A Microstructure Perspective on Prediction Markets

Nicholas Palumbo[1]
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1. Introduction

There is significant debate surrounding prediction markets today. A central question concerns how event contracts — the defining financial instrument of these markets — should be classified. Are they purely speculative instruments, or do they resemble more traditional financial products in certain respects?

Regulatory scrutiny in several jurisdictions reflects this classification challenge. Event contracts do not fit neatly into existing categories of securities, derivatives, or gaming instruments. The underlying issue is not simply whether they are innovative, but how they should be understood within established economic and regulatory frameworks.

Emerging asset classes often experience periods of conceptual ambiguity before norms stabilize. The evolution of digital assets over the past decade illustrates how uncertainty around classification can shape both market development and regulatory response. Greater clarity at early stages may reduce confusion and misaligned expectations.

This paper asks a narrower, structural question: can established market microstructure frameworks help clarify how risk is allocated in event-contract markets?

To explore this question, I examine the orderbook dynamics of Kalshi's event contracts using trade-level data from the NFL regular season. Rather than focusing on price levels or prediction accuracy, the analysis concentrates on passive limit orders — the mechanism through which liquidity is supplied. The way liquidity providers accumulate and manage inventory offers insight into where economic exposure ultimately resides.

The methodology is intentionally simple. Basic accounting identities are used to clean and reconstruct terminal exposure across markets. A multivariate regression is then applied to evaluate which observable variables correlate with liquidity provider profitability. These results are not presented as definitive conclusions, but as empirical inputs into a broader classification discussion.

Finally, I propose a framework for describing liquidity provision across different market structures. The goal is not to prescribe regulation or criticize existing platforms, but to clarify terminology and highlight why classification questions matter as prediction markets continue to evolve.

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[1] *This paper reflects the author's personal views. All analysis is based exclusively on publicly available data, exchange rulebooks, and regulatory filings. No non-public or proprietary information was used in its preparation. The author is not affiliated with any exchange referenced herein, and this work does not represent the views of any current or former employer.*

2. Data and Methodology[2]

2.1 Kalshi Market Design

For sports, Kalshi designates game matchups as "events" and ascribes a non-fungible "event_id" to each one. For each "moneyline" event, there exists two securities: one on Team A to win and one on Team B to win. Users can buy "no's" but that appears to be a simple UX decision, there does not seem to be a true "no contract." Instead, user orders appear to be routed according to the direction of their opinion.

Kalshi publicly discloses liquidity incentive programs designed to reward passive quoting. The economic sufficiency of these programs relative to observed exposure patterns is an empirical question examined below. However, in markets where spreads collapse toward one cent, publicly described incentive structures alone may not fully offset the inventory risk borne by sustained liquidity providers. The persistence of narrow spreads may therefore reflect participants operating under alternative capital considerations or risk tolerances.

In standard user accounts, sell orders require existing inventory ownership, limiting short-selling activity for many participants. The sustained presence of passive sell liquidity in these markets suggests that some participants operate under different collateral or inventory arrangements, though the precise structure of those arrangements is not publicly detailed.

The rest of this analysis uses the above to draw the following assumptions:

- Given the inventory constraints of fully collateralized retail trading and the observed presence of sustained two-sided passive quoting, net contract supply appears to be endogenously generated through passive limit order interaction rather than drawn from a fixed, pre-existing issuance pool
- Unlike options or futures markets, event contracts do not reference an underlying spot asset that permits mechanical hedging; this structural feature is relevant when evaluating inventory persistence

Critically, this analysis focuses on spread capture and terminal exposure and does not attempt to model potential fee rebates, incentive payments, or off-exchange hedging activity.

2.2 Dataset

The empirical analysis covers all trades in Kalshi's NFL regular season moneyline markets across 18 weeks.

For each game:

- Passive executions were identified through limit-order fills (the "Market Making" cohort)
- Exposure was signed (+1 for buy limits; −1 for sell limits)

[2] *All data used in this analysis were obtained from publicly accessible exchange APIs and regulatory filings.*

- Cash flow was calculated as price × quantity (negative for executed buy limits; positive for executed sell limits)
- Terminal liability was computed by netting winning-side exposure against total cash received on both markets

This produces a direct measure of outcome-dependent exposure—a feature more consistent with underwriting risk vs the market risk classically associated with passive intermediation.

2.3 Construction of Terminal Exposure

Let:

- E_win = net passive contracts on the winning outcome
- C_a = net cashflow related to Team A contract
- C_b = net cashflow related to Team B contract

Terminal asset (liability) is:

Asset/Liability = C_a + C_b + E_win

A liquidity provider functioning as a neutral intermediary would expect exposure to approach zero over time with most profits coming from C_a + C_b. Persistent terminal exposure (where E_win dominates C_a +C_b) is less commonly associated with classical passive intermediation models.

3. Aggregate Findings

Across the full NFL season:

- Passive liquidity providers accumulated net exposure in the direction of realized outcomes in the majority of markets
    - In most cases, they had a terminal asset on one outcome and a terminal liability on the other
- Aggregate profitability was positive (approximately $29 million)
    - On average, the sum of terminal assets was greater than the sum of terminal liabilities
- Weekly P&L exhibited significant volatility, with pronounced drawdowns during adverse weeks
    - LPs are winning on average, but are not without weeks of significant losses

The return profile exhibits features that extend beyond simple bid-ask spread capture:

- Managed imbalance
- Volume-weighted pricing discipline
- Acceptance of directional outcome risk

These characteristics are more consistent with models in which liquidity providers tolerate some degree of outcome-dependent exposure, not necessarily classical market making.

4. Regression Analysis

To evaluate whether profitability aligns with underwriting dynamics, markets were partitioned into:

- Games where passive liquidity realized net gains
- Games where passive liquidity realized net losses

4.1 Specification

For each subsample, the following regression was estimated:

Dependent Variable:

- log (Terminal Asset (Liability))

Independent Variables:

- log (Winning Trade Volume)
    - total winning trades in dollars
- log (Winning / Losing Volume Ratio)
    - logged ratio of trades made on winner to trades made in loser (both in dollars)
- Average trade price
    - Absolute value of total cash divided by total trades

These variables proxy for underwriting controls:

- Volume concentration
- Flow imbalance
- Pricing discipline

4.2 Results

Across both gain and loss subsamples:

- Winning trade volume was statistically significant
- Volume imbalance ratio was highly significant
- Average price exhibited moderate but consistent significance

Coefficient directionality flipped appropriately between gain and loss samples.

The results suggest that terminal outcomes are correlated with observable flow imbalances. Profitability appears associated with pricing and managing imbalance rather than with passive intermediation where inventory is offset and spread capture is considered the main economic driver.

4.2.a Regression Results on Terminal Assets

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.77
R Square	0.59
Adjusted R Square	0.58
Standard Error	0.45
Observations	135.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3.00	38.46	12.82	62.90	0.00
Residual	131.00	26.70	0.20		
Total	134.00	65.16			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-2.94	1.14	-2.58	0.01	-5.19	-0.69
log_taker_dollars_on_realized_winner	1.02	0.12	8.44	0.00	0.78	1.26
log_winner_to_loser_dollars	-3.13	0.39	-8.12	0.00	-3.89	-2.37
avg_winner_price	3.58	1.03	3.48	0.00	1.54	5.61

4.2.b Regression Results on Terminal Liabilities

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.77
R Square	0.59
Adjusted R Square	0.58
Standard Error	0.42
Observations	135.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3.00	32.71	10.90	61.66	0.00
Residual	131.00	23.17	0.18		
Total	134.00	55.88			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.87	0.84	1.04	0.30	-0.79	2.52
log_taker_dollars_on_realized_winner	1.14	0.11	10.88	0.00	0.94	1.35
log_winner_to_loser_dollars	2.63	0.48	5.50	0.00	1.68	3.58
avg_winner_price	-5.89	0.86	-6.83	0.00	-7.60	-4.19

4.3 Interpretation

The evidence suggests:

1. Passive liquidity provision systematically absorbs residual demand imbalance
2. Exposure persists through contract resolution
3. Profitability depends on managing, not eliminating, terminal risk

Interestingly, these features seem to share more economic similarities to another form of liquidity provision - underwriting.

5. Intermediation vs. Underwriting: A Structural Distinction

The distinction between intermediation and underwriting can be framed in terms of how risk is originated, distributed, and resolved.

In traditional equity markets:

- Securities are issued independently of secondary trading
    - Individuals trading Apple stock on brokerage apps do not trade **directly** with Apple's treasury
- Market makers facilitate transactions between holders
    - Transactions **do not** affect total outstanding securities; economic scarcity exists
- Exposure arises from temporary inventory imbalance
    - It is **not** the main profit engine of liquidity provision; it is a temporary risk that LPs must take to achieve scalable profits via bid-ask capture

In traditional options markets:

- Contracts are created bilaterally at the time a purchase request is made
    - Liquidity providers in these markets do "create" contracts but via mechanisms that introduce materially different economics to traditional underwriting
- Market makers typically hedge most of their inventory exposure via mechanical transactions on underlying spot markets
    - For example, an options market maker that sells call options on TSLA may go long on the underlying to hedge their profits against market movements, creating a "synthetic instrument" to serve as a counterbalance to otherwise uncovered exposure
- Critically, the synthetic instrument practically exists in concept prior to contract creation
    - As opposed to underwriting, where there are no such guarantees that you will be able to balance your exposure prior to creating a contract

In underwriting (insurance, lending, gaming, etc.):

- Supply is created in response to demand
    - The contract does not exist without the underwriter
- The intermediary assumes terminal outcome risk, because nobody else can

    - Insurance companies, banks and sportsbooks all have **relevant expertise** and **sophisticated, proprietary risk models** that allow them to do this
- Profitability depends on pricing discipline and pricing power is far more concentrated
    - Market participants are either savvier (Investment Banks and Consultancies are hired as agents) or there exists some kind of regulatory framework that prevents price gouging
- Underwriters win in expectation, not on every transaction they originate
    - Banks have defaults in their portfolios
    - Insurance companies occasionally pay out claims

Event contracts raise interesting questions about how this distinction should be applied. Because contracts are created and extinguished within the trading venue itself, liquidity provision may involve assuming net outcome exposure rather than merely recycling existing supply.

The economic consequences are substantial. Certain structural features may complicate strict outcome-neutral inventory management, leading to profits more dependent on outcome variance than one would expect. It would logically follow that the market dynamics inherit some qualities of underwriting. This raises questions about whether traditional incentive frameworks fully capture (and address) the economic characteristics observed here.

6. Market Structure of Event Contracts

Event contracts on U.S. exchanges exhibit four defining characteristics:

1. **Dynamic Supply Creation –** Contracts expand or contract
2. **Direct Retail Distribution –** End users trade directly against posted liquidity
3. **Binary Resolution –** Contracts collapse to either $0 or $1 at outcome
4. **No Underlying –** There is no relevant spot market attached to event contracts

Because contracts are dynamically created and retired within the venue, supply characteristics differ from those in markets with pre-existing issuance. When demand concentrates on one side of a contract, supply is expanded through limit-order interaction rather than constrained by pre-existing issuance.

Under these conditions, passive liquidity providers may accumulate imbalanced exposure that survives through settlement.

7. Conclusion

Prediction markets have the potential to evolve into meaningful venues for hedging and probabilistic price discovery. However, the empirical patterns observed here invite further discussion regarding how liquidity provision in event-contract markets should be classified.

Clarifying terminology and economic structure may help align expectations among participants, regulators, and market operators as this asset class continues to evolve. The future of event contracts depends less on narrative and more on structural coherence. By making a more

concerted effort to explore the distinction between passive liquidity provision and underwriting – a distinction that one could argue has never really been needed before – we can better understand this emerging asset class and set it up for long term success.

If liquidity provision in event-contract markets structurally resembles underwriting rather than classical inventory-neutral intermediation, then assumptions about capital adequacy, incentive design, and risk distribution merit closer scrutiny. Classification is not merely semantic; it determines how risk-bearing is understood and regulated.

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