Siprifi Finance

Structured Credit Protocol for Binary Risk Markets

Abstract

Siprifi Finance is not a leveraged lending protocol. It is a structured credit system designed to integrate prediction market outcome shares into a decentralized financial architecture using principles borrowed from credit derivatives, clearing houses, and tranche-based risk allocation.

Unlike traditional DeFi leverage systems, Siprifi explicitly models binary tail-risk events and enforces solvency through capital reservation, temporal hierarchy, and correlation constraints. The protocol combines elements of prediction markets, Credit Default Swaps (CDS), and Central Counterparty (CCP) margining into a unified, conservative framework.

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1 Conceptual Overview

Prediction markets produce binary payoff instruments with extreme correlation and discontinuous terminal value. Traditional lending protocols are structurally incompatible with such assets due to liquidation assumptions and continuous price dynamics.

Siprifi reframes prediction market participation as a form of structured credit exposure rather than leverage.

- There is no rehypothecation of risk.
- There is no recursive leverage.
- All exposures are pre-capitalized.

Each market is treated as a credit instrument with explicitly modeled default scenarios.

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2 Core Financial Analogy

Siprifi combines the following financial primitives:

- **Prediction Markets**: Binary payoff contracts resolved at maturity.
- **Credit Default Swaps**: Protection against event failure.
- **Structured Tranches**: Senior and subordinated claims.
- **Clearing Houses**: Pre-funded margin, no reliance on post-default liquidation.

The protocol operates as a decentralized clearing house for binary credit risk.

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3 Contract Structure

Each market consists of a base contract and optional subordinated contracts.

3.1 Base Contract (Senior Tranche)

The base contract is fully collateralized by an external, non-binary asset (e.g. ETH, stablecoins).

- Full principal backing.
- Longest maturity.
- Absolute payment priority.

This contract defines the maximum notional exposure of the system.

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3.2 Subordinated Contracts (NO-Backed Credit)

Subordinated contracts represent conditional credit exposure backed by the *non-occurrence* of the base event.

They are not leveraged positions. They are short-dated credit instruments contingent on the base contract's solvency.

Key constraints:

- Shorter maturity than the base contract.
- Mandatory statistical decorrelation from the base event.
- Explicit subordination.

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4 Correlation Constraint

Let E_0 denote the base event and E_1 a subordinated event.

Siprifi enforces:

$$\mathbb{P}(E_0 \cap E_1) \approx 0$$

This ensures that payouts cannot coincide probabilistically.

Markets failing correlation tests are rejected at creation.

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5 Temporal Hierarchy

Let T_0 be the maturity of the base contract and T_1 the maturity of the subordinated contract.

$$T_1 < T_0$$

This enforces a strict settlement order. Subordinated contracts are resolved before the senior claim can mature.

This mirrors margining practices in clearing houses and short-dated CDS contracts.

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6 Capital Reservation and Solvency Buffer

Siprifi reserves explicit capital against the worst-case failure of subordinated positions.

Let MV_g represent the market value of a correlated group g.

Define the Binary Asset Solvency Buffer (BASB):

$$BASB = \sum_{g \in G_N} MV_g$$

This buffer assumes total loss of the largest correlated exposures.

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7 Borrowing Power Reinterpretation

Traditional borrowing power is replaced with **Effective Credit Capacity**.

$$ECC = \max(0, BBP - BASB)$$

Where:

- BBP is theoretical senior collateral capacity.
- $BASB$ is reserved capital for tail events.

This is not leverage. It is capital allocation.

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8 Settlement Mechanics

8.1 Subordinated Contract Settlement

If a subordinated YES contract wins:

- Payment is made from reserved buffers and protocol fees.
- Senior collateral remains untouched.

If it loses:

- NO absorbs the loss.
- Capital is released back into the system.

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8.2 Senior Contract Settlement

The base contract settles last and has absolute priority over all remaining capital.

No scenario exists where a subordinated claim can impair senior payouts.

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9 Worst-Case Scenario Analysis

Siprifi explicitly models a 100% Value-at-Risk assumption for subordinated positions.

$$\forall g \in G_N : MV_g(T) = 0$$

Even under this assumption:

$$HF \geq 1$$

The system produces no bad debt.

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10 System Invariants

For all users and all times:

No concurrent payout of senior and subordinated tranches

No reliance on liquidation liquidity

No recursive leverage

All losses are pre-funded

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11 Conclusion

Siprifi is a structured credit protocol for binary risk markets.

By combining prediction markets with CDS-style risk modeling and clearing house mechanics, Siprifi enables safe capital efficiency without leverage, without liquidations, and without systemic fragility.

The protocol does not attempt to eliminate risk. It isolates, prices, and contains it.