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Valuation Methodology for Value-utility Tokens

— An Analysis Framework Based on the Equation of Exchange

Author:

Jessica Feng, Investment Manager of Hash Global BNB Fund;

James (KK) Shen, Founder of Hash Global.

CZ (Founder of Binance):
"I'm not an expert in valuation models, but Hash Global's previous forecasts have been quite accurate. The value of a token should have many components, so if such a simple formula can capture all aspects of value, that's pretty impressive. Market prices often deviate from fundamentals — sometimes too high, sometimes too low. Binance will keep building to strengthen the fundamentals of BNB's value, and leave the pricing to experts like Hash Global."

Xinjun Liang(Co-founder of Fosun Group):
"I've worked with the Hash Global team for many years. What I appreciate about them is that while their investments may not always be perfect, their decisions are consistently grounded in rational analysis — never blind faith. They spoke to me early on about the value of the Binance ecosystem and BNB. I also participated early in their BNB staking and fund investments, and the returns have been solid. For Bitcoin and Ethereum, I've read many institutional reports, but when it comes to BNB, I believe Hash Global's analysis is the earliest and best in the industry."

Long Chen (Secretary-General of Luohan Academy, Founder of Weixi, Former Chief Strategy Officer at Ant Financial):
"While Web3 is increasingly becoming a new pillar of the financial system, there's still no consensus on how to value digital assets. Hash Global's framework, based on the quantity theory of money, offers a valuable perspective on this issue.

If a country's money supply grows in line with its economy, inflation doesn't occur — this is the well-known seigniorage effect. It shows that economic activity needs the lubricating function of money. When the velocity of money remains stable, its total value should grow in line with transaction volume.

Based on this principle, the equation of exchange offers a framework for estimating the total value of ecosystem tokens through transaction volume. While the approach relies on many assumptions, the logic is fundamentally rooted in economic fundamentals. Compared to most digital asset valuation methods, it's a clear step forward — one that's worth refining and exploring further. Thinking from the first principles of value creation is a solid starting point."

Noah Wang (Founder of Noah Wealth Management):
"As the largest wealth management platform serving global Chinese investors, Noah has always closely followed the emergence and value of new asset classes. With the regulatory frameworks for digital assets improving rapidly in the U.S., Hong Kong, and elsewhere, we see digital assets being increasingly accepted by mainstream markets. We place great importance on guiding and helping investors to learn about and understand the value of digital assets early on. Over the past two years, we've invited the Hash Global team multiple times to share their insights with our investors. Their research on 'utility tokens' has brought us many refreshing perspectives. Their attitude and methodology are worth attention and learning."

James Wei (Head of Wealth Management, KGI International):
"I've worked in wealth management for many years, helping family offices with succession planning and asset allocation. At KGI, we've seen that digital assets can improve risk-return profiles in investment portfolios, and are now guiding clients to approach them rationally and increase allocations. We are particularly interested in utility tokens with clear economic models and real-world applications. Hash Global's pioneering research in this area has been truly insightful. We've been exploring this asset class together with them and are jointly working to deepen traditional investors' understanding of these new digital assets."

1. Introduction

In recent years, the rapid development of Web3 financial infrastructure has been reshaping the rules of capital markets. Its programmability and openness are redefining sources of asset value and giving rise to entirely new asset forms. These novel assets not only carry traditional equity-like value — representing the underlying value of platforms, protocols, or ecosystems — but also possess explicit utility value, such as paying transaction fees, obtaining service discounts, or unlocking access rights. This report refers to such emerging assets collectively as "value-utility tokens" — a class of hybrid assets that combine both traditional asset-like attributes with functional utility.

The emergence of new assets is redefining the very concept of "value," and value investors' must evolve their valuation methodologies accordingly—just as the internet revolution in the early 2000s gave rise to new valuation frameworks for valuing tech stocks. As an early advocate of value-investment in crypto assets, John Pfeffer suggested: "*The first principle of value investing is independent thinking based on reliable valuation logic. When new assets first appeared, there was no corresponding valuation logic; value investors should word hard to discover new valuation logic.*"

We believe the most representative value-utility token today is BNB — the native token of Binance, the world's largest cryptocurrency exchange. BNB not only reflects the platform's underlying value but also carries real utility within the ecosystem, making it one of the earliest and most mature examples of this asset type. As early as 2017, Binance completed the tokenomics design of BNB, effectively pioneering the definition of value-utility tokens. In 2019, grounded in the first principle of value investing, we used BNB as a blueprint to propose a valuation framework based on the equation of exchange (MV = PQ), aiming to understand the value creation logic of BNB and other value-utility tokens.

Over the past six years, we have released five reports and received considerable inquiries and feedback from investors and institutions. We have continuously refined our model, which has achieved preliminary validation in the market. Below, we summarize this methodology in hopes of assisting asset managers, investors, industry researchers, and project teams with investment evaluation, asset valuation, and tokenomics design for value-utility tokens.

Web3 distributed-ledger technology has already begun—and will permanently—transform the very foundations of capital markets. A more efficient and transparent Web3 financial system is destined to become the core of future financial infrastructure. As global regulatory frameworks for crypto assets continue to improve—for example, with the recent passage of the "Digital Asset Market Structure Clarity Act," ("CLARITY Act") in the U.S., and stablecoin legislation in both the U.S. and Hong Kong—we expect to see a surge in value-utility tokens represented by BNB. Much like Tesla issuing new "shares," future capital offerings may take the form of value-utility tokens on Ethereum or BNB Chain that combine equity-like value with practical utility—such ecosystem tokens may be used to obtain discounts at charging stations. We believe value-utility tokens will become the primary asset form in the capital markets of tomorrow.

2. Definition and Characteristics of Value-utility tokens

In this report, "**value-utility tokens**" are defined as crypto assets that simultaneously possess the following two types of value foundations:

1. **Asset (Equity-Like) Attributes:** These represent the economic value of a platform, protocol, or ecosystem. Their value is generally driven by macro factors such as ecosystem size, user growth, and transaction activity, following a logic similar to corporate equity.
2. **Utility (Currency-Like) Attributes:** These serve practical functions within specific use cases, such as paying fees, gas, staking, governance, service exchanges, or platform discounts.

For this category of assets, the report adopts a valuation model based on the equation of exchange (MV = PQ), grounded in two key considerations:

First, although value-utility tokens exhibit certain equity-like characteristics, their asset attributes remain fundamentally different from traditional securities. Take BNB as an example: the token does not represent any form of equity or claim to cash flows from Binance. From the outset, Binance's founding team aligned the interests of all ecosystem participants — including shareholders, management, users, and other stakeholders — by anchoring ecosystem value growth to a single native token, BNB. This design embodies the Web3 ethos of shared ownership and community-driven development. In 2021, Binance further revised BNB's burn mechanism, shifting from a profit-linked buyback-and-burn model to an automatic burn based on on-chain activity — a move intended to decouple the token's value from the platform's financial performance and reduce regulatory risk.

In 2025, the U.S. CLARITY Act formally distinguished between "digital commodities" and "security tokens." In line with this regulatory direction, we believe future value-utility tokens will increasingly be designed to resemble digital commodities — drawing value from the underlying ecosystem, yet structured to avoid classification as "investment contracts" under the Howey Test. As such, these tokens do *not* exhibit legal characteristics of traditional equity assets, and cannot be properly evaluated using traditional cash flow–based valuation models.

On the other hand, utility tokens derive their value primarily from practical use cases within their ecosystems— such as paying fees, gas, staking, participating in governance, or gaining early access to token launches. Functionally, they operate much like circulating currency within an economic system. Their value is influenced by factors such as the scale of economic activity, frequency of usage, and supply adjustment mechanisms. Therefore, compared to traditional equity valuation models, the equation of exchange offers a more suitable approach to capturing their currency-like attributes and incorporating diverse sources of value within a unified, logical framework.

3. Model Construction

This methodology combines the **equation of exchange (MV = PQ)** with the **discounted cash-flow approach (DCF)** to form a systematic valuation framework for value-utility tokens:

> **MV = PQ**: Establishes the structural logic for how token value is generated
> +
> **DCF**: Discounts and sums the "monetary gains" from future ecosystem expansion into the token's present theoretical price

3.1 Overview of the Equation of Exchange (MV = PQ)

The equation of exchange, proposed by economist Irving Fisher, is a classical theory that explains the relationship between the money supply and economic activity. It defines:

- **M:** The total money supply
- **V:** The velocity of money (how quickly it circulates)
- **P:** The general price level
- **Q:** The total volume of transactions or real output

In traditional macroeconomics, MV represents total money demand, and PQ represents nominal economic output; in the long run, they remain in equilibrium.

We believe that for utility tokens with real use cases within on-chain ecocystem, their economic role closely resembles that of "in-ecosystem currencies." Their value is primarily driven by the expansion of the ecosystem and shifts in token supply and demand — dynamics that closely align with the logic of the equation of exchange. This model is particularly well-suited for tokens with the following characteristics:

1. Serve as the primary medium of payment within the ecosystem (e.g., fees, gas);
2. Feature transparent issuance mechanisms, with deflationary designs or lock-up mechanisms that impact effective circulating supply;
3. Derive value from the development and expansion of ecosystem activities.

3.2 Structural Modeling Based on the Equation of Exchange

Under the MV = PQ framework, the theoretical value of a token is driven by two primary pathways:

- **PQ:** The total economic value of the ecosystem
- **M × V:** The circulating supply of the token and its velocity of circulation

Any factor that impacts token value—such as user growth, transaction volume, or burn mechanisms—ultimately affects token price through its influence on either PQ or M × V.

Amont these, **V (velocity of circulation)** presents the main technical challenge in modelling. Due to the lack of directly observable data, valuation typically assumes that current market prices reflect equilibrium. Based on this assumption, **V** can be back-calculated using known values of **PQ** and **M**, with the further assumption that this velocity remains stable or changes moderately over time.

Variable	Meaning	Determinants
M	Total circulating supply of the token	Deflationary design; issuance rules; lock-up & staking; burn schedules
V	Frequency of token usage within the ecosystem	On-chain transaction behavior; share of payments; feature activity
PQ	Total economic value of the ecosystem	Total transactions/services denominated in the token within the ecosystem

Price Derivation:

Unlike fiat currencies, ecosystem tokens are typically priced in USD. Therefore, in our model, **the circulating supply (M)** can be further decomposed as follows:

$$MV = PQ \Rightarrow M_0 \cdot P^* \cdot V = PQ$$

Where:

M_0: Actual circulating supply of the token

P^*: Theoretical price of the token (in USD)

V: Velocity of the token

Rearranging the equation to get:

$$P^* = \frac{PQ}{M_0 \cdot V}$$

The theoretical price of a token is derived by dividing the total value of the ecosystem (PQ) by the product of its circulating supply and velocity. This formula serves as the foundational valuation framework of the model.

3.3 Introducing Discounted Cash Flow (DCF) for Quantitative Valuation

The quantity theory of money provides a logical framework for understanding the value creation mechanism of tokens, but it does not directly yield a price. Building on this foundation, we introduce the Discounted Cash Flow (DCF) approach. By forecasting the growth of the ecosystem's economic output and incorporating changes in token supply and velocity, we estimate the annual increase in per-token value. This projected value is then discounted and aggregated to derive a theoretical valuation. This process can also be interpreted as calculating the present value of "monetary appreciation."

The steps are as follows:

1. **Forecast Key Variables（PQ、M_0、V）**

   Based on tokenomics and business projections, forecast the ecosystem's economic scale PQ_t, actual circulating supply M_{0t} and velocity V_t year by year.

2. **Compute Annual Token Value Increment（ΔPt）**

   Annual increase in ecosystem value: $PQ_t - PQ_{t-1}$

   Corresponding increase in monetary demand: $\frac{PQ_t - PQ_{t-1}}{V_t}$

   Per-token value gain: $\Delta P_t = \frac{PQ_t - PQ_{t-1}}{M_{0t} \cdot V_t}$

3. **Discount Future Value Increments**

   Using a fixed discount rate (e.g., 10%), discount each year's ΔPt and sum them to obtain the aggregate present value, which is the token's theoretical price:

$$P^* = NPV = \sum_{t=1}^{n} \frac{\Delta P_t}{(1+r)^t}$$

r: Discount rate

NPV: Net present value of all increments

P^*: Theoretical token price

4. Valuation Case: The BNB Example

To demonstrate the practical applicability of our valuation approach, we use BNB as an example and apply our proposed **"MV = PQ plus DCF"** model for quantitative valuation analysis.

4.1 Why the Equation of Exchange Is the Best Valuation Model for BNB as a Value-Utility Token

BNB is the core value carrier of the Binance ecosystem (Binance CEX + BNB Chain) and derives its value from two primary sources:

1. **Asset (Equity-Like) Attributes:** BNB's economic model integrates traditional financial value-creation logic. Similar to how U.S. stocks enhance shareholder equity via share buybacks, BNB employs a quarterly burn mechanism that continuously reduces its circulating supply, creating long-term deflationary pressure on the supply side and providing stable price support. However, unlike traditional equity, BNB's burn mechanism is not tied to the platform's profits but is anchored in the ecosystem's supply-demand dynamics. Therefore, BNB is not a strict equity asset but possesses an equity-like attribute — using token burns to reduce actual circulating supply and establish a value mapping between BNB and the Binance ecosystem.

2. **Utility (Currency-Like) Attributes:** BNB serves multiple practical functions within both the Binance exchange and BNB Chain ecosystem, including paying transaction fees, participating in token launches on the exchange, acting as gas fees on the chain, and participating in governance. Essentially, BNB has become the "circulating currency" of the entire ecosystem. Its value depends on changes in the ecosystem's economic scale and the token's supply-demand dynamics within the ecosystem.

In summary, as the circulating currency of the ecosystem, BNB's value hinges on the supply-demand relationship (MV) and the ecosystem's economic value (PQ). Therefore, the equation of exchange appears as the optimal valuation model as it provides a comprehensive framework to capture BNB's core value drivers.

4.2 BNB Valuation Calculation

Our analysis is structured around three core steps:

> 1. Define and forecast key variables: PQ、M_0、V
> 2. Compute the annual per-token value increment: ΔPt
> 3. Discount and sum future value increments using the DCF method to arrive at the token's theoretical price.

1. Define and Forecast Key Variables: PQ, M_0, V

Ecosystem Economic Value PQ

The Binance ecosystem comprises both the Binance exchange (CEX) and BNB Chain. Therefore, PQ represents the total economic activity driven by BNB across both segments, including:

1. The portion of spot and derivatives trading fees on the Binance CEX paid using BNB (calculated as trading volume × fee rate × proportion paid in BNB, assumed to be 50%);
2. Total gas fees on BNB Chain (sum of all on-chain gas revenues).

For the calculation, the ecosystem's annual economic growth rates are assumed as follows to estimate the nominal total economic value (**PQ_t**) for each future year:

- 2025–2027: 25%, 15%, and 10% respectively;
- From 2028 onward: a long-term stable growth rate of 3%.

Circulating Supply M_0

According to Binance's whitepaper and on-chain data, BNB's initial maximum supply was 200 million tokens. After deducting the team's locked holdings (approximately 80 million) and the historical cumulative burn (around 11.65 million), the current theoretical circulating supply is estimated at roughly 108 million tokens. Based on Binance's current burn mechanism and projected future burns, the circulating supply is expected to remain at this level between 2025 and 2027, and gradually stabilize around 100 million in the long term. This represents the maximum supply available for secondary market trading, assuming no ecosystem-level usage.

From this baseline, we further deduct tokens locked in four key ecosystem use cases—transaction fee payments, validator staking, financial products, and long-term value holding—to derive the **actual circulating supply (M_{0t})**.

Velocity V

BNB's velocity is not directly observable. We use a back-solve approach: calibrate V to 0.57 using 2024's market price, PQ, and M_0. For future years, we allow ±10% variation in V and test its impact through sensitivity analysis.

2. Compute Annual Token Value Increment ΔPt

Using the formula from the previous section:

$$\Delta P_t = \frac{PQ_t - PQ_{t-1}}{M_{0t} \cdot V_t}$$

For each year, we calculate the ecosystem's incremental value and divide it by the actual circulating supply and velocity of BNB in that year to derive the theoretical annual value increment per token.

Based on actual data from 2024, assume growth rates of 25%, 15%, and 10% for the next three years, and a long-term growth rate of 3%.

Year	PQt ($b)	ΔPQ ($b)	Mt (m)	V	ΔPt (USD)
2025	14.33	14.33	39.18	0.57	645.44
2026	16.48	2.15	36.28	0.57	104.56
2027	18.12	1.65	32.93	0.57	88.30
Final	266.67	24.24	24.73	0.57	1730.38

3. Discount and Sum Future Value Increments: Calculate Theoretical Valuation

Using a 10% discount rate, discount the annual value increment ΔPt to calculate the present value of all future "monetary appreciation." The sum of all present values yields the token's theoretical price:

$$P^* = NPV = \sum_{t=1}^{n} \frac{\Delta P_t}{(1+r)^t}$$

$$P^* = NPV = 2039.58 \ \ (dollar/token)$$

4.3 Timeline of BNB Target Price Achievements Across the Four Previous Reports

	Report edition	Price at Release (USD)	Predicted Price (USD)	Target First Achieved On	Time to Achieve(days)
1st Edition	2019/4/16	19.4	106.24	2021/2/9	666
2nd Edition	2019/9/6	22.76	112.49	2021/2/9	523
3rd Edition	2021/2/9	90.51	141.72	2021/2/17	9
4th Edition	2021/3/5	229.95	655.84	2021/5/3	60
5th Edition	2025/3/28	635.90	2,039.58		

5. Conclusion

In this report, using BNB as a case study, we introduced the concept of "value-utility tokens" and established a systematic valuation framework based on the equation of exchange. We hope this framework will serve as a reference and inspiration for token-economic design by project teams, value assessment by investors, and model evaluation by researchers.

As the Web3 industry continues to evolve at a rapid pace, we will keep refining our model and updating our research findings. We welcome discussion and feedback from investment institutions, researchers, and developers on the content of this report.

For report updates, model details, or further discussion, please visit our website or contact our team. We look forward to your feedback and suggestions:

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