Setheum Integrated Money Market Protocol White Paper

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ABSTRACT

In this paper, I will elaborate the economic model of the Setheum Integrated Money Market Protocol - SettInDEX (Setheum Built-In DEX) on the Setheum Network. After going through this white paper, one should understand the economic model and technicalities behind the SettIndex Money Market, from the what happens pre-trade to Liquidity Pools and Trading Returns. This will be an efficient paper to the point.

PRE-TRADE

To start trading, traders and liquidity providers make deposits in USD stable-coins, and jUSD tokens of equivalent value will be issued and deposited into the liquidity pools by the SettIndex protocol.

After receiving w USD stablecoins at time t, SettIndex protocol invests a proportion $d_t w$ of the deposit into chosen cryptocurrency lending platforms (e.g. Compound) to generate additional return from the external money market, while holding the rest $(1-d_t)w$ as cash reserve for liquidity, where

$$d \in (0, 100\%) \ \forall t$$

This is because not all investment made into the cryptocurrency lending platforms can be cashed out immediately at all times, depending on the ***Total Supply(TS)*** and ***Total Borrow (TB)*** on the platforms prior to the deposit $d_t w$ that

$$\in_t = \frac{(TS_t + d_t w) - TB_t}{TS_t + d_t w}$$

Thus, for every 1 USD stablecoin deposit received, SettIndex protocol makes sure s unit of the USD stablecoins can be withdrawn at all times with full liquidity, i.e. maintaining minimum liquidity levels $\in$ (0, 100%) of for all deposits we receive from liquidity providers and traders, that

$$s = \in_t d_t + (1 - d_t) \ \forall t$$

That

$$d_t = \frac{(1 - s)\, TS_t}{TB_t - (1 - s)\, w}$$

for all

$$w \le \frac{TB_t - (1 - s)\, TS_t}{1 - s}$$

Once there are two or more deposits invested into the lending platforms, rebalance (with adjustment k_t if needed) is performed each time a new deposit (or withdrawal, i.e.$w < 0$) is made, to make sure the minimum liquidity level is maintained.

Before making the n_{th} deposit into the lending platforms at time t , we compute the amount to be deposited (including rebalance adjustment k) to satisfy the condition that the sum of the current balance of our USD stablecoins investment that can be withdrawn with full liquidity, total USD stablecoins kept in hands, the full liquidity part of new n_{th} deposit, and the remaining funds from w^n to be kept in hand, is equal to the total funds we have received from liquidity providers and traders and those we have earned from investments multiplied by the minimum liquidity level s .

For

$$w^n = \sum_{i=1}^{n} w^i \quad and \quad D^i = d^i w^i$$

Where D_t^i grows in USD stablecoins as receiving returns from lending platforms

Solve

$$\in_t^n \sum_{i=1}^{n-1} (D_t^i + k_t^i) + \sum_{i=1}^{n-1} [(1-d^i)\, w^i - k^i] + \in_t^n (D^n + k_t^n) + [(1-d_t^n)\, w^n - k_t^n]$$

$$= s\,[w^n + \sum_{i=1}^{n-1} (D_t^i + k_t^i) - \sum_{i=1}^{n-1} (d^i\, w^i)]$$

where

$$\in_t^n = \frac{(TS_t + D^n + k_t^n) - TB_t}{TS_t + D^n + k_t^n}$$

for k_t^n , where $k^i = 0$ and any $k_t^i > 0$ also grows in USD stablecoins as receiving returns from lending platforms.

- If $k_t^n = 0$, no additional adjustment will be performed and only $d^n\, w^n$ will be invested into the lending platform.
- If $k_t^n > 0$, an additional deposit of k_t^{n+1} on top of $d^n\, w^n$ will be invested into the lending platform.

In realization of the model, since we have direct access to our current balance in the leading platforms Θ, total returns of USD stablecoins earned in the leading platforms so far Λ, total fund held in hand Ω that we do not have to calculate all terms cumulatively, that we instead solve the simplified condition

$$\in_t^n \Theta_t^{n-1} + \Omega^{n-1} + \in_t^n \Delta\Theta^t + \Delta\Omega_t = s(W^n + \Lambda_t^{n-1})$$

where,

$$\Theta_t^{n-1} = \sum_{i=1}^{n-1} (D_t^i + k_t^i)$$

$$\Omega^{n-1} = \sum_{i=1}^{n-1} [(1 - d^i)\ w^i - k^i]$$

$$\Lambda^{n-1} = \sum_{i=1}^{n-1} (D_t^i + k_t^i) - \sum_{i=1}^{n-1} d^i\, w^i$$

$$\in_t^n = TS_t + \Delta\Theta_t - T\Theta_t\ TS_t + \Delta\Theta_t \ and\ \Delta\Omega_t = w^n - \Delta B_t$$

that the amount to deposit at t

$$\Delta B_t = \frac{TS_t\,[s(W^n + R_t^{n-1}) - C^{n-1} - w^n] - (TS_t - TB_t)\,B_t^{n-1}}{B_t^{n-1} - TB_t - s(W^n + R_t^{n-1}) + C^{n-1} - w^n}$$

RETURN OF jCNY

If a trader wants to purchase jCNY tokens, they need to deposit the required amount of SETT stablecoins first. After *i*SETT tokens of equivalent value are issued and deposited into the liquidity pool by the protocols, jCNY tokens will be minted according to the exchange rate and transferred to the trader. Now the trader may use the jCNY tokens to his will, that he can either keep them in his wallet, spend them as a medium of payment, sell them in external exchanges, or he can choose to deposit the jCNY tokens back to the protocol to earn return.