

L31: Token Classification and Valuation

Module D: Tokenomics

Blockchain & Cryptocurrency

December 2025

- Understand the Howey Test and securities classification
- Distinguish between utility and security tokens
- Apply valuation frameworks to crypto assets
- Analyze network value metrics (NVT, Metcalfe)
- Case Study: SEC vs. Ripple

Regulatory Implications:

- Securities require registration with SEC (in US)
- Investor protections apply
- Trading restrictions (accredited investors only)
- Disclosure requirements

Market Implications:

- Exchange listings (securities can't list on most exchanges)
- Global accessibility
- Tax treatment

Bottom Line: Misclassification can lead to enforcement actions, delisting, and legal penalties.

The Howey Test (1946)

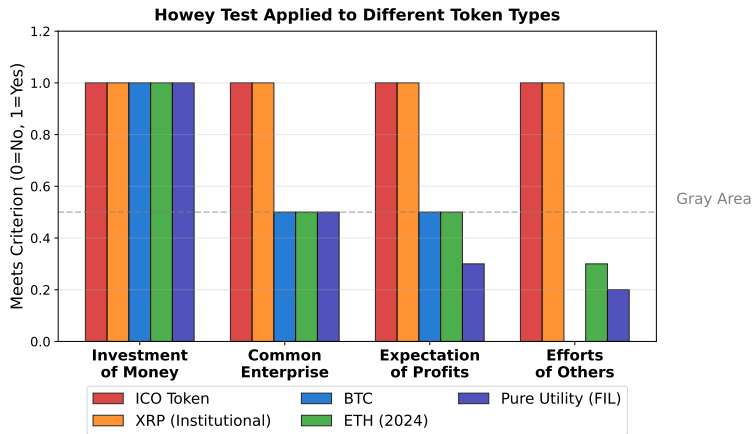
Origin: SEC v. W.J. Howey Co. (Supreme Court case)

An investment is a security if it involves:

- ① **Investment of Money** - Investors provide capital
- ② **In a Common Enterprise** - Pooled funds or shared outcome
- ③ **With Expectation of Profits** - Investors seek financial return
- ④ **Derived from Efforts of Others** - Profits depend on promoter/third party work

All four criteria must be met for classification as a security.

Howey Test Applied to Tokens



BTC and ETH largely avoid "efforts of others" due to decentralization

Utility Token

- Access to product/service
- Not marketed as investment
- Value from usage, not speculation
- Examples: BNB, FIL

Howey Test:

- Fails “efforts of others” if decentralized

Reality: Most tokens exist on a spectrum, not binary classification.

Security Token

- Investment contract
- Promise of profits
- Centralized management
- Examples: Tokenized stocks

Howey Test:

- Meets all four criteria

Background:

- Ripple Labs created XRP (2012)
- Used for cross-border payments
- Ripple holds 50% of XRP supply
- \$1.3B raised from XRP sales (2013-2020)

SEC Complaint (Dec 2020):

- XRP is an unregistered security
- Ripple raised funds through illegal securities offering

Ripple's Defense:

- XRP is a currency, not a security
- Network is decentralized (1,000+ validators)

Judge Torres Decision - Partial Victory for Ripple:

1. Institutional Sales = Securities

- XRP sold to VCs/hedge funds = securities
- Buyers had expectation of profits from Ripple's efforts

2. Programmatic Sales (Exchanges) = NOT Securities

- XRP sold on public exchanges = not securities
- Buyers didn't know they were buying from Ripple

3. Employee Compensation = NOT Securities

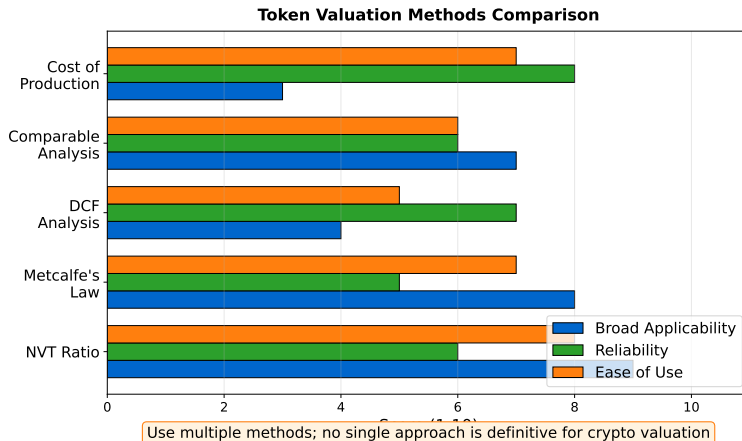
Impact: First major ruling that distinguished sale context matters.

Why Traditional Valuation is Hard:

- No cash flows (most tokens)
- No earnings or revenue
- No tangible assets
- Highly speculative markets
- Network effects hard to quantify

Approaches:

- 1 Network Value to Transactions (NVT)
- 2 Metcalfe's Law
- 3 Discounted Cash Flow (DCF) - for productive assets
- 4 Comparable Analysis
- 5 Cost of Production (mining)



NVT is most widely applicable; DCF only works for yield-generating tokens

Network Value to Transactions (NVT)

Formula:

$$\text{NVT Ratio} = \frac{\text{Market Cap}}{\text{Daily Transaction Volume}}$$

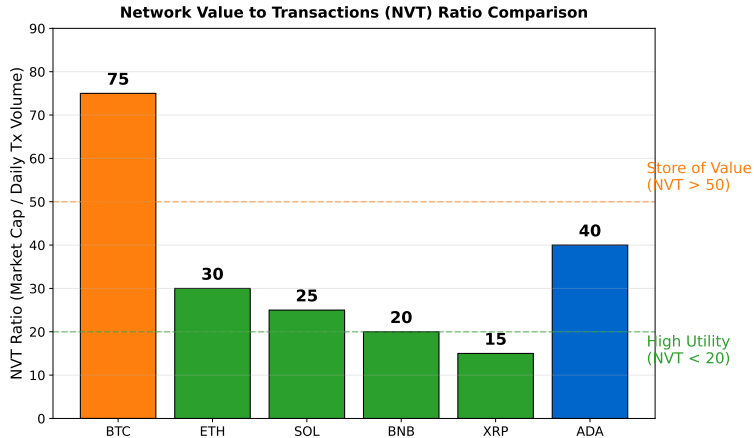
Interpretation:

- Similar to P/E ratio in stocks
- High NVT = overvalued relative to usage
- Low NVT = undervalued or high utility

Typical Ranges:

- BTC: 50-100 (higher = store of value, not payment)
- ETH: 20-40 (more transactional)
- Payment tokens: <20 (high transaction volume)

NVT Ratio Comparison



BTC's high NVT reflects store-of-value use; lower NVT indicates payment utility

Concept: Network value grows with the square of the number of users.

Formula:

$$V \propto n^2$$

where V = network value, n = number of users.

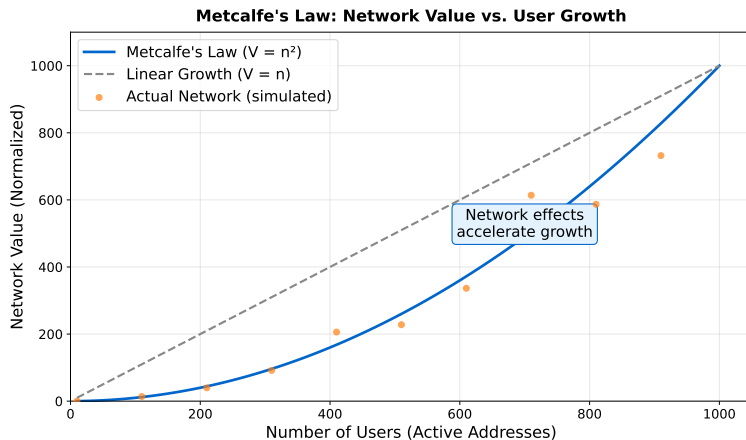
Application to Crypto:

- More users = exponentially more connections
- Active addresses proxy for n
- Studies show BTC/ETH follow Metcalfe's Law loosely

Limitations:

- Not all users create equal value
- Doesn't account for quality of usage

Metcalfe's Law Visualization



Network effects create exponential value growth as user count increases

Discounted Cash Flow (DCF)

When to Use: Tokens with cash flow generation (staking rewards, fee sharing).

Formula:

$$\text{Value} = \sum_{t=1}^n \frac{CF_t}{(1+r)^t}$$

where CF_t = cash flow in year t , r = discount rate.

Example: Staking Token

- Expected annual staking reward: \$100
- Discount rate: 10%
- Perpetual reward assumption

$$\text{Value} = \frac{100}{0.10} = \$1,000$$

Market Cap vs. Fully Diluted Valuation

Market Cap:

$$\text{Market Cap} = \text{Price} \times \text{Circulating Supply}$$

Fully Diluted Valuation (FDV):

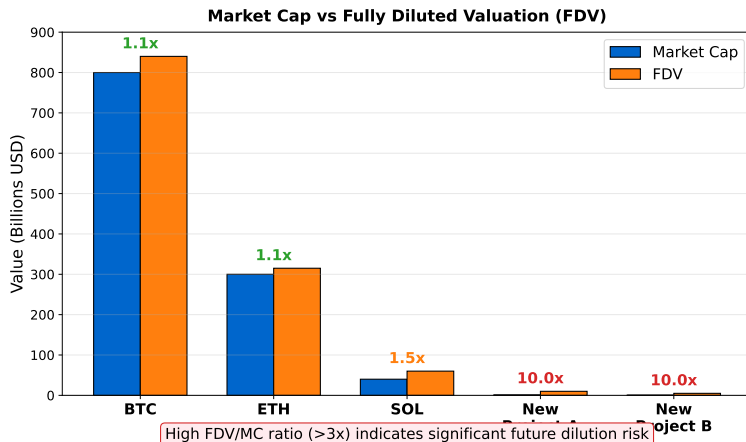
$$\text{FDV} = \text{Price} \times \text{Total Supply (Max)}$$

Example:

- Token price: \$10, Circulating: 100M, Total: 1B
- Market Cap: \$1B
- FDV: \$10B

Warning: Large FDV/MC ratio indicates future dilution risk.

Market Cap vs FDV Comparison



New projects often have 10x+ FDV/MC ratio indicating massive dilution ahead

Step-by-Step Analysis:

- 1 Determine token type and purpose (utility, governance, etc.)
- 2 Check regulatory status (security vs. non-security)
- 3 Calculate NVT ratio (compare to peers)
- 4 Analyze on-chain metrics (addresses, transactions, TVL)
- 5 Review tokenomics (supply, inflation, unlock schedule)
- 6 Compare market cap to fundamentals (revenue, usage)
- 7 Assess FDV vs. Market Cap (dilution risk)

Output: Informed estimate of fair value range (not precise number).

Key Takeaways:

- Howey Test determines security classification (4 criteria)
- Context of sale matters (Ripple case precedent)
- NVT ratio helps assess value relative to transaction volume
- Metcalfe's Law suggests network value grows with users squared
- DCF applicable only to tokens with cash flows
- Comparable analysis useful for relative valuation
- Always compare Market Cap to FDV (dilution risk)
- Crypto valuation is imprecise - use multiple methods

- 1 Apply the Howey Test to a token you're familiar with. Is it a security?
- 2 Why did the Ripple ruling distinguish between institutional and exchange sales?
- 3 Calculate the NVT ratio for Bitcoin and Ethereum. What does it tell you?
- 4 What are the limitations of using Metcalfe's Law for token valuation?
- 5 How would you value a governance token with no direct cash flows?