Elision Network:

Decentralized Parimutuel Prediction Markets

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v1.0
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Betting is a history of individuals chancing their knowledge for profit by wagering on outcomes of events. Before centralized bookmaking, people mostly bet against one another in parimutuel schemes. The odds were linked to the eventual pot sizes, and losers would proportionally pay out winners. The operation of these prediction markets required a ledger, access to event information, and routing of funds- everything the blockchain decentralized. Ethereum's Whitepaper repeatedly mentioned prediction markets, with the first ICOs specifically for this mainstream use case. Unfortunately, their choice to use the 0.0-1.0 token mechanism may have exposed them to then-unknown complexities around its reliance on counterparties(liquidity). As the blockchain evolved into AMM-dominated liquidity, it created a preference for tokens that would not change in value. To solve this, Elision uses the original parimutuel trading design that does not require counterparties. A decentralized incentivization structure enables market creation, provisioning, and Oracle resolution - providing the infrastructural foundation for anybody interested in creating a prediction market project. Ultimately, builders on the Elision Network do not need to worry about the under-the-hood complexities; instead, they can focus on their PMF and attracting users to their markets.

v1.0 Foreword

This whitepaper describes a network that allows parimutuel prediction markets to function in a decentralized way. Anybody can create their own markets and participate in their operations.

The network is designed around rational, profit-motivated actors. Security is enforced through levers that influence the costs&benefits of an attack- keeping the cost of an attack higher than that of the benefit.

It is assumed that the reader has intermediate knowledge of game theory (Bonds, fees, burns, slashes) and prediction market trading mechanisms.

All feedback is welcome. Join the [Discord](). Let's make this work.

Jump to:
[Trading Mechanism]()
[Game Theory]()

Prediction Markets

We all have interests and curiosities that could give us an edge in predicting certain events, but how can we turn this knowledge into profit? Enter prediction markets.

Think of prediction markets as games of trivia given to multiple players- the questions distill into discrete answers, and funds are routed from winners to losers.

It flows then that if you know more -or perhaps something that isn't being considered- you can easily profit.

Any event that has a verifiable future outcome that is not yet known can be constructed as a prediction market, with the participants buying and selling shares in the outcome of that event. The profit return of the shares reflects the crowdfunded probability estimate of the event occuring, as determined by the sizes of the pots.

Decentralized Prediction Markets

Decentralized prediction markets have several advantages over traditional prediction markets.

First, they are much more efficient in terms of information gathering. Since anyone can participate in the market, it is easier to get a large and diverse sample of opinions. This means that the market is more likely to produce an accurate prediction.

Second, decentralized prediction markets are less subject to manipulation. Since anybody can create a market and take on any decentralized role, there is no central authority in control. This makes it more difficult for individuals or groups to artificially manipulate the price of shares.

Finally, decentralized prediction markets can be used to predict a wider variety of events. They are not limited to financial markets but can be used to predict anything from the weather to the winner of a sporting event or a political race.

Decentralized prediction markets have the potential to revolutionize the way we crowdfund. Scientific efforts can be funded by financing "Discovery bounties", projects can be rewarded for reaching market caps, or insurance can be provided against black-swan events.

Types of Prediction Markets

Prediction markets on the Elision Network can be categorized by the types of events and their outcomes:

Convergent

The first designation has to do with the timing over which an outcome is determined.

A ***convergent market*** is one where the event outcome is not decided instantaneously. In other words, there is a period of time where the market probability is driven by non-speculative factors and converges to a result.

For example, a market following a sporting event is 'convergent' during the duration of the sports game itself. This means that as the game nears its conclusion, more information is revealed, and the probability of the market will decay to 99%-1% in favor of the winning team.

Why then would anybody place bets early, if they can be guaranteed a win just by waiting? This "informational advantage" has several important implications that will be discussed later in the article.

Most markets (Financial, sports, politics) are convergent and thus require a trading lock for the duration of their market events. While locked, special derivatives can still allow a different type of trading to continue during this period; with Elision being the first decentralized implementation of such a concept.

Non-Convergent

An example of a **non-convergent market** is a coin toss. There is no trickle of information that hints at the direction of resolution, instead, the outcome is determined instantly. Most chance and casino games fall under this category, as well as some cultural markets (Oscars, Golden Globes, etc) that rely on an instantaneous reveal.

Informational advantage does not exist in this category as there is no new information available for traders who place last-minute wagers. No trading lock is required for these markets, although one can still exist for derivatives speculation.

Objective

The second designation has to do with the kind of outcome that is being wagered on, specifically whether it can be independently backtested. This determines if an oracle can be used, and consequently if the market is allowed.

An objective market is one where the event outcome is based on something happening or not. The result can be verified retroactively because it is based on an event that is written into history.

For example, a market following a sports game is considered *objective* because anybody can go back and check the result. This way there is no ambiguity in the outcome as long as it's consistent with how it is measured and defined.

Although objective markets are relatively straightforward to conceptualize, special attention must be paid to ensure the wording of a market is exact in its resolution source. Since improper configuration leads to an invalid outcome, it's important to have an effective method of ensuring validity.

Subjective

Subjective markets wager on predicting 'public sentiment' regarding a topic or outcome. Since there is no event that can be independently verified, the resolution of these markets becomes complex and reliant on distributed consensus.

An example could be a market for "Is the weather nice today?" The resolution of a market like this would rely on aggregating varying valid opinions for either direction, the measurements of which would quickly be accused of unreliability.

Further, the wagering within a subjective market could be more reflective of an attempt to game the oracle- to predict what the resolution will be, rather than what the actual truth is.

Due to these factors, subjective markets are not supported by the Elision protocol. Extreme caution is advised for any traders looking to participate in off-shoots.

Important Concepts

Prediction markets are a unique trading mechanism that requires an understanding of some basic concepts regarding how their value is derived and how it can be carried over to a decentralized implementation.

Parimutuel

Elision's trading mechanism is parimutuel.

In parimutuel betting, all traders contribute to a "Prize Pool" which is then proportionally distributed to winners. The losers pay out the winners. The organizing entity does not set odds nor take on any financial risk, they merely facilitate the transfer of funds and provide operational utility. A commission is typically charged to cover the costs of operations.

This structure translates well to the blockchain. A smart contract's forced algorithm removes the necessity for a centralized entity to transfer funds, theoretically allowing a trustless way to bet on event outcomes.

Indeed, prediction markets are an obvious mainstream implementation of blockchain- with the earliest ICOs famously setting crowdfunding records.

Elision network is specifically designed with learnings from previous projects to create a sturdy foundation focused on enabling 3rd parties to launch their own prediction market brands.

Informational Advantage

One of the well-known pitfalls of parimutuel betting is the lack of a reason to place early wagers. Since most markets are *convergent* and have a period of time where information is being revealed that directly impacts the chance of winning, traders who wait until the very last moment have an unfair advantage.

For example, consider a market that asks whether the price per barrel of oil will be >$100 3 months from now:

Traders that place a wager today take on the additional risks of unexpected events and price movements compared to a trader that places their wager a day before resolution- **all for the same reward.**

This is a fundamental problem that results in a lack of trading volume but can be influenced in the following way:

1. **Minimize the advantage of trading late**

2. **Maximize the advantage of trading early**

Early Incentive

Incentivizing placing early trades is important to create liquidity within markets and build a pool of rewards.

Legacy solutions struggle to accomplish this with complex price curves, while **blockchain presents unique solutions to this problem**.

Intrinsic/Extrinsic Value

Yield farming and incentivization structures are commonly employed within the DEFI ecosystem to promote liquidity and reward investors for supporting projects they believe in. These concept transfer over to promote early trading incentivization in the following ways:

1. Incremental rewards

2. Options-like derivative that allows early exit and profit-taking

Passive Yield

Elision prediction markets provide staking rewards based on the total value locked (TVL) within markets. These are remitted upon expiration to both winners and losers, providing a familiar liquidity staking experience for crypto traders while mitigating losses incurred from unsuccessful wagers.

Additionally, they are the mechanism to incentivize early market participation. The yield rate is scaled based on factors favorable to the ecosystem. Maximum rewards are given to the traders who placed early wagers on the underdog line.

The yield rewards vest weekly and are distributed to all open markets. The participants within each pool are eligible for a portion of this remittance based on their time of entry, wager odds, and wager amount.

Trading Mechanism
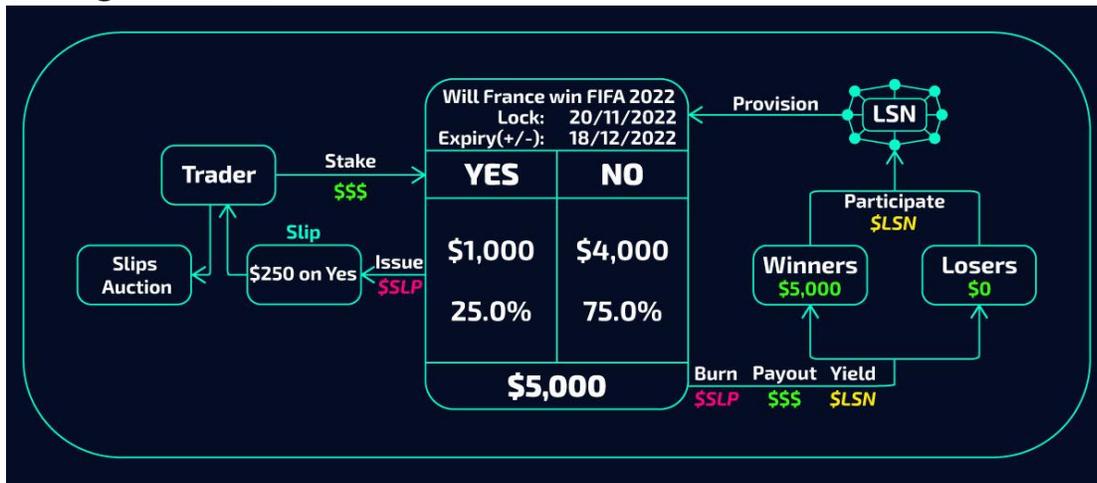
Slips – Non-Graphical Derivatives

The mechanics of Elision's prediction markets fundamentally differ from previous blockchain implementations. Instead of tokens whose values are linked to the odds within a pool, Elision distributes tradable derivatives representing ownership of wagers that entitle their holders to eventual rewards.

This serves 4 purposes to drive Elision's advantage:

1. Decouple coin value from market outcomes to eliminate impermanent loss for liquidity providers
2. Allow traders to exit positions that move beyond their risk tolerance
3. Allow profit-taking before market resolution
4. Enable invalid markets to refund wagers

When a wager is placed, a token(**Slip**) is minted that holds information about the entry time, amount, and pool odds. This slip entitles the owner to the rewards associated with that wager. The owner is then free to sell their slip to others in a way that suits them- although it is recommended to use an orderbook on the Elision network to avoid uncertainty. Upon market expiration, **current slip owners** receive associated payouts depending on the market, after which the slips lose all tangible value. Due to their decentralized nature, slips can still be traded after becoming worthless- therefore trader diligence is required to ensure the transaction settles **before** the markets expire.

Slip trading provides important functionality for prediction markets. First, it allows profit-taking without waiting for the market to resolve. Second, it provides a way to trade within locked convergent markets without creating an unfair environment. Finally, it allows an invalid market to return the original wagers to all participants without breaking the invariant- all while still allowing extrinsic profit-taking.

To incentivize liquidity and availability of slips, passive yield rewards are only remitted to the original owner if they hold their slip for the duration of the market.

Slip trading– Pre-Lock

Pre-lock Slip trading relies on traders willing to accept a small loss to pull their money out of a position that has moved beyond their risk tolerance.

For example, a trader wagering $100 on 50-50 odds might be willing to exit their position for $80 if the odds move against them to 33-66. They wanted to risk $100 on a 50% chance to double their money, not a 33% chance to triple their money.

This presents a unique opportunity for a risk-tolerant speculator to achieve statistical favorability; any discount they achieve creates a band of extrinsic value that is scaled by the return multiple. Further, if successful in predicting odds swinging back up, they can exit their position for a profit without waiting for market resolution. In the above example, the speculator purchasing the trader's position for $80 would be able to sell it for $100 if the odds rebound to 50-50.

While a market is open for trading, slips provide an opportunity to enter at a discount by buying ownership of another wager. They also limit profit-taking to the extrinsic value of positions on the underdog side, because a $100 position can sell for less than $100- but not for over $100(Since a trader can just wager $100 and receive a slip that way).

This limitation does not hold once a market is locked.

Slip trading– Post-Lock

A locked market disallows new wagers to prevent an informational advantage for traders who wait to the last second, effectively freezing the return multiples for both sides by immobilizing the odds. Although new slips can't be generated, trading ownership of existing slips is still allowed during this period because it doesn't change the payout odds. This phenomenon turns Slips into a derivatives class that provides unique advantages for traders and speculators

Slip trading in a locked market expands the capability to take profits from movement within both the favorite and underdog sides without breaking the invariant. As an event unfolds and information converges, the *real* odds deviate from the market's frozen *implied* odds. This deviation presents an opportunity for a speculator to realign the statistical neutrality within the market, effectively creating a state where a $100 wager can be worth more *or* less than $100- allowing profit-taking from either end.

For example, consider a Slip for a $100 wager inside a 50-50 market as the following:

$200 is the payout driven by the 2x multiple from 50-50 odds on a $100 wager.

Next, let's assume this market is **not locked** and moves towards 75-25:

We can see that the payout has now gone down to $133 due to the 1.33x multiple from the likelier odds. This is a result of the invariant being maintained.

How does this change if the market is locked?

Assume that the 50-50 market **was** locked and then moved towards an *implied* 75-25 (It's still 50-50):

The $100 wager was locked to a $200 return, but now the $200 return is at (an implied)75% odds.

Your slip lets you double your money 75% of the time!

You can sit on the slip, and assuming the odds truly are 75-25, you are in a state of statistical favorability. Or, you can lock this profit in and sell this favorable slip to a speculator.

The value that your slip is worth can be calculated by finding X such that a 75% chance to return $200 is statistically neutral:

In this case, x is equal to $150.

Therefore, your $100 wager is worth $150. This profit of 50% can be realized without actually risking the resolution of the market- you were correct in predicting the odds movement, allowing you to buy low and sell high.

Note that the implied 75% in the above example is an idealized number. In reality, it is an estimate made by a speculator of the *final implied resolution* odds at a snapshot in time before market resolution. It is their role to make educated guesses on what a frozen market's implied odds are when pricing the value of slips.

Consider a soccer game that was frozen at 50-50 before the start. As each team scores a goal and the game time runs down, the *implied* odds swing up and down- dragging the extrinsic values of the slips with them. The compounding of these factors makes a last-minute comeback very lucrative for those able to predict it.

The splitting of extrinsic and intrinsic value via the Slips derivative is the core innovation of Elision's trading mechanism.

Refunding Invalid Markets

Elision's separation of intrinsic and extrinsic value presents a another solution to the complexities around decentralized refunding of invalid markets. By pinning profit-taking to extrinsic value, the intrinsic invariant of the pot is always maintained. This means that refunds are given based on slip *face* value to all holders- an expected interaction for non-speculators. Processing refunds in this way does not require forcing 50-50 returns, nor an "invalid" outcome trading option. This simplifies trading and protects the network from malicious market makers looking to profit from camouflaging invalid markets.

Game Theory

The game theory creates a decentralized incentivization structure that promotes favorable interaction amongst Elision's 4 profit-motivated participants through a system of bonds, fees, slashes, and burns.

The 4 participants and their primary roles on the Elision network are:

- Market Maker
  Proposes configured markets
  Charges self-set commission to traders

- Provisioner
  Disputes misconfigured markets
  First-Reports valid markets

- Trader
  Interacts with markets and derivatives
  Pays commission and reporting fees

- Reporter
  Disputes tentative event outcomes
  Stakes on open reporting

These participants interact with one another across Elision's 4 primary decentralized mechanisms:

1. Market Making (Drafting)
2. Market Creation (Provisioning)
3. Trading
4. Outcome Resolution (Reporting)

Design decisions come with tradeoffs between benefit & cost, therefore a favorable interaction has a net-positive impact on the longevity of the network.

An important consideration is assuming one entity can be all the separate stakeholders at the same time, therefore any collusion that could lead to an advantage must be structured out. A sound design eliminates conflicts of interest.

Market Making (Drafting)

Creation Bond

Market makers are rewarded for creating properly configured markets by charging self-set commissions on volume that occurs within their markets. Proper configuration must follow community-determined guidelines on the wording, market types, resolution source, timings, and locking period.

A creation bond is paid by the market maker when submitting their configured market to the network. The purpose of this bond is to enable decentralized provisioning and provide seed liquidity for new markets.

- If provisioning approves the market, the creation bond is staked on both sides of the created market at 50-50. (*The equal seed stake creates statistical neutrality- i.e. the bonds will balance out to full refunds over time.*)

- The bond is slashed to the provisioners if the market is rejected.

The creation bond incentivizes provisioners to verify parameters of drafted markets through a decentralized dispute process that rewards them for rejecting invalid configurations. The dispute process protects market makers from malicious rejection attacks by incentivizing other provisioners to realign disputes and take the provisioning attacker's dispute stakes as easy profit.

Market Creation (Provisioning)

Dispute Stakes & Process

Once provisioning has received a market with a creation bond, an Augur-inspired dispute process is launched to resolve "Is this market valid?" with the Creation bond initially indefinitely staked on "Valid". If a provisioner spots an invalid market, they must commit a Dispute stake that is **0.1%** greater than the Creation bond towards "Invalid" to flip the tentative outcome. This is considered the first round of the dispute process.

If the tentative "Invalid" outcome is not disputed, the provisioner receives the Creation bond + Dispute Stake for an effective profit of **~100**%, and the market is rejected. However, should other provisioners deem that the previous round's provisioning was incorrect or improper, they can commit a dispute stake against the "Invalid" outcome to flip it back to "Valid". The required dispute stake for non-seed rounds is the amount needed to be 2x the disputed outcome. **This process repeats over multiple rounds with larger required stakes and longer round times until a tentative outcome is not disputed.** When this occurs the payout for all provisioners on the winning outcome is equal to the total stake on the losing outcome from the previous round(excluding the current round), minus the creation and provisioning bonds if the resolution is "Valid".

The purpose of refunding unsuccessful stakes- *if a round needed $100 to flip, but only $90 was committed, the $90 is refunded*- is to incentivize crowdfunding against a malicious resolution. Since an attack is irrational, it is easier to convince people to take the honest side. This implies that reducing barriers to crowdsourcing favorably impacts the security of the network.

Provisioning Bond

In addition to rejecting invalid markets, provisioners "bond" with valid markets to become their initial oracle reporters- granting a share of trading fees if the market is indeed valid, and their bond back if they also report properly.

The bond is paid by the first provisioner to stake on "Valid" and is equal to the creation bond.

- The bond is refunded should the Oracle finalize in line with the initial report.

- The bond is slashed and becomes the seed stake for open reporting if the provisioner misses their reporting window.

- The bond is slashed to Oracle reporters if the market is deemed invalid.

Once bonded to the market, a provisioner gains the ability to add (up to 10x the creation bond) and subtract (down to 1x the creation bond) to this bond to qualify for trading fees at any time. Note that when it comes to resolution, **it is only the initial creation-equivalent bond that is staked for eventual outcome reporting.** Anything over the 1x is remitted back to the provisioner at the time of the market event.

The provisioning bond provides a rewards mechanism for participation in times of compliant market creation. Having active bonds entitles the provisioner to a proportional share of rewards from trading fees. These trading fees accumulate into a provisioning pool tied to the market, rewarding the provisioner post-resolution if the market does not resolve as invalid. The rewards for bonding with valid markets are designed to be less than that of rejecting invalid markets, maintaining the provisioner's focus on primarily hunting for invalid markets. The provisioner UX is structured so that as their initial assessment against the validity of a market fails, they are still compensated for their effort by bonding with the now-deemed-valid market.

Although a provisioner bonding with a market is a vote of confidence in its validity, it is not guaranteed. Due to the decentralized nature of the network, a market maker can act as a provisioner to bond their own markets (This is a predicted flow). Therefore, the provisioning dispute mechanism is engaged to determine final validity. This does not mean 2 dispute sequences occur during provisioning, only that it is always triggered for each market.

Once a market has been determined to be valid, the provisioner who **first** staked an amount equal to the creation bond is bonded to the market and becomes its designated reporter. This can occur in any of the rounds- if no match is found, then a random "valid" dispute staker is selected. It is anticipated that bonding to a valid market is favorable- so random selection should be rare.

Once selected, the provisioning bond is locked until market resolution. The purpose of locking the provisioning bond is to protect against disincentivizing an "invalid" resolution during the early rounds of the oracle. This is because if a market resolves as invalid, the provisioning bond is the only non-dispute reward for oracle reporters –everything else is refunded. Without the provisioning bond, reporters have a very low incentive to properly report an invalid market.

The output of provisioning is a valid market with seed liquidity that has a designated oracle reporter.

Trading

Elision network strives to provide a frictionless experience for traders when it comes to under-the-hood protocol mechanisms. Although the security and reliability of the Oracle and Provisioning systems are paramount, the protocol seeks a rational balance with usability and product market fit for the end users. Traders should not have to worry about the validity of markets, nor their funds being locked for too long after a market event occurs.

To support these PMF principles, 2 fees are levied against traders when placing wagers.

Trading Fees

Initially set at 1%, this fee rewards provisioners and reporters for participating in the network. During times of high market and oracle fidelity, this fee is the sole incentivization mechanism that supports continued decentralized operations. Further, the scaling of this fee acts as a lever to nudge the market cap of LSN- maintaining a secure price target by modifying unit rewards that make deploying LSN into decentralized functions more/less attractive.

Trading fees accumulate across markets into a global pool as traders place wagers. This pool empties on a cadence (**Pulse**), paying out disputers and funding provisioner pools in proportion to how much capital they have deployed across all decentralized functions during that time period (Staked within provisioning disputes + bonded to valid markets + staked within oracle disputes).

To effectively nudge the market cap, trading fees are available to all LSN holders who wish to qualify. This has 2 implications:

- *Qualifying capital should be weighed equally*
  It is irrelevant to which decentralized function capital is committed, $1 will always entitle the participant to the same proportion of trading fees. This is done to create an unbiased distribution, removing a trading-fee preference for participation in one function over another.

- *No capital deployment limit should exist*
  Permitting all interested participants implies an uncapped deployment limit per pulse.
  Dispute staking is capped by design, therefore provisioning functions as the limitless qualifier for trading fees. In times of high oracle and provisioning fidelity, qualification for trading fees will be done by bonding to markets- creating them if needed.

Provisioning Pools

To disincentivize provisioning from creating arbitrary markets just to qualify for trading fees, the fees are accumulated every pulse into per-market "provisioning pools" that are paid out as post-resolution lump sums under the following rules:

- The fees are remitted to the provisioner should the market not resolve as invalid.

- If a provisioner no-shows, the fees are remitted to the first open reporter should the market not resolve as invalid

- The fees are burned should the market resolve as invalid.

This setup promotes valid markets, proper reporting, accelerated open reporting in the event of a no-show, and gives equal benefit to all participants (including traders) should a market be deemed invalid. It is important to note that unlike the provisioning bond that is slashed should the provisioner report incorrectly, the provisioning pool is burned only if the market is deemed invalid. A provisioner should only lose the trading fees in their bonded market *if it should never have existed in the first place*.

Commission Fees

Defaulted at 0%, this fee is set by the market maker to account for operating expenses with managing their prediction market brands. Although there is no cap on this fee, duplicate markets are allowed on the network; enabling free market forces to create a competitive landscape between market makers. It is expected that most market makers will minimize this fee to attract trading volume and undercut their competition.

Unlike trading fees, the commission is calculated on a per-market basis. After oracle resolution, the collected commission is remitted to the initial market maker as part of the distribution process. The commission is locked until post-resolution to allow full refunds in the event of an invalid market outcome, with the market maker receiving back only their creation bond.

Outcome Resolution (Reporting)

Oracle requirements can be plotted onto the blockchain trilemma. Pick 2:

- *Decentralized*
  Oracle results are crowdsourced from an aggregation of distributed opinions that have indiscriminate participation requirements, cannot be censored, do not require permission, and can't be overruled by a centralized entity.

- *Reliable*
  Oracle resolves correctly and is reflective of objective reality. Defense against malicious resolution is effective and has a high enough cost to be deemed irrational and economically infeasible.

- *Fast*
  Oracle resolves quickly once the market event occurs to minimize opportunity loss from locked earnings.

Since decentralization is inherent to the design, infrastructural security must be balanced with trader-facing product-market-fit. Users should accept that participation in a decentralized prediction market requires some sacrifices compared to centralized competitors, mainly when it comes to how soon their funds are unlocked post-event. Conversely, decentralized actors should accept that a consumer product requires an acceptable user experience to gain adoption and fund the rewards structure. Nothing happens if there are no traders.

A decentralized prediction market requires an oracle that can resolve a wide variety of informational queries. This can be accomplished either through a combination of specialized oracles selected for specific data feeds (financials, sports, etc) during provisioning, or by a generalized oracle designed to be data-agnostic. The generalized oracle was chosen because the complexity and subsequent reliability implications of maintaining, integrating, and selecting multiple oracles was determined not to be worth accelerating the resolutions at this time.

Elision uses an adapted design of Augur's generalized, capped, timed, and escalating force-dispute Oracle to achieve the decentralization requirements for our prediction markets.

In contrast to relying on optimistic intervention in the event of an input dispute, the entire oracle is built around triggering a dispute for every input. This *pessimism* allows the game theory to primarily focus on designing a robust decentralized dispute process to create an outcome that falls in line with the implicit axioms underpinning blockchain technology. Assuming and structuring against centralized collusion between malicious actor(s) is the only way to create a truly decentralized system.

This whitepaper will not re-describe the functionality, technical specs, and game theory of Augur's Oracle. Instead, it will outline the minimal required changes for adaption into Elision. Proposals for enhancing Augur's core design to rebalance the PMF will be out of scope for the initial main-net launch.

Augur Oracle Adaptation

The following are the required changes to integrate Augur's Oracle into Elision:

Designated Reporters

Augur

During market creation, market makers post a "Creation Bond" and choose a designated reporter.

The designated reporter has 24 hours to report the outcome of an event, with the creation bond being placed on their proposed outcome.

If the Designated reporter does not report within 24 hours, the oracle enters "Open Reporting" where the creation bond is given to the first public reporter to place on their proposed outcome.

Elision
Provisioners post bonds to become designated reporters becoming eligible for trading fees.

Implication:
Elision market makers do not need to pick designated reporters nor post oracle bonds. Provisioners post their own bonds and become designated reporters.

REP + Protocol Integrity

Augur
REP is the token used for participating in dispute rounds. This is different from the DAI that markets are traded in.

The market cap of REP is closely tied to the reliability and security of the Oracle, it must always be greater than 3x the sum of DAI OI within the markets. (It is not 2x because Augur assumes a 50% allowance for parasitic OI)

i.e. An attacker should not be able to extract more value out of their 51% attack that drains all the DAI from markets than the cost of acquiring 51% of REP.
ex. If the payout from draining markets (OI) is $100, it should cost more than $100 to acquire 50% of REP- implying a market cap of $200, which is 2x.

Trading fees are scaled up/down to influence the market cap of REP and consequently this multiple. The target is 5x.

Elision
All activity on the Elision network is done with the LSN token.

The market cap security theorem from Augur still holds, although with some minor math modifications:

To profitably 51% attack the network, an attacker must acquire 51% of *deployable* LSN for a *cost less than the sum of drained market OI.*

The market cap of LSN is split into 2 components- Tokens that are locked in markets (OI_m), and tokens that are available for deployment to disputes ($LSN\text{-}_d$). The ratio between these 2 components is what allows integrity of the protocol under the following arithmetic:
OI_m = Open Interest within markets
$LSN\text{-}_d$ = Deployable LSN
MC_{LSN} = Market Capitalization of LSN

$MC_{LSN} = OI_m + LSN\text{-}_d$

1. $\Sigma OI_m \leq \frac{1}{2} LSN_d$

ex. If the payout from draining markets (ΣOI_m) is $100, it should cost more than $100 to acquire 50% of deployable LSN (LSN_d) − implying the value of LSN_d must be at least $200.

Since $MC_{LSN} = OI_m + LSN\text{-}_d$ we can solve inequality **1.** in terms of the *open interest and market cap.*

2. $\Sigma OI_m \leq \frac{1}{3} MC_{LSN}$

ex. If the payout from draining markets (ΣOI_m) is $100, then this must be less than a third of the market cap- implying the value of MC_{LSN} must be at least $300.

Higher trading fees incentivize deploying LSN into decentralized functions over the markets, therefore influencing the proportion and driving integrity. The target is to keep OI under 20% of the market cap.

Implication:
The math reshuffle does not impact the fundamental definitions of the theorem, therefore there are no security implications from this change.

Participation Tokens

Augur

Market cap nudging through trading fees distribution requires all REP holders to be eligible for remittance.

Since dispute rounds are capped, there is only a maximum amount of REP that can be allocated per week to qualify for fees.

Augur solves this by allowing all REP to be committed every week as "participation", regardless of whether it was staked in a dispute or not.

This means all REP holders are equally able to benefit from trading fees, and thus the market cap of REP can be mechanically influenced.

Elision
Elision maintains the same approach to market cap nudging by allowing all LSN holders an uncapped mechanism to qualify for trading fees.

Although provisioning has a maximum amount that can be committed within a bonded market(10x the creation bond), there is no limit as to how many markets one provisioner can create and bond with.

This has the added benefit of promoting valid markets to be created for the network- as trading fees are only paid out if the markets resolve as valid.

Anybody who wishes to earn yield on their LSN must first create and provision the necessary number of markets required to commit their intended sum.

Implication:
The changes do not impact market nudging; however, they do require LSN holders to put in effort that is favorable to the network by creating markets for trading fees eligibility.