

# 1 Thesis: Market Design, Price Discovery and Temporal Liquidity

## 1.1 Design Philosophy

The Siprifi Prediction Market MVP v3 is intentionally designed as an **underlying settlement layer**, not as a monolithic on-chain exchange. The core thesis is that *price discovery, liquidity formation, and user interaction should emerge from market behavior rather than be enforced by protocol-level curves.*

This approach mirrors traditional OTC derivatives desks, where:

- Contracts are standardized
- Settlement is deterministic
- Pricing is negotiated and evolves organically

The blockchain is used strictly for:

1. Trustless minting and burning of exposure
2. Capital pooling and final settlement
3. Collateralization guarantees

All other dynamics are intentionally abstracted off-chain in the early phases.

## 1.2 OTC-Native Market Structure

Each prediction market is exposed to the user as a single OTC-style contract, not as a DeFi pool.

- There is no automated price curve on-chain
- There is no forced liquidity provision
- There is no protocol-defined price

Instead, price emerges from:

- User demand for protection or exposure
- Time remaining until event resolution
- Aggregate market sentiment

The YES token acts as a **time-decaying risk instrument**, whose perceived value is inversely proportional to the probability of event occurrence and the remaining duration until resolution.

## 1.3 Orderbook as a Narrative Device

The orderbook is not merely a trading primitive, but a **narrative interface**.

Displayed per market:

- Bid / Ask depth
- Last traded YES price
- Historical price chart
- Time-to-expiry overlay

Importantly, the orderbook is initially implemented **off-chain**, enabling:

- High-frequency updates
- Zero gas cost for order placement
- Flexible UX experimentation

Only matched trades are settled on-chain via the existing mint/burn mechanisms.

## 1.4 Temporal Price Dynamics

A core insight of the system is that YES token pricing naturally follows a **temporal decay curve**, even without an AMM.

Let:

$$P_{YES}(t) = f(D(t), R(t), T)$$

Where:

- $D(t)$  is demand for protection at time  $t$
- $R(t)$  is perceived residual risk
- $T$  is time remaining until resolution

Empirically:

- Early markets with high uncertainty exhibit high YES prices
- As time progresses without adverse signals, YES prices decay
- Late-stage markets converge toward binary outcomes

This behavior mirrors insurance premium decay and option theta in traditional finance.

## 1.5 Why No AMM in MVP

Automated Market Makers impose artificial liquidity and pricing assumptions that are incompatible with early-stage prediction markets:

- They require predefined curves
- They mask true demand signals
- They subsidize liquidity before organic interest exists

For this reason, Siprifi v3 explicitly avoids AMMs in its initial design, allowing:

- True price discovery
- Real bid-ask spreads
- Volatility driven by sentiment, not math

## 1.6 Future Evolution: Temporal Market Maker

Once sufficient market data is collected, the protocol can transition toward a **Temporal Market Maker (TMM)**.

This future module would:

- Use historical orderbook data
- Incorporate time-to-expiry explicitly
- Adjust liquidity provisioning dynamically

A conceptual pricing function could take the form:

$$P_{YES}(t) = \alpha \cdot \frac{1}{T-t} + \beta \cdot \sigma + \gamma \cdot S$$

Where:

- $\sigma$  is recent price volatility
- $S$  is market sentiment skew
- $\alpha, \beta, \gamma$  are governance-controlled parameters

Importantly, this Market Maker would be:

- Optional
- Modular
- Backward-compatible with OTC markets

## 1.7 Separation of Concerns

The architecture enforces a strict separation:

Layer	Responsibility
Solidity Core	Settlement, mint/burn, collateral
Off-chain Engine	Order matching, price discovery
Frontend	Narrative, charts, UX
Future MM	Liquidity smoothing, fallback pricing

This separation ensures that the system remains:

- Extensible
- Upgradable
- Resilient to UX iteration

## 1.8 Conclusion

Siprifi's market design deliberately prioritizes **emergent behavior over enforced liquidity**. By starting with an OTC-native, orderbook-driven system and evolving toward a temporal market maker only when justified by data, the protocol avoids premature optimization while preserving a clear path to scalability.

This philosophy positions Siprifi not as a prediction AMM, but as a **risk-native financial substrate**.