RULES-BASED BENCHMARK

subINDEX Methodology

Version 1.0 — 2026-09-29

$$I_t = I_{t-1} \times \Sigma_i \, w_i \times (P_{i,t} / P_{i,ref})$$

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1 OBJECTIVE

subINDEX is a rules-based benchmark that tracks the market-capitalization-weighted performance of the twenty largest alpha assets issued by Bittensor subnets. It answers one question: how is the broad subnet-alpha market doing, in TAO terms, as a single number.

Base value: **1,000.00 at inception (2026-09-29).**

2 UNIVERSE AND ELIGIBILITY

- The universe is every subnet returned by the chain's subnet registry, **excluding netuid 0 (root)**. Root issues no subnet alpha and is excluded by construction.
- A subnet is eligible for a given print only if it can be priced (see §4). Unpriced subnets are excluded from that print. They are never assigned a zero, a stale value, or an estimate.

3 DATA SOURCES

All inputs are read directly from the Bittensor chain. There is no API key, no aggregator, and no off-chain price feed.

- Chain endpoint: `wss://lite.chain.opentensor.ai:443`, via Bittensor SDK v11.1.0.
- Per subnet *i*: `SubnetTAO[i]` (pool TAO) and `SubnetAlphaIn[i]` (pool alpha), converted from rao.
- Staked alpha: the sum over the subnet's metagraph neurons of each neuron's `alpha_stake`. If the metagraph query fails for a subnet, staked alpha is recorded as 0 for that print (a conservative understatement of supply — see §13, limitation 2).
- Access is strictly **read-only**. The process never creates wallets and never submits extrinsics.

4 PRICE

> $$P_i = (\text{pool TAO})_i / (\text{pool alpha})_i$$, in TAO per alpha.

This is the subnet AMM pool's ratio price. If pool alpha ≤ 0, or either storage query fails, the subnet is unpriced and excluded from the print.

5 SUPPLY

> $$S_i = (\text{pool alpha})_i + (\text{staked alpha})_i$$

Circulating-plus-staked alpha: the pool's alpha inventory plus all alpha staked to the subnet's neurons.

6 MARKET CAPITALIZATION

> $M_i = P_i \times S_i$, denominated in TAO.

Selection and weighting are computed in TAO terms. The index is therefore a **TAO-denominated** benchmark: it measures alpha performance relative to TAO, not to USD.

7 SELECTION

Subnets are ranked by M_i descending. The top 20 form the constituent set ($N = 20$).

8 WEIGHTING AND CAPPING

> Raw weight: $w_i = M_i / \Sigma_{j=1..20} M_j$.

Single-constituent cap $c = 15\%$, applied by iterative redistribution:

1. Set every $w_i > c$ to c.
2. Redistribute the total excess pro-rata across constituents with $w_i < c$, proportional to their current weights.
3. Repeat until no weight exceeds c (at most 100 iterations).
4. Renormalize so the weights sum to exactly 1.

Status at inception: the largest constituent (SN51, 14.67%) sits below the cap — the cap is currently non-binding.

9 INDEX CALCULATION

Notation: I_t = index level at print t; $P_{i,t}$ = price of constituent i; w_i = weights fixed between rebalances; $P_{i,ref}$ = reference prices.

Daily print (no rebalance):

$$I_t = I_{t-1} \times \Sigma_i \, w_i \times (P_{i,t} / P_{i,ref})$$

After each print, reference prices are refreshed to $P_{i,t}$. If a constituent cannot be priced at print t, it is dropped and the surviving weights are renormalized (the basket sum divided by the surviving weight sum) — the index tracks the investable remainder without inventing a price.

Monthly rebalance (first print of each calendar month):

1. Re-run selection (§7) and weighting (§8) on current prices.
2. The day's return is measured on the **pre-rebalance basket** (same formula as a daily print). The new basket then takes effect with reference prices set to current prices.
3. **Chain-linking:** the rebalance itself never moves the level. Dropped names are realized at market; new names enter at market. There is no artificial jump in either direction.

Inception: I_0 = 1,000.00 on 2026-09-29.

10 PUBLICATION

One print per day, published with timestamp (UTC), level (2 decimals), day-change versus the previous print, and the full constituent table (netuid, alpha price, alpha market cap, weight).

11 MAINTENANCE AND EDGE CASES

- **New subnets** enter only via monthly selection. There is no fast-entry rule.
- **Deregistered / vanished subnets** are dropped at the next print with renormalization (§9).
- **Unpriced subnets** (pool anomaly, query failure) are excluded for that print. No stale or zero-fill.
- **Chain halt or RPC failure:** if no subnet can be priced, or the basket collapses entirely, the print aborts and the published page is left untouched. A missing print is never backfilled with invented data.
- **Labels:** constituents are identified by canonical bare labels `SN{netuid}`. No curated names are published — a wrong name is worse than none.

12 WORKED EXAMPLE — INCEPTION PRINT, 2026-09-29 17:43 UTC

129 subnets queried; 128 priced; top 20 selected. Total top-20 market cap: **2,854,332.57 TAO**. Index level: **1,000.00** (base).

CONSTITUENT	ALPHA PRICE (TAO)	ALPHA MCAP (TAO)	WEIGHT
SN51	0.094595	418,712.57	14.67%
SN64	0.070872	401,884.45	14.07%
SN4	0.053261	288,884.55	10.12%
SN120	0.046565	178,254.10	6.25%
SN53	0.033485	175,874.31	6.16%
SN44	0.033693	175,327.87	6.14%
SN3	0.028970	148,667.56	5.21%
SN8	0.028859	146,843.48	5.15%
SN9	0.025379	119,390.53	4.18%
SN68	0.020945	101,776.70	3.57%
SN28	0.021144	95,208.83	3.34%
SN95	0.037769	92,388.75	3.24%
SN75	0.016852	79,365.75	2.78%
SN56	0.015328	78,771.89	2.76%
SN93	0.018552	73,316.39	2.57%
SN34	0.011856	60,876.02	2.13%
SN107	0.043178	60,809.85	2.12%
SN62	0.010488	54,836.97	1.92%
SN5	0.012878	54,322.59	1.90%
SN17	0.008877	48,819.41	1.71%

Verification: weights sum to 100% (99.99% pre-rounding); maximum weight 14.67% < 15% cap, so the cap is non-binding at inception.

13 LIMITATIONS

1. **Single RPC endpoint** — no fallback provider; an endpoint outage pauses prints.
2. **Staked alpha falls back to 0** on metagraph failure, understating that subnet's supply and market cap for the print (affects selection and weights at the margin).
3. **Pool-ratio price** is the AMM's ratio, not a traded market price; thin or imbalanced pools can print skewed ratios.
4. **TAO-denominated** — the index does not measure USD performance.
5. **Daily snapshot cadence** — intraday moves are not captured.
6. **No backtest** — the index begins at inception; no historical levels are estimated or reconstructed.

14 GOVERNANCE

This document is the index methodology. Changes are versioned; any change to the universe, pricing, selection, weighting, capping, rebalancing, or base value requires a new version and is disclosed. The calculation code implements this document — where they differ, the document governs and the code is fixed.

15 V2 NOTE

A tokenized form of the index (one token tracking the level, with mint/redeem mechanics) is in design. **No contract exists; nothing is live.** This document describes the V1 tracked index only.

16 DISCLAIMER

subINDEX is an independent tracker. It is not affiliated with the Bittensor Foundation or the Opentensor Foundation. Nothing in this document or on the index page is investment advice.

A APPENDIX A — FORMULA SUMMARY

$$P_i = (\text{pool TAO})_i / (\text{pool alpha})_i$$

$$S_i = (\text{pool alpha})_i + (\text{staked alpha})_i$$

$$M_i = P_i \times S_i$$

$w_i = M_i / \Sigma M$, capped at 15% with iterative redistribution

$$I_t = I_{t-1} \times \Sigma_i \, w_i \times (P_{i,t} / P_{i,\text{ref}})$$

B APPENDIX B — VERSION HISTORY

- **v1.0 — 2026-09-29:** Initial methodology. Rebalance specified as chain-linked on the pre-rebalance basket (no artificial jumps).