity and endogenous valuation mechanisms.

2 Economic Model

As core of the Etamurho protocol, we propose a novel economic model designed to explore the dynamics of inter-token valuation and intra-protocol coordination.

This model is predicated on the coexistence of three fundamentally identical yet economically independent protocol-native tokens – Eta (ETA), Mu (MU), and Rho (RHO) – each of which functions as a self-contained asset with distinct, free-floating market behavior, while simultaneously contributing to a composite macroeconomic structure. This tripartite configuration forms the basis for a new, innovative economic system grounded in game-theoretic principles, market psychology, and self-correcting feedback mechanisms.

In contrast to traditional token economics that rely on a singular native asset to mediate all functions of value accrual, the Etamurho protocol intentionally fragments these roles across three assets. By doing so, it facilitates the emergence of inter-asset dynamics such as relative pricing, perceived undervaluation, and incentive-driven rebalancing, which are naturally absent in univariate token structures.

2.1 Architecture

In sum, the core architecture of the Etamurho economic model consists of three protocol-native tokens – Eta (ETA), Mu (MU), Rho (RHO) –, where each token is launched simultaneously under identical fundamentals and economic parameters, establishing complete symmetry among the three assets at launch and providing a neutral baseline from which emergent pricing differentials are aimed at organically developing.

2.2 Functionality

The Etamurho protocol operationalizes its architecture through the interaction of ETA, MU, and RHO as individual free-floating assets that maintain no enforced peg or pricing mechanism among them.

ETA, MU, and RHO are not algorithmically stabilized, nor are they price-linked via oracles. Instead, valuation dynamics are derived solely from free market forces, participant behavior, and cross-token comparative analysis.

Despite sharing identical fundamentals (i.e., supply, initial liquidity, etc.), each token operates as a distinct unit of value. Over time, due to behavioral economics, trading patterns, and speculative tendencies, pricing disparities between the tokens are aimed to naturally emerge. These discrepancies form the basis for strategic repositioning and arbitrage behavior among market participants (§ 2.3)

This structure gives rise to two key market dynamics:

1. **Market competition:** Each token competes for perceived value dominance. When one token outperforms its counterparts, capital may flow into that asset, reinforcing momentum or triggering a valuation correction.
2. **Market cooperation:** Due to the intrinsic parity in fundamentals and protocol concept, the undervaluation of one token implicitly enhances the relative attractiveness of its peers. This fosters a scenario in which each token indirectly supports the valuation of the others through reciprocal interdependence.

2.2.1 Arbitrage-Driven Price Convergence

Given the tokens' fundamentals parity, deviations in pricing are interpreted as signals of temporary inefficiency rather than structural differentiation. These inefficiencies present arbitrage opportunities for market participants:

- For example, if Token A (e.g., ETA) is trading below Token B (MU) and Token C (RHO), market participants may view it as undervalued relative to its peers.
- Rational market participants, guided by comparative price logic, are incentivized to sell the overvalued token and accumulate the undervalued one, anticipating a reversion to mean equilibrium.

Over time, this behavior contributes to a rebalancing cycle – a key feature of the protocol’s equilibrium mechanism (§ 4.1).

This dynamic equilibrium is underpinned by the concept of Price Synergy (§ 3). Through this framework, pricing deviations among tokens are not treated as anomalies but as functional attributes of the economic model proposed by the Etamurho protocol. The model incentivizes decentralized, organic market participant behavior that is aimed at sustaining relative price convergence and encouraging distributed price discovery.

2.2.2 Microeconomic Token Dynamics and Emergent Macro Asset Formation

Each of the three protocol-native tokens – ETA, MU, and RHO – serves as a microeconomic unit with its own market forces. However, in aggregate, these tokens collectively constitute a “macro asset” – the Etamurho protocol. This “macro asset” represents the holistic economic identity of the system and is formalized through the Protocol as Asset (PaA) abstraction concept (§ 5.1).

The interdependence of the “micro assets” produces emergent economic behavior that cannot be understood in isolation. The valuation of the “macro asset” – the Etamurho protocol – relies on the collective state of its constituents (ETA, MU, and RHO).

The result is a self-referential economic system in which the protocol's integrity, value, and perceived stability emerge, fundamentally, from the interaction of its internal components rather than any external anchor.

3 Price Synergy

At the center of the Etamurho protocol’s economic framework, we propose a concept defined as Price Synergy – a dynamic valuation mechanism that delineates the relative price performance of the protocol’s three native tokens.

Price Synergy leverages the theoretical and market-driven interconnectivity among these three identically structured yet independently assets to establish a self-reinforcing and resilient valuation system.

Price Synergy is designed to promote continuous equilibrium within the protocol by enabling a system of internal price referencing, wherein each token dynamically assumes an indicator as either Discount (§ 3.1.3), Fair Price (§ 3.1.1), or Premium (§ 3.1.2). These indicators, defined purely by relative market pricing, serve as guiding values for rational behavior of market participants within the tri-token structure.

By enabling these price differentials to organically emerge and self-correct through open-market activity, the Price Synergy concept eliminates the need for external stabilization modules (e.g., oracles or algorithmic pegs), empowering decentralized, market-based price discovery.

As an end result, through the concept of Price Synergy, the Etamurho protocol transitions from being a collection of three assets into a cohesive macroeconomic construct.

3.1 Indicators

The Price Synergy's indicators identify the state of each token based on its current market price in relation to its counterparts. At any given time, each of the three tokens is assigned one of three value indicators: **Fair Price**, **Premium**, or **Discount**.

The Price Synergy's indicators are non-static and subject to change in real-time, as market activity continuously reshapes token prices and thereby reassigns indicator roles. This constant reassignment is what enables the system's dynamic equilibrium, a condition in which imbalances are perpetually corrected through rational protocol participant behavior.

3.1.1 Fair Price

The Fair Price indicator is defined as the token whose market price is intermediate between the other two. This token serves as the reference point (i.e., baseline), for assessing the relative overvaluation or undervaluation of the other two tokens. It does not imply intrinsic superiority but acts as a neutral anchor for comparative valuation.

3.1.2 Premium

The token trading at the highest market price among the three is designated as the Premium. This status implies relative overvaluation compared to the Fair Price.

3.1.3 Discount

Conversely, the token trading at the lowest market price is considered the indicator for Discount. This status signals relative undervaluation and is aimed at incentivizing capital inflows from arbitrage-seeking participants.

3.2 Rationale

Consider the following scenario:

- Eta (ETA): \$1.00
- Mu (MU): \$0.90
- Rho (RHO): \$1.10

In this scenario:

- ETA is assigned the Fair Price status, as its price is intermediate among the three.
- RHO is assigned the Premium, being priced 10% above the Fair Price.
- MU is assigned the Discount, priced 10% below the Fair Price.

The indicator roles function not as enforced designations but as emergent reflections of free-market valuations. Market participants are encouraged to use these indicators to guide portfolio allocations, arbitrage decisions, or hedging strategies.

For instance, a rational market participant might sell RHO at a Premium and acquire MU at a Discount, anticipating a convergence toward the Fair Price (§ 4).

3.3 Calculations

Discount, Fair Price, and Premium indicators value can be determined through the equations listed below.

3.3.1 Fair Price

The Fair Price is determined by the price of the token that is neither the highest nor the lowest among the three tokens (the intermediate token).

$$V_{\text{fair}} = \text{Intermediate Value of } (V_{\eta}, V_{\mu}, V_{\rho})$$

Where V_{fair} is the Fair Price, V_{η} is the price of Eta, V_{μ} is the price of Mu, and V_{ρ} is the price of Rho.

3.3.2 Premium

The Premium value is determined by the relative difference between the highest-priced token and the Fair Price.

$$P = V_{\text{high}} - V_{\text{fair}}$$

Where P is Premium value, V_{high} is the highest-priced token value, and V_{fair} is the Fair Price token value.

3.3.3 Discount

The Discount value is determined by the relative difference between the Fair Price and the lowest-priced token.

$$D = V_{\text{fair}} - V_{\text{low}}$$

Where D is the Discount value, V_{fair} is the Fair Price token value, and V_{low} is the lowest-priced token value.

4 Market Dynamics

The Etamurho protocol is designed to foster a self-regulating macroeconomic construct in which relative price performance between three fundamentally identical protocol-native tokens – ETA, MU, and RHO – serve as strategic signals for market participants.

The identification of each token's temporary market indicator as either Discount (§ 3.1.3), Fair Price (§ 3.1.1), or Premium (§ 3.1.2) generates ongoing opportunities for capital reallocation, driven by rational expectations and incentive-compatible behavior.

When a token is trading at a Premium, it is, by definition, priced above its protocol-relative equilibrium (i.e., the Fair Price). Rational actors may interpret this as an overvaluation signal and reallocate capital accordingly by selling the Premium token and relocating capital toward the Discount token, which is priced below the Fair Price indicator. This behavioral loop – facilitated by game-theoretic decision-making – forms the basis of the Etamurho protocol's rebalancing dynamics.

For instance, consider the following scenario:

- MU is trading at \$1.00 (Fair Price),
- ETA is trading at \$0.90 (Discount), and
- RHO is trading at \$1.10 (Premium).

In such a scenario, participants are incentivized to sell RHO, capture perceived gains at the Premium, and reallocate capital toward ETA, which is trading at a Discount. This repositioning strategy is not enforced by protocol rules or mechanisms but emerges from the economic logic embedded in the Etamurho protocol's model and the rational incentives it proposes.

Through this process, market forces are expected to exert corrective pressure, facilitating a convergence toward equilibrium among the three assets and promoting system-wide valuation stability without the need for centralized intervention (§ 4.2).

4.1 Rebalancing

Assuming that market participants are rational about the economic fundamentals of the Etamurho protocol, a continuous market-driven rebalancing mechanism is expected to occur – the functional materialization of Etamurho’s game-theoretic protocol design.

Such a game-theoretic rebalancing mechanism is expected to operate as a decentralized correctional process, driven entirely by market participant behavior in response to protocol-internal pricing signals.

When price disparities emerge between tokens, these imbalances trigger a chain of rational actions as participants seek to optimize their positions relative to the Discount, Fair Price, and Premium indicators.

In practice:

- Premium tokens tend to experience sell pressure,
- Discount tokens attract buy pressure, and
- Fair Price tokens serve as reference anchors for decision-making.

This dynamic interplay results in ongoing adjustments in supply-demand balances across the three assets, empowering a continuous re-equilibration process. The more participants engage in this rebalancing process, the more robust and reflexive the system becomes – mirroring the self-correcting characteristics of efficient financial markets.

Importantly, this rebalancing is not imposed through algorithmic stabilizers (§ 4.2). Instead, it arises endogenously through the distributed logic of individual actors operating under shared assumptions of value parity proposed by the Etamurho protocol. As such, the rebalancing mechanism fundamentally embodies the protocol’s principles of decentralization, non-interventionism, and market-based coordination.

$$R = \left(\frac{V_{\text{fair}}}{V_{\text{premium}}} \times P_{\text{premium}} \right) + \left(\frac{V_{\text{fair}}}{V_{\text{discount}}} \times P_{\text{discount}} \right)$$

Where R is the rebalancing mechanism, V_{fair} is the Fair Price token value, V_{premium} is the Premium token value, P_{premium} is the price of the Premium token, V_{discount} is the Discount token value, and P_{discount} is the price of the Discount token.

4.2 Oracle-Free

The Etamurho protocol is free of external price oracles as a mechanism for establishing or enforcing value correlations between the three protocol-native tokens.

Rather than enforced by externally sourced price feeds to mediate inter-token relationships, the Etamurho protocol relies exclusively on free-market dynamics, participant behavior, and market psychology to establish pricing signals and equilibrium conditions. From that, value correlations emerge organically through game theory and open market activity and are continuously refined by the aggregate rational behavior of market participants.

5 Triptych Asset



The Etamurho protocol introduces Triptych Asset as the foundational concept underpinning its economic architecture. Inspired by the compositional structure of triptych paintings – which traditionally feature three distinct panels unified into a single artistic expression – the concept of Triptych Asset analogously interprets the Etamurho protocol’s three native tokens (ETA, MU, and RHO) as independent “micro assets” that collectively constitute a single, integrated “macro asset”.

In this framework, each token operates autonomously in the open market, governed by identical economic fundamentals, yet differentiated by pricing dynamics and market behavior. While each token retains full independence in terms of valuation and trading activity, they are economically and structurally designed to exist in systemic interdependence, bound by the principles of Price Synergy (§ 3).

Thereby, the Triptych Asset concept reframes the Etamurho protocol not as a collection of unrelated tokens, but as a multi-token economic unit – a coordinated system wherein value is not determined by any one token in isolation, but rather through the mutual interaction of the three.

5.1 Protocol as Asset (PaA)

Building upon the Triptych Asset concept (§ 5), the Etamurho protocol introduces a higher-order abstraction defined as Protocol as Asset (PaA). The concept of Protocol as Asset (PaA) positions the protocol itself as a singular, composite economic entity – a “macro asset” – whose structure is composed of three identically-configured, yet independently tradable, “micro assets” – ETA, MU, and RHO.

We believe that the Protocol as Asset (PaA) abstraction present important implications:

- It enables the conceptualization of the Etamurho protocol as an investable unit, with participants able to take positions not merely in individual tokens, but in the macroeconomic state of the protocol itself (§ 8).
- It reframes protocol valuation from token-specific metrics to a system-wide valuation perspective, wherein aggregate metrics such as total capitalization, relative performance, and balance across the three assets become primary analytical tools (§ 6).

In essence, the Protocol as Asset (PaA) concept transforms the Etamurho protocol from a conventional multi-token deployment into a modular, decentralized economic structure whose macro-level valuation is derived from the continuous, synergistic interaction of its constituent “micro assets”.

6 Etamurho Index (EI)

Emerging from the Protocol as Asset (PaA) concept (§ 5.1), we propose the Etamurho Index (EI) – the Etamurho protocol’s principal macroeconomic indicator. In sum, the Etamurho Index (EI) serves as a composite valuation metric that reflects the aggregated market value of the Etamurho protocol when interpreted as a “macro asset”.

Functionally, the Etamurho Index (EI) aggregates the real-time USD market values of the protocol’s three native tokens – ETA, MU, and RHO – and expresses their sum as a single, index-based measure. This measure is designed to enable protocol participants to assess the macro-level performance and valuation of the Etamurho protocol as a “macro asset”.

Fundamentally, one unit of the Etamurho Index (EI) corresponds to the theoretical combined USD value of one unit each of ETA, MU, and RHO, at a 1:1 ratio between the USD value and index points (i.e., 1 USD equals to 1 point).

$$EI = V_{\eta} + V_{\mu} + V_{\rho}$$

Where EI is the theoretical value of 1 EI, V_{η} is value of 1 Eta, V_{μ} is the value of 1 Mu, and V_{ρ} is the value of 1 Rho.

As an end result, by enabling the evaluation of Etamurho as a unified economic construct – rather than as a disjointed set of assets –, the Etamurho Index (EI) reflects the protocol’s aggregate market value. Through a 1:1 reflection to an USD-equivalent value, market participants can rationally interpret and evaluate the performance of Etamurho as a macroeconomic structure.

6.1 Methodology

Each Etamurho Index (EI) unit is composed of a single unit of each native token:

$$EI = 1.00 \text{ ETA} + 1.00 \text{ MU} + 1.00 \text{ RHO}$$

The Etamurho Index (EI) value, at any given moment, is the sum of the current open market USD prices of the three tokens:

$$EI = \text{Price}(\text{ETA}) + \text{Price}(\text{MU}) + \text{Price}(\text{RHO})$$

This sum directly maps to the value of Etamurho Index (EI) index points.

Example

Suppose the current open market USD prices of the three tokens are as follows:

- $\text{ETA} = \$1.10$
- $\text{MU} = \$1.15$
- $\text{RHO} = \$1.20$

In this case:

$$EI = \$1.10 + \$1.15 + \$1.20 = \$3.45$$

$$EI = 3.45 \text{ points}$$

This means that one theoretical unit of the Etamurho Index (EI) – composed of one unit of each of the three tokens – is currently valued at 3.45 EI points.

Now, assume market dynamics shift, and the new token prices become:

- $ETA = \$1.20$
- $MU = \$1.15$
- $RHO = \$1.25$

The updated Etamurho Index (EI) is:

$$EI = \$1.20 + \$1.15 + \$1.25 = \$3.60$$

$$EI = 3.60 \text{ points}$$

This reflects an increase of 0.15 index points, or approximately 4.35% growth in the macroeconomic valuation of the Etamurho protocol over that period.

7 Economics

Etamurho establishes a standardized, protocol-wide economic framework that is uniformly applied across its three native tokens.

This uniformity is fundamental to preserving the integrity of the protocol's tripartite economic model, ensuring that no single token is advantaged or disadvantaged by design, and enabling the Price Synergy concept (§ 3) to function under conditions of perfect fundamentals symmetry.

By ensuring parity in token supply, initial liquidity, initial price, and initialization time window, the Etamurho protocol cryptographically creates a level economic playing field across all three tokens, fostering organic market behaviors and a fair environment for systemic valuation.

7.1 Supply and Initialization

Each protocol-native token – ETA, MU, and RHO – is deployed with an identical fixed total supply of 1,000,000 tokens.

The three tokens are launched under the following conditions:

- ETA, MU, and RHO are initialized at the same block, ensuring no temporal advantage for any individual asset.
- Each token is paired with the same USD-pegged stablecoin (DAI) and deployed into an isolated AMM liquidity pool. All three pools are initialized with equal liquidity depth and identical initial price.

We expect that this methodology guarantees the initial conditions of symmetry upon which the entire economic model of the Etamurho protocol is predicated. From a canonical origin point, price deviations and valuation dynamics between the tokens arise solely from market-driven forces, not from protocol bias.

7.2 Factory Contract

The three protocol-native tokens are instantiated using a central ERC-20 factory contract, from which ETA, MU, and RHO child smart contracts are programmatically deployed and initialized.

This seeks to ensure:

- All three tokens share an identical contract implementation, eliminating discrepancies in codebase, permissions, or token behavior.
- The factory pattern guarantees full transparency and traceability of the token creation process, ensuring that each asset is verifiably generated from the same canonical source.
- By deploying the tokens via a single on-chain factory, Etamurho eliminates the possibility of human or technical error introducing inconsistency across the token set.

8 Etamurho as SoV

The Etamurho protocol, in its entirety, is aimed at providing stability and resilience as a value-preserving monetary construct, leveraging internal economic balance and self-correcting market dynamics.

Anchored in the concepts of Price Synergy (§ 3), Triptych Asset (§ 5), and Protocol as Asset (PaA) (§ 5.1), the macro goal of the Etamurho protocol is to establish itself as a decentralized, permissionless, and algorithmically structured Store of Value (SoV) asset.

The positioning of the Etamurho protocol as a SoV asset is not derived from the individual market behavior of ETA, MU, or RHO in isolation, but rather from their systemic composition as a “macro asset”.

8.1 The SoV Strategy

An Etamurho protocol’s SoV strategy proposition emerges from market participants engaging with the protocol by distributing their investment equally across ETA, MU, and RHO.

For example, instead of investing \$300 entirely into one token (e.g., ETA), a market participant allocates \$100 each into ETA, MU, and RHO, forming a balanced position.

This tripartite allocation strategy is aimed at empowering economic advantages for the Etamurho protocol:

- **Value reinforcement:** The relative price performance of the three tokens are aimed at supporting each other through ongoing rebalancing. Premium (§ 3.1.2) and Discount (§ 3.1.3) indicators are expected to continuously incentivize corrective arbitrage, mitigating volatility at the macro level.
- **Risk distribution:** Equal exposure to all three tokens reduces reliance on the performance of any single asset and protects against isolated underperformance or market anomalies.
- **Protocol-level resilience:** As more market participants engage in equal-weighted investment strategies, the Etamurho protocol's valuation is expected to become increasingly reflexive, stable, and self-sustaining.

As an end result, through the SoV strategy, the Etamurho protocol can be economically interpreted not simply as a multi-token system, but as a unified value-preserving monetary construct.

9 Conclusion

This initial draft of the Ethamurho whitepaper is meant to establish a conceptual understanding of the high-level design and architecture of the proposed protocol. It should not be considered complete or final. The version 1.0 of this paper will be published for public review and community input on <https://github.com/elevadoxyz>.