Nominal Pools and Utility Valuation of Blockchain Networks

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Summary: In this paper, we propose a valuation framework to prize crypto assets in smart contracts. This results in decreased reliance on oracles, reduce market fluctuations and simplified governance.

1. Motivations and Assumptions

Crypto assets remain obscure since their utility and valuation are still misunderstood. We propose a simple framework to valuate crypto assets assigning to them a "nominal price" which can be use in smart contracts to simplify estimations. First consider a crypto asset *C* with a market cap of 100M US$ that provides governance and network utility in the hypothetical blockchain network *H*. Now assume the token is being used because it provides savings over traditional digital commodities that provide value to the user.

2. Crypto Asset Valuation

Asset valuation is the process of determining the fair market value of an asset – Investopedia.

Since most crypto assets are crypto commodities, it makes sense to use a discounted asset model to value them. This model simply adds up the present market value of a basket of assets for a company or fund. Assuming no synergies or comparables, this method seems suitable to value crypto assets if we realize two conditions: tokens provide multiple utilities, and the market value of such utilities will grow towards the delta of how much additional value the token provides.

So, for any given token its value can be calculated as:

C_{value} = Present value of ($Utility_1$ + $Utility_2$ + ... + $Utility_n$), where the token *C* has *n* utilities. Now consider the value of each utility as the savings provided by the token while conducting tasks the user is interested in:

C_{value} = Present value of (Banking Price of $Task_1$ - Cost $Task_1$ in *C* + … + (Banking Price of Task $_{n-1}$ - Cost Task $_{n-1}$ in *C*)), note we only count *n-1* tasks since we cannot assign a comparable value to governance activities. Simplifying:

C_{value} = Present value of (SavingsDuetoUtility$_1$ + SavingsDuetoUtility $_2$ + ... + SavingsDuetoUtility $_{n-1}$). We name raw account of value the “nominal value” of crypto network *C*. From here on, we proceed to create some common terminology:

- A token is overvalued when its price exceeds its nominal valuation
- A token is undervalued when its price is below its nominal valuation
- A blockchain network is undervalued when its market cap is significantly lower than the value of circulating tokens valued at a nominal price
  and, finally
- A blockchain network is overvalued when its market cap is significantly higher than the value of circulating tokens valued at a nominal price.

3. Network Valuation Comparisons

Taking a token *P* price, $P = C_{value}$ /Token Circulation. Here *P* is the nominal price of the *C* token. Now we set up a pool of a million tokens, for example, and price them each at P dollars. Now consider a second crypto network D. By Sedrakyan's lemma:

$$\frac{\left(\sum_{i=1}^{n} u_i\right)^2}{\sum_{i=1}^{n} v_i} \leq \sum_{i=1}^{n} \frac{u_i^2}{v_i}$$

, where *u* refers to the series of utilities in crypto network$_1$, and *v* refers to the series of utilities in crypto network$_2$. If follows that, we can use nominal pricing and pools to establish price comparisons across crypto networks, estimate their relative worth and also assess whether they are underpriced or overpriced.

4. Nominal Pools and Their Utility

Using the cited limit, nominal pools of C tokens versus BTC, dollars and other cryptos can be set up and priced instantly. Users can be notified whether tokens are under or overpriced according to the framework and the value of the pool can be assessed vis-à-vis other crypto network valuations.

5. Example 1: A simple BTC valuation

Consider that around 188 million people have a wallet with some bitcoin. Assume they make an average of 30 transfers per month at an average cost of 0.05 cents per transfer, providing savings of 20 cents per transaction. Also assume that around, 10% of these users are making overseas transfers and saving 24 dollars with each transaction. Then,

BTC-C_{value} = 188 million * (0.20 + 0.1*24) = 82.72 million in monthly utility. Now consider an average lifespan of 80 years, then to total utility provided by the network is:

BTC-TotalC_{value} = 82.72 million *12 * 50 = About 50 billion dollars, assuming an average bitcoin holder age of 30 years. Notice this accounts for a hypothetical digital cash utility value of the Bitcoin network, not as a store of value instrument.

6. Conclusions

While providing a steep underpricing of crypto-assets, comparable utility valuations can help establish the order of magnitude of a crypto network value and allow for comparisons with other networks. Nominal pools and utility valuations can respectively provide dynamically priced pools that do not rely on oracles and also floor values of a crypto asset based on its comparable utilities across use cases and audiences.

7. Further Work Required

Further work is required to assess attrition, present sample use case utility valuations and highlight the versatility provided by comparing the utility of competing or complimentary crypto networks.