

ENGINEERED LIQUIDITY: EXPLOITING MARKET MAKER HEDGING VIA OPTIONS AS A MECHANISM FOR INSTITUTIONAL POSITION ACCUMULATION

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POVZETEK: Raziskava opisuje teoretično strategijo, ki jo uporablja veliki institucionalni trgovci, da sestavijo pozicijo v podlagnem vložku, uporabljajo limitne narave in opcije. Glavni problem je nedovoljena naravna likvidnost, ki bi omogočila izvajanje narave na željenem cijenju in količini. Zamišljeni način je, da institucionalni trgovci kupujejo veliko količino opcij brez ekonomskega namena, kar običajno obvešča trgovce za opcije (trgovce za likvidnost) za odražanje delta in negativno gamma. To pomeni, da morajo izvajati agresivne prodaje, ki so potrebne za odražanje negativnega gamma. Trgovski narave to zamenjajo z limitnimi naravami, sestavljajo pozicijo na znatno nižji ceni, kot bi to omogočilo direktno trgovino. Po završitvi limitnih narav, institucionalni trgovci odpravljajo opcije, kar povračijo likvidnost in vrne ceno podlagnega vložka na podlagno vrednost.

METODA: Raziskava je teoretična in se osredotoči na analizo obstoječih literatur o tržnem mehanizmu in likvidnosti. Avtorji se odvisijo od teorije kontinuiranega lekciranja, teorije manipulacije z trženjem in proračunov gamma in inventarizacije. Metodologija je založena na empirični podatki o vložkih opcij in likvidnosti, ki so jih omogočili raziskovalci v preteklosti.

KLJUČNE UGOTOVITVE:

- Institucionalni trgovci uporabljajo opcije, da obveščijo trgovce za opcije za odražanje delta in negativno gamma, kar pomeni agresivne prodaje.
- Trgovski narave, ki so obveščeni, izvajajo agresivne prodaje, ki so potrebne za odražanje negativnega gamma.
- Trgovski narave, ki so obveščeni, izvajajo agresivne prodaje, ki so potrebne za odražanje negativnega gamma.
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POMEN ZA TRGOVANJE: Ta strategija omogoča institucionalnim trgovcem, da sestavijo pozicije v podlagnem vložku na znatno nižji ceni, kot bi to omogočilo direktna trgovina. To je posebno koristan za trgovce, ki uporabljajo limitne narave, saj imajo več kontrole nad ceno, na kateri se narave izvajajo. Ta strategija je težko razpoznati kot manipulacijo, saj je zelo mehanizmov, ki so potrebni za njeno izvajanje.

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ABSTRACT

This paper investigates a theoretical trading strategy employed by a large institutional market participant seeking to accumulate a substantial position in an underlying asset via limit orders. The primary friction encountered is the lack of guaranteed natural liquidity to execute the order at the desired price and volume. The intuitive alternative—directly depressing the asset price using market sell orders—is economically irrational: a buyer has no incentive to sell at a loss merely to lower the entry price, a premise supported by empirical micro-structure literature and fundamental cost-benefit analysis. Instead, the institutional actor utilizes an indirect channel: purchasing a large volume of options with zero economic intent regarding the option contract itself (neither for speculative gain nor for hedging). The sole purpose is to force the option writer (the market maker) into a positive delta and negative gamma exposure, thereby compelling immediate delta-hedging. This serves as the initial catalyst. Crucially, this maneuver targets solely the mechanical rules governing market makers, rather than exploiting non-dealer market participants, stop-loss triggers, or informational asymmetry. The market maker operates deterministically according to strict risk-management protocols. As the initial hedge depresses the underlying price, the negative-gamma market maker is forced to execute aggressive market sell orders in a self-reinforcing dynamic feedback loop. The institutional investor's pre-placed limit buy order absorbs this engineered liquidity, building a large position at an average price significantly lower than direct market execution would permit. Upon limit order completion, the institutional investor unwinds the put options, neutralizing the market maker's gamma/delta exposure and prompting a reverse hedging flow (buying), which restores the underlying asset price toward its baseline. While visually mimicking classical market manipulation or "stop-hunting," this dynamic is shown to be a single-objective, single-direction accumulation strategy whose two-way price path is merely a mechanical byproduct of market maker inventory adjustments.

1. INTRODUCTION

Options trading volume has experienced exponential growth over recent decades (e.g., expanding from 1,000 contracts in 1983 to over 100 million in 2018, accounting for approximately 75% of futures contract volume according to CFTC metrics). Concurrently, the study of dealer positioning and structural metrics—such as Gamma Exposure (GEX), 0DTE option flows, and short-squeeze dynamics—has transitioned from an esoteric academic subfield into mainstream financial practice.

This paper addresses a central question: *Can, and through what precise mechanism, an institutional investor exploit the deterministic, pre-hedging obligations of option market makers to engineer cheap underlying liquidity for position accumulation?*

2. COMPREHENSIVE LITERATURE REVIEW

2.1 Theoretical Foundations of Trade-Based Manipulation

Kyle (1985) established the foundational continuous auction framework featuring informed insiders, noise traders, and competitive market makers, serving as the benchmark for market microstructure analysis.

Allen & Gale (1992) formalized the definition of "trade-based manipulation," demonstrating how market participants can alter asset prices strictly through buying and selling actions without disseminating false information.

Ohashi (2022) analyzed "Momentum Ignition Price Manipulation," illustrating how speculators trigger momentum traders to generate illicit profits, noting how pricing rules (uniform vs. discriminatory) govern strategy sustainability.

Relation to Thesis: While Ohashi models the exploitation of discretionary momentum traders, the present paper models the target as the market maker itself. The market maker acts strictly via non-discretionary mechanical risk rules (delta/gamma neutrality). This represents a fundamental paradigm shift: the mechanism does not rely on deceptive signals to rational agents, but on structural regulatory and risk constraints embedded in market-making infrastructure.

2.2 Hedging Mechanisms: Gamma vs. Inventory Effects

Egebjerg & Kokholm (2024) separate the continuous gamma effect (dynamic hedging in response to price movement) from the instantaneous "inventory effect"—the immediate price impact produced when a market maker absorbs a new option order prior to any underlying price movement.

Relation to Thesis: This provides the empirical-theoretical validation for the initial phases of our model: initial delta-hedging occurs immediately upon option absorption, prior to subsequent price feedback.

2.3 Net-Short Dealer Positioning and Asset Liquidity

O'Donovan, Yu & Zhang (2023) demonstrate that when market makers hold net-short option positions, their dynamic hedging consumes rather than provides underlying liquidity, creating structural market fragility—an effect amplified in assets with constrained baseline liquidity.

Relation to Thesis: This anchors Phase 3 of our framework: once the dealer is forced into a net-short put position, it transitions into a mandatory liquidity consumer—precisely the structural role engineered by the institutional accumulator.

2.4 Legal and Regulatory Frameworks

Danger, Flagge & Outen (2019, CFTC) developed a legal-economic framework to differentiate legitimate hedging from unlawful manipulation surrounding option expiration. A key finding is that a standard option holder does not benefit from driving the underlying price because doing so merely increases position delta without locking in profits.

Relation to Thesis: Our framework explicitly departs from the CFTC baseline scenario. The institutional accumulator's profit is not realized on the option payoff itself, but on the underlying asset position accumulated at a depressed price. Consequently, standard CFTC tests regarding "holder non-profitability" fail to capture this

dual-channel mechanism. This paper extends the CFTC's "uneconomic trading" doctrine (executing loss-making trades without independent economic purpose) to multi-asset cross-channel accumulation.

3. PROPOSED THEORETICAL FRAMEWORK (INTEGRATED MODEL)

The strategic mechanism operates through five sequential phases:

Phase	Stage Title	Mechanism & Market Action
Phase 1	Entry & Positioning	Institutional participant places a large passive limit buy order in the underlying asset at $P_0 - \Delta P$ below current market price (P_0). Simultaneously purchases a large volume of near-the-money (ATM) put options.
Phase 2	Initial Hedging (Inventory Effect)	The market maker writes the put options, assuming positive delta ($\Delta > 0$) and negative gamma ($\Gamma < 0$). To maintain delta neutrality, the market maker immediately sells underlying shares.
Phase 3	Negative Gamma Feedback Loop	As the underlying price declines from initial dealer sales, the market maker's negative gamma accelerates required short sales. The dealer becomes a forced liquidity consumer via aggressive market sell orders.
Phase 4	Liquidity Absorption	The pre-placed limit buy order absorbs the market maker's forced selling pressure, completing the accumulation at an average execution price lower than the baseline "but-for" price.
Phase 5	Unwind & Price Mean-Reversion	Upon limit order execution, the institution unwinds/closes the put option position. The market maker buys back underlying shares to close the delta hedge, returning the asset price to equilibrium.

4. MATHEMATICAL FORMALIZATION & PROFITABILITY CONDITIONS

4.1 Variable Definitions

- P_0 : Baseline underlying asset price prior to strategy execution.
- Q : Total target quantity of underlying shares to accumulate.
- $\Delta\delta$: Cumulative delta shift of the option position across execution.
- $S_{MM} = \Delta\delta \times Q$: Total quantity of shares sold by the market maker during hedging.
- P_{strat} : Average execution price achieved by the institution under engineered liquidity.
- P_{raw} : Expected average execution price if accumulated directly via market orders without options.
- C_π : Total premium paid for the option contracts.
- $\Pi_{options}$: Net profit or loss realized upon unwinding/closing the option position.

4.2 Net Profitability Equation

The net economic value realized by the institutional accumulator (Π) is governed by:

$$\Pi = (P_{raw} - P_{strat}) \times Q - C_{\pi} + \Pi_{options}$$

The strategy is economically viable if and only if $\Pi > 0$, indicating that the acquisition cost savings in the underlying market exceed the net friction of the options transaction.

4.3 Key Analytical Thresholds

- **Threshold Option Size:** The option position must exceed a minimum threshold volume relative to daily average volume (ADV) to ensure dealer hedging overcomes organic order flow absorption.
- **Limit Order Calibration:** Placing the limit order too close to P_0 fails to maximize price displacement savings, while placing it too deep risks incomplete execution.

5. LEGAL AND ECONOMIC DISCUSSION

A primary legal question is whether purchasing options with the explicit intent to trigger predictable dealer hedging constitutes illegal market manipulation under the "uneconomic trading" standard.

Arguments for Manipulation: The buyer's subjective intent is not to profit from option value directly, but to distort the underlying market to benefit a separate position—matching the CFTC's framework for multi-market manipulation.

Arguments for Legitimate Trading: Unlike spoofing or marking the close, every transaction is fully executed, market-priced, and carries genuine market risk (option premium decay and execution risk). No false information is disseminated, and the market maker executes contractual risk obligations freely.

6. REFERENCES

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