DELFI: SECONDARY MARKET DESIGN FOR ENHANCING VALIDATOR LIQUIDITY AND REDUCING EXCHANGE RISK

A PREPRINT

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July 31, 2024

ABSTRACT

The current whitepaper presents a novel secondary market design aimed at addressing the exchange risk and liquidity challenges faced by validators within the Eigenlayer ecosystem and potentially similar protocols. Validators who prefer to hold assets in Ethereum (ETH) are exposed to significant exchange rate risks due to the long-term lock-in period of their stakes. Such allocation of risk is inefficient because of the lack of effective risk-sharing mechanisms within the current ecosystem, which adversely affects pricing and adoption of re-staking services. This proposal seeks to mitigate the existing inefficiency of risk sharing by creating a secondary market for forward contracts, thereby enhancing the scalability of protocols like Eigenlayer and Babylon. The paper discusses the problem statement, the proposed solution, and its implications for Total Value Locked (TVL) improvement.

Keywords Exchange Risk · Forward Market

1 Introduction

Operators (validators) in blockchain protocols such as Eigenlayer play a crucial role in network security and consensus. They perform several economically important functions, which are bundled together under the prevalent design. These include (1) Provision of security services through re-staking, (2) Price discovery for the pre-ICO AVS tokens, and (3) Warehousing exchange-rate risk associated with payments in native AVS tokens.

We start with an observation that bundling of these services is inefficient, which is likely to distort the pricing of re-staking services and ultimately reduce the adoption and the scale of use of re-staking services. Operators are naturally positioned to perform the first of these functions. We propose a solution under which the other two functions could be separated to be performed by the beset-suited providers, thus increasing the overall efficiency of the system and reducing the cost of re-staking services.

2 The economic framework: misplaced risks and a missing market

Re-staking under the Eigenlayer protocol involves misplaced risks. Eigenlayer stakers receive compensation from each AVS to which they help provide security services. In return, they receive compensation in the form of AVS-native

tokens or, before the ICO, in the form of points (IOUs), which are claims on future issues of tokens. This flow of payments is supposed to compensate Eigenlayer operators for extra costs involved in re-staking activities.

Eigenlayer stakers face several distinct sources of risk or uncertainty: (1) Slashing risk associated with individual AVSs, (2) Valuation uncertainty arising from not knowing the true market value of pre-ICO AVS points, and (3) Exchange rate risk associated with the mismatch between the payment tokens and the native tokens used by the Eigenlayer stakers. The first of these, the slashing risk, is intrinsic to the core mechanism of the re-staking process and has been extensively discussed.

From the perspective of an Eigenlayer operator, uncertainty about the fair value of AVS points generates two kinds of informational frictions, adverse selection and the winner's curse, both of which have to be reflected in the cost of re-staking services. Among all the system participants, the Eigenlayer operator is not in the best position to judge the fair market value of AVS points. One natural concern is that AVS operators are better informed about the value of their own points – for instance, because they are more closely familiar with their system or because they are able to make governance decisions that affect the future value of AVS tokens. When the better-informed AVS is eager to offer payments for re-staking services in its native tokens, an Eigenlayer operator must consider the possibility that these tokens are overvalued under the terms of the re-staking contract. This is known as adverse selection.

Another dimension of information asymmetry is along the dimension of potential providers of re-staking services. If some operators are willing to provide re-staking services to a particular AVS and others decide not to participate, the concern is that the operators staying away from a particular AVS may have relatively negative information about the fair value of the AVS's payments. Thus, the terms of the participating operators, their winning bid, is too generous – this is known as the winner's curse. Our goal is to address both of these informational frictions and to reduce the resulting costs to the Eigenlayer ecosystem.

Next, consider the third source of risk outlined above, the exchange rate risk. Under the terms of the AVS protocol, the Eigenlayer base tokens (let's call them E-Tokens) are locked up for a period of time. While the staker knows the amount of fees they are earning in AVS tokens, they are not able to convert these fee payments into E-Tokens for a specified period of time. Even if the AVS tokens are traded in the secondary market and have a well-established current market value, this value would fluctuate during the lock-up period. Eigenlayer re-stakers are not the natural holders of such exchange-rate risk: they may not be as well diversified or as deep-pocketed as other market participants. Also, importantly, they did not choose to have a long exposure to the AVS token price – they are only exposed as a by-product of their validation activities. In equilibrium, the exchange rate risk borne by the operators must be reflected in the terms of their agreements with the AVSs, raising the cost of validation services and ultimately lowering the demand from the AVSs.

The economic costs of exchange-rate volatility are particularly high for long-term contracts since exchange rate volatility accumulates with the length of the lock-up period. For long-term contracts, the misplaced exchange-rate risk may induce operators to demand a high enough premium over the fair market value of the AVS's payments to make long-term contracts economically infeasible.

It is our belief that the current system is missing the secondary market for future payments in AVS points or tokens. Such a market would help the Eigenlayer operators determine the fair market value of such payments in E-Tokens and eliminate or at least reduce their exposure to exchange-rate volatility.

3 The Proposed Solution

To address the challenges outlined in the previous section, we propose to create a secondary forward market for future AVS payments. In each transaction, a validator would commit to delivering its future fee payments in AVS points (or tokens) in exchange for a fixed, known future payment in E-Tokens.

To avoid defaults, forward contracts must be collateralized on both sides. From the perspective of the buyer of AVS points, capital requirements are no more stringent than those for performing transactions in the spot market: by locking up the fixed payment amount in E-Tokens specified by the forward contract, the buyer can commit not to default at the expiration of the contract if market conditions become disadvantageous to them, i.e., if they perceive the market value of the AVS points to be lower than the initially agreed-upon payment under the forward contract.

Typically, the more challenging side of the contract is the short side since the seller of the volatile AVS points or tokens (the validator) faces a potentially unbounded downside in the event of a sharp rise in the value of such points. What is unique about this particular context is that validators already have an illiquid stake committed as collateral in support of their validation activities. The same stake could be used to efficiently collateralize the forward contract, minimizing or even eliminating additional collateral requirements.

As a numerical example, consider a validator with a single contract with an AVS, locking up their current and future fees for a period of 3 months. Suppose that the fee level is such that, in units of E-Tokens, cumulative fees over a 3-month period are equivalent to 2% of the staked amount of E-Tokens (the terms of the forward contracts provide a mechanism for converting fee payments into an equivalent amount in the base token). By committing their staked E-Tokens as collateral for the forward contract, the validator is collateralizing their forward obligation with a 50 to 1 ratio. The price of the AVS points or tokens would need to rise by more than 4,900% over a 3-month period for the validator to find a default profitable. Under typical levels of AVS token volatility, this would be only a remote possibility, which would have a minimal effect on the terms of the forward price (one-sided default risk by the validator would be reflected in the terms of the forward contract, with higher default risk resulting in a lower forward price).

3.1 Economic Benefits of the Forward Market for AVS Fees

The forward market for AVS fees would serve multiple purposes and generate efficiency gains through several related mechanisms:

- Mitigate the exchange rate risk: Validators can offload their exchange rate risk to investors interested in acquiring the tokens at a future date. This allows validators to secure a fixed exchange rate, reducing their financial uncertainty. Thus, the forward market effectively works as market for insurance against AVS price volatility.

  Such forward transactions lead to overall net efficiency gains for the system because, unlike the Eigenlayer operators, the counterparties in the forward transactions choose to take on some exchange rate risk, and therefore they should be better positioned to absorb the exchange rate risk. There are two fundamental reasons for this. First, investors in the forward market benefit from diversification: while each staker may not invest in all available AVSs, their counterparties in the forward market are free to form the most diversified portfolios. Of course, risk diversification has its limits. Ultimately, the other side of the forward market will end up being short E-Tokens and long a diversified but still risky portfolio of AVS tokens. The mechanism for the second source of efficiency gains, is that the total exchange rate risk off-loaded by the stakers through the secondary market can be allocated in small portions across a broad investor base, which helps make this risk better diversifiable to these investors. This is analogous to how public insurers can handle highly correlated risks – while they cannot diversify risks across their policies, their shareholders are able to diversify across other

types of businesses, effectively eliminating the incremental risk exposure due to the firm-specific business risk of the insurance company.

- Facilitate Price Discovery: By attracting a broad base of potential investors, the forward market takes on the burden of finding the fair value of AVS Tokens from the Eigenlayer operators.

  Deep financial markets are highly informationally efficient valuation machines, essential for allocation of resources and financial contracting across a broad range of economic activities. Rather than wrestling with the AVS valuation problem as a part of the initial negotiation, with the help of the forward market we propose, Eigenlayer operators would be able to harness the wisdom of crowds (forward market investors) to reduce or eliminate uncertainty about the fair value of payments they stand to collect. This should help improve the quality of capital allocation by Eigenlayer operators by helping them compare the true value of payments from different AVSs in their portfolios of staking contracts.

  Some of the market participants must invest in information acquisition to be able to formulate their demand schedules for individual forward contracts. This is a well-understood economic problem. To induce information production, these market participants need to be able to extract some benefits. One source of such benefits could come from their size: large counterparties may be able to obtain better forward prices under the auction format used by the forward market (see below), thus splitting the economic efficiency gains with the stakers. In a more competitive environment, information producers can still benefit if the market attracts less informed speculators. A steady supply of forward contracts by the Eigenlayer stakers should help sustain a deep and liquid forward market.

  As another potential benefit, the secondary market could provide frequent updates on the exchange rate between AVS points and E-Tokens, and the security of such an oracle could be supported by Eigenlayer validators.

- Attract Spot Market Buyers as Natural Counterparties: Those already purchasing tokens in the spot market could find forward contracts appealing, as they offer similar risk exposure with potentially better pricing and leverage options.

  For the buyer of future AVS fee payments in the forward market, the forward contract provides an exposure that is economically equivalent to a long position in AVS points or tokens combined with a short position in E-Tokens. This is equivalent to a spot-market purchase of the AVS points or tokens, potentially with the use of leverage, depending on the collateralization requirements of the contract, which we discuss below.

- Enable Broader Participation in Early-stage Projects: Through the secondary forward market, investors can access early-stage pre-ICO projects, bypassing the usual barriers to entry and effectively reducing the project's cost of capital.

  From the point of view of the Eigenlayer ecosystem, investor demand through the secondary forward market should encourage operator participation in smaller or less established projects by eliminating the associated valuation uncertainty and exchange rate risk.

- Enhance the TVL of Protocols like Eigenlayer: a well-functioning secondary forward market would address exchange rate concerns and reduce the illiquidity of payments in pre-ICO AVS points. From the perspective of the validators, such a market would reduce the costs and risks of participation. This should help attract more validators and increase the overall staked value. Some of the benefits would accrue to the AVSs in the form of lower payments for security they obtain from the Eigenlayer operators. By benefiting both AVSs and the validators, the secondary market would encourage participation on both sides of the platform, thus creating a positive feedback loop, and ultimately enhancing the TVL of the protocol.

3.2 Forward market implementation

We propose implementing the forward market as a regular sequence of one-sided auctions. As an example, a Dutch auction protocol would be suitable: this protocol operates essentially as a dynamic limit-order book, where limit orders of the sellers are periodically adjusted down according to a pre-specified rule until they are met by the buy order or reach the seller's reservation price. This auction format is more economical than the traditional limit-order book design in the blockchain environment because it does not require the sellers to adjust their reservation prices multiple times, thus avoiding excessive gas fees.

Running the forward market as a regular sequence of auctions rather than a continuous limit-order book market or an OTC market based on bilateral matching has advantages. Relative to these alternative designs, periodic auctions concentrate liquidity on a small number of regular, scheduled events, which should help make this market more liquid.

We should note that one common source of illiquidity in markets is adverse selection: buyers would be weary of taking the other side of forward contracts if they thought that Eigenlayer stakes have superior information about the value of various AVSs and are selling selectively. The fact that re-staking activity is publicly observable and forward sales of AVS fees occur at predictable dates should help alleviate concerns about selective selling, because potential buyers can observe that stakers are selling forward contracts on fees from a stable and broad basket of AVSs.

Another consideration is that market liquidity is at least partly self-fulfilling: market participants are more willing to transact today if they believe that the market will be liquid in the future. In other words, liquidity begets liquidity. A steady predictable supply of contracts on AVS tokens from the stakers is one ingredient in the recipe for a deep market. **Another important element would be to allow buyers of forward contracts to sell them prior to contract maturity. For this, forward buyers must be able to participate as sellers in the same auctions as Eigenlayer operators. It is essential that they should be able to use their existing long positions in forward contracts to secure their short positions in new contracts. In other words, buyers can effectively sell their forward positions prior to maturity by opening the offsetting short positions.**