



Bundle

**The Decentralized Asset
Management Protocol**

1 Preface

The emergence and substantial growth of DEFI (Decentralized Finance) over recent years has led to the introduction of complex protocols and often orthogonal protocols. Despite this, investors have incentives to obtain knowledge of and interact with said protocols in order to maximize returns; this has proven difficult due to fragmentation of knowledge within the space, network fees, and lack of tooling around diversification. While the concept of a financial index has been applied numerous times in DEFI, the traditional definition and application of this concept has failed to benefit from new innovation within the space; it is limited by the concept of holding a fixed set of non-motive assets.

Given the inherent complexity of new protocols arising on various networks, an ample market opportunity presents itself to allow investors to passively utilize these protocols in a risk-averse manner. As mentioned previously, attempts have been made to tackle this problem, though they have fallen short in various regards. Most predominantly, these protocols fail to capitalize on the diverse earning potential present within the space by failing to offer proper utility on invested assets. Furthermore, network fees and slippage have made rebalancing a significant area of concern, with many large projects opting for a standard AMM-as-index model (Balancer) exposing investor funds to divergence loss (impermanent loss).

Bundle aims to solve this problem by introducing the concept of a *Smart Index*, an index backed by a dynamic set of underlying assets and governed by well-defined deterministic operations aimed to maximize investor returns and utility.

2 The Smart Index

The *Smart Index* is congruent to a standard ETF; however, in order to construct an index standard that integrates well with the complexity of DEFI, a new revised definition must be made. A smart index will be defined as a financial instrument that achieves the following:

1. Does not have centralized governance or a fund manager
2. Allows underlying assets to be added or removed from the index
3. Allows for fractional and transferable ownership of an instrument backed by the underlying assets
4. Provides similar returns to holding the underlying assets and manually executing index strategies
5. Enables full mobility of underlying assets, including multi-strategy allocation of individual assets

2.1 Rebalancing

Rebalancing is a well-understood and crucial risk management strategy, aiming to ensure that a portfolio remains sufficiently diversified through standard price movements. Existing solutions, however, have typically struggled to solve this problem by either compromising for centralization (delegating control to a fund manager) or by exposing allocation to impermanent loss through an unconstrained AMM-as-index model. Impermanent losses are a very real concern in an emerging market such as decentralized finance; protocols are often immature and rapidly developing leading to significant, often uncorrelated price movements.

Bundle aims to utilize recent advancements within the space tackling impermanent loss, while making use of various assumptions around the underlying assets of an index and expectations from investors to significantly reduce the risk of IL while ensuring dynamic rebalancing.

39 2.1.1 AMM-as-index

40 Bundle will adapt upon the AMM-as-index model by utilizing Balancer's multivariate weighted liquidity
41 providing mechanisms to enable continuous rebalancing while significantly reducing arbitrage risks. The
42 standard formula can be found below.

$$43 V = \prod_t B_t^{W_t}$$

44 Where t is a value ranging from $1, \dots, n$ representing each asset in the index, V is a constant, B_t is the
45 balance of token t , and W_t is the weight on token t .

46 2.1.2 Oracle-Adjusted Dynamic Weights

47 A historically invariant assumption about financial indices is that holders are investing in a batch of assets,
48 desiring returns in some stable currency. We can use this assumption to incorporate oracle-adjusted
49 weights, ensuring that portfolio weights are adjusted such that underlying assets cannot be arbitrated
50 before gradually returning to desired weights.

51 This system would be limited and ineffective if internal swaps were always enabled; arbitrageurs could
52 react quicker than price oracles and temporary price spikes could still cause rebalancing issues. Given
53 funds will be interacting with various protocols, rebalancing needs to be limited in order to both avoid
54 network fees from unlocking funds and ensure rebalancing occurs when it is needed (not from temporary
55 market movements).

56 As such, while internal swaps will still allow for arbitrage opportunities, the above model should limit these
57 opportunities heavily, especially if internal swaps are limited. The system will be implemented as follows:

- 58 1. Assume the price of some subset of underlying assets has changed such that the new price would
59 adjust the distribution of assets past some acceptability threshold.
- 60 2. On the above condition (assume an acceptability threshold of $a = 0.02$, ensuring that an existing
61 weight W_t cannot be adjusted unless the updated weight W'_t causes the following condition to be
62 true: $|W_t - W'_t|/W_t > a$. If this holds, the existing weight would be queued for update.
- 63 3. The condition must then hold for a predetermined number of blocks, before being accepted.
- 64 4. Once a weight change is accepted, internal swaps will be opened albeit limited such that each swap
65 shifts the existing updated weight towards the original weight by a constrained amount. At this point,
66 the protocol can then control arbitrage earnings by dynamically controlling swap fees.

67 The above effectively constrains and controls arbitrage opportunities by ensuring that the index's weights
68 change dynamically (removing arbitrage opportunity) and then gradually presenting small arbitrage oppor-
69 tunity to return the index to the desired asset ratios.

70 2.1.3 Rebalancing Overrides

71 The condition may present itself where an asset rises or falls very rapidly relative to others. In this scenario,
72 arbitrage opportunities may still be damaging to participants; as such, governance will allow index holders
73 to step in during swap lock periods and sell assets directly to a DEX in order to rebalance. This would
74 ensure the capability for index participants to lock in profits from rapid price movements, rebalancing in
75 a way that does not expose arbitrage opportunities during more significant market events. While not
76 intended as a primary rebalancing mechanism, such a feature would be an important secondary system
77 or failsafe for the protocol.

78 **2.1.4 Bundle Token Insurance**

79 While planned as much later stage utility on the Bundle protocol, token insurance should be provided to
80 add new earning opportunities for governance token holders while mitigating residual risk to the protocol.
81 Specifically, this would require Bundle token holders to stake their native governance tokens to cover
82 rebalancing arbitrage losses in exchange for a portion of protocol fees, with token rewards distributed to
83 insurers to further incentivize their interaction.

84 **2.2 Strategies**

85 Strategies will be implemented and deployed through individual smart contracts, following a standardized
86 interface. These will then need to be whitelisted by the index in order to execute, with a single function
87 enabling automated compounding across each strategy by weight. In order to incentivize external ac-
88 tors to compound index earnings, a fee on re-invested earnings will be taken, dictated by a strategy's
89 configuration.

90 Each asset will map to an array containing strategy weights, allowing one asset to be exposed to many
91 protocols. This would, for instance, enable a diversified stablecoin lending portfolio, or farming portfolios.

92 Given an indexing protocol alone provides only potential value, it's important to highlight a set of strategies
93 aiming to be deployed upon initial launch. The value proposition of Bundle is in the performance of indices
94 and the minimization of both work and risk; as such, we will proceed to identify a set of intended indices and
95 their underlying strategies. While the landscape of said strategies will always be evolving and will likely
96 change shape as the protocol is further developed, this should clarify value generated by the platform
97 relative to existing mechanisms.

98 **2.2.1 Smart Lending Index**

99 The intention of such an index would be to provide a portfolio of assets engaged in single-sided staking and
100 lending such that the risk profile of the portfolio is minimized, while maximizing returns. Initial asset weights
101 will be set such that they are deemed low-risk, with strategies evenly distributed. Each rebalancing period
102 would take into account earnings from various strategies, algorithmically adjusting strategy allocations as
103 a function of time-averaged returns and the underlying asset's volatility relative to the rest of the portfolio.

104 **2.2.2 Smart Farming Index**

105 A farming index would aim to minimize pair variance while maximizing returns. Such a portfolio would
106 inherently take on more risk due to the nature of liquidity providing under AMM models, though would
107 take a similar approach to the above. Again, time-averaged returns and pair variance would be used to
108 dynamically adjust position allocations.

109 **2.2.3 Market Sector Indices**

110 A simpler, yet still theoretically effective approach would be to capture non-motive assets in an index as
111 well. Such indices should expose diversification across market sectors, while ensuring proper periodic
112 rebalancing. These indices could be made more effective than existing solutions (which seek to allocate
113 assets evenly according to market capitalization) by employing Markowitz portfolio optimization to ensure
114 an optimal allocation along the efficient frontier of a given portfolio.

2.3 Issuance and Redemption

Issuance and redemption of a smart index will be relatively intuitive, following a standard and well-adopted approach applied to the N-asset scenario.

The issuance and redemption equations are equivalent, but separated for clarity:

$$asset_{1,in} = \frac{I}{I_{total}} * asset_{1,total}, \dots, asset_{N,in} = \frac{I}{I_{total}} * asset_{N,total}$$

$$asset_{1,out} = \frac{I}{I_{total}} * asset_{1,total}, \dots, asset_{N,out} = \frac{I}{I_{total}} * asset_{N,total}$$

Note that, due to the above, single asset addition will require funds to be converted to match target weights of underlying assets.

3 The Bundle Protocol

3.1 Governance

Bundle will begin with centralized governance in order to reduce friction on product and platform development. Permissions will include the following, with any contract and protocol changes being protected behind a timelock contract:

1. Contract upgrades
2. Index initialization
3. Index configuration changes
4. Strategy whitelisting and creation

Governance will be gradually introduced by forking Compound's current implementation, Govenor Bravo. This decision was made as the system is ultimately sufficient for all purposes of governance on Bundle and has been thoroughly audited.

Voting power will be represented through Bundle's platform token, as is typical of most on-chain governance mechanisms. The intent here is for any index creation, configuration changes, and upgrades to eventually go through governance by platform stakeholders.

3.2 Platform Fees

3.2.1 Streaming Fee

Each index will be subject to a platform-configured streaming fee. This fee will accumulate based on the market capitalization of underlying assets in a given index. The initial streaming fee will be set to 2%, subject to change through governance.

3.2.2 Exit Fee

Exit fees will be initially set to 0.5%. Half of these fees will be returned to the index, with the other half being taken as platform fees.

146 3.2.3 Work Fees

147 Work fees will also accrue whenever strategy earnings are collected; this aims to both incentivize external
148 actors and cover network fees associated with strategy execution.

149 Note that all above fees and their underlying distributions are subject to change by governance.

150 3.3 Liquidity Incentives

151 Given item three in the prior definition of a smart index, it becomes clear that liquidity must be provided
152 and a price maintained for index assets. Liquidity providing for index assets will be incentivized through
153 the minting of Bundle governance tokens as a reward.

154 An index asset should maintain a price close to that of the underlying assets; were this not the case, an
155 ample arbitrage opportunity would present itself between minting and selling or buying and redeeming.

156 By the above two mechanisms, index assets should maintain a price similar to that of underlying assets,
157 while having sufficient liquidity provided on decentralized exchanges.

158 3.4 Bundle Token

159 The Bundle protocol will revolve around a central governance token, used to implement various utilities
160 within the platform. Currently planned utility is as follows:

- 161 1. Voting power for on-chain governance
- 162 2. Insurance staking for token and protocol rewards
- 163 3. The capacity to earn platform fees via token ownership, distributing work, exit and streaming fees to
164 stakeholders.

165 4 Platform Vision

166 Bundle's mission is to enable financial freedom by providing an abstracted and risk mitigated interface into
167 the complexity of DEFI. While Bundle aims to initially launch a product suite enabling passive investors to
168 take full advantage of the DEFI ecosystem, we also plan to explore more diverse and innovative classes of
169 group-governed funds; these could include, for instance, funds with automated trading strategies or even
170 venture funds offering a more collaborative and less-risky funding approach relative to traditional ICO's.

171 References

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