

Quantity-Based Alternating Pricing Token (QCT)

Whitepaper

Version: 1.0

Status: Conceptual / Prototype-ready

Blockchain: Ethereum-compatible (EVM)

Token Standard: ERC-20 (Fully Fungible)

1. Abstract

This whitepaper introduces **Quantity-Based Alternating Pricing Token (QCT)**, a fungible cryptocurrency system that differentiates *users* (not tokens) based on the **quantity of tokens held**. The protocol creates a **time-based alternating economic cycle** in which purchasing power oscillates daily between small holders and large holders, while the overall economic scale grows yearly.

The core objective is to demonstrate that **economic differentiation can be achieved without breaking fungibility**, decentralization, or DEX compatibility. QCT remains a standard ERC-20 token, fully tradable on automated market makers (AMMs) such as Uniswap and PancakeSwap.

2. Problem Statement

Most crypto systems attempt differentiation by:

- Creating special tokens
- Introducing NFTs
- Assigning token IDs
- Using non-standard mechanics

These approaches often:

- Break fungibility
- Reduce liquidity
- Prevent DEX trading
- Increase system complexity

The challenge addressed by QCT is:

How can a single fungible token create differentiated economic outcomes for users without differentiating the tokens themselves?

3. Core Principle

3.1 Fungibility Preservation

All QCT tokens are identical and interchangeable. No token has:

- Identity
- Color
- Serial number
- Historical marker

Only **wallet balances** and **time** influence economic behavior.

4. Token Specification

| Parameter | Value |
|----------------|-----------------------------|
| Name | QuantityCycleToken |
| Symbol | QCT |
| Standard | ERC-20 |
| Decimals | 18 |
| Maximum Supply | 100,000,000,000 QCT |
| Minting | Fixed at deployment |
| Burning | Optional (future extension) |

The entire supply is minted at genesis to ensure predictability and transparency.

5. Holder Classification Model

5.1 Quantity-Based Differentiation

Users are classified dynamically based on their current balance:

- **Small Holder:** Holds less than 10,000,000 QCT
- **Big Holder:** Holds 10,000,000 QCT or more

This classification: - Updates automatically - Requires no registration - Cannot be manipulated without acquiring tokens

5.2 Why Quantity-Based Classification Works

- Preserves fungibility
 - Encourages accumulation or distribution
 - Reflects economic stake
 - Aligns incentives naturally
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6. Time-Based Alternation Mechanism

6.1 Daily Alternation Cycle

The protocol introduces a deterministic **daily cycle**:

| Day | Advantage |
|--------------------|---------------|
| Even-numbered days | Small holders |
| Odd-numbered days | Big holders |

On each day: - One group receives extreme purchasing power - The other group pays a premium

This creates a **continuous economic oscillation**.

7. Pricing Logic (Cake Example)

Assume a product with a reference value of **₹1000**.

7.1 Daily Pricing Rules

| Holder Type | Favored Day Price | Unfavored Day Price |
|--------------|-------------------|---------------------|
| Small Holder | ₹1 | ₹1999 |
| Big Holder | ₹1999 | ₹1 |

This enforces: - Fairness over time - No permanent advantage - Predictable cycles

8. Yearly Value Expansion

8.1 Annual Growth Formula

Every year, the reference value doubles:

$$\text{BaseValue(year)} = 1000 \times 2^{\text{year}}$$

8.2 Example Growth Table

| Year | Reference Value | Expensive Price |
|------|-----------------|-----------------|
| 1 | 1,000 | 1,999 |

| Year | Reference Value | Expensive Price |
|------|-----------------|-----------------|
| 2 | 2,000 | 3,999 |
| 3 | 4,000 | 7,999 |
| 10 | 1,024,000 | 2,047,999 |
| 100 | Extremely Large | Deterministic |

The system is mathematically infinite and can exceed 100 years without modification.

9. Economic Philosophy

9.1 Alternating Advantage Model

Unlike static systems that permanently reward whales or penalize small users, QCT ensures:

- Advantage alternates predictably
- Time becomes an equalizing factor
- Market behavior adapts dynamically

9.2 Psychological Effects

- Encourages patience
 - Reduces hoarding
 - Incentivizes timing strategies
 - Creates economic rhythm
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10. Smart Contract Design Principles

- Fully ERC-20 compliant
- No per-token state
- Deterministic logic
- Gas-efficient
- Auditable rules

The pricing logic is read-only and can be integrated into: - Marketplaces - dApps - Payment gateways - Off-chain pricing oracles

11. Security Considerations

11.1 Manipulation Resistance

- Balance-based classification requires real capital
- Time-based logic is deterministic
- No oracle dependency

11.2 Known Limitations

- Flash-loan balance manipulation possible (can be mitigated using time-weighted balances)
 - Extreme yearly growth requires careful UI handling
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12. Compatibility

| System | Compatible |
|-----------------------|------------|
| Uniswap | Yes |
| PancakeSwap | Yes |
| Wallets | Yes |
| Bridges | Yes |
| Centralized Exchanges | Yes |

Because QCT is a pure ERC-20 token.

13. Governance & Future Extensions

Potential upgrades: - DAO-controlled thresholds - Multi-tier holder classes - NFT receipt systems - Burn-to-discount mechanisms - ERC-1410 hybrid compliance

14. Ethical Considerations

The system does not: - Discriminate by identity - Permanently favor wealth - Require KYC

It differentiates only by **voluntary economic participation**.

15. Conclusion

QCT demonstrates that **economic complexity does not require token complexity**.

By combining: - Fungible tokens - Quantity-based classification - Time-based alternation

The protocol achieves a unique, fair, and extensible economic model while remaining fully compatible with existing DeFi infrastructure.

16. Disclaimer

This whitepaper is for educational and experimental purposes only and does not constitute financial advice. Implementation in production environments should undergo formal security audits.

End of Whitepaper