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The True Aggression Framework

A Quantitative Framework for Evaluating Initiative Participation in Auction Markets

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Abstract

Executed volume, bid-ask delta, cumulative delta, footprint imbalance, and volume profile describe important aspects of market activity. Yet these tools do not always distinguish initiative that changes the auction from initiative that is absorbed, exhausted, or poorly located. The True Aggression Framework proposes a structured method for evaluating aggressive participation through five public dimensions: magnitude, efficiency, persistence, location, and consequence. It combines time-series and price-level representations with Auction Market Theory and market-microstructure principles while intentionally withholding proprietary formulas, thresholds, weighting, and execution logic. This whitepaper defines the framework, explains its software architecture, presents disclosure-safe examples, identifies limitations, and establishes a formal validation program.

1. Origin of the Research Question

The research began with a practitioner observation that immediate price movement requires participants willing to cross the spread and consume available liquidity. That observation, encountered while studying Trader Dale's discussion of aggression and order building, prompted a deeper question: if aggression is the mechanism through which price is displaced, can its informational quality be evaluated more effectively than signed volume alone?

The question became more important after repeated comparisons between a custom aggression oscillator and traditional cumulative volume delta. In selected sequences, the custom representation made hidden divergence, absorption candidates, and exhaustion candidates easier to observe. These observations were not treated as proof of superiority. They became the foundation for a research framework and a software architecture designed to support falsifiable testing.

2. The Measurement Gap

- Volume measures how much traded.
- Delta estimates the imbalance between activity executed at the offer and at the bid.
- Cumulative delta shows how classified imbalance accumulates through time.
- Footprint charts show where transactions occurred within bars.
- Volume profile shows where the auction conducted business by price.

The unresolved questions are qualitative and contextual: Was the initiative effective? Did it persist? Was it absorbed? Did it occur at a meaningful location? Did the auction accept the movement, reject it, or return to its origin? The True Aggression Framework is designed around these questions rather than a single signal.

3. Microstructure and Auction Foundations

In an electronic limit-order market, active orders consume passive liquidity. The price response depends not only on the amount of trading but also on available depth, order-flow imbalance, replenishment, and the market's willingness to continue conducting business away from prior value. The framework does not claim to identify informed participants or institutions. It evaluates the observable interaction between initiative and auction response.

Auction Market Theory supplies the contextual layer. Aggression inside accepted value may be rotational; aggression at an edge may be responsive, initiative, trapped, or the beginning of price discovery. The same numerical reading can carry different meaning depending on balance, discovery, profile location, session structure, and subsequent acceptance.

4. Public Definition of True Aggression

True Aggression = initiative activity interpreted through magnitude, efficiency, persistence, location, and consequence.

Raw aggression describes spread-crossing activity. True Aggression is the framework's term for the portion of that activity assigned greater informational relevance after context and response are considered. The production implementation remains proprietary. Public disclosure is limited to the conceptual dimensions, research hypotheses, architecture, and selected descriptive examples.

5. The Five Dimensions

Magnitude

The relative scale of initiative activity. Magnitude matters, but large effort can still be absorbed or structurally late.

Efficiency

The relationship between effort and auction progress. Efficient initiative displaces price and attracts follow-through; inefficient initiative produces limited progress.

Persistence

Whether participation continues, decays, alternates, or transfers across subsequent observations.

Location

Where activity occurs relative to value, profile nodes, prior extremes, Initial Balance, developing structure, and liquidity references.

Consequence

What the auction does afterward: accept, reject, rotate, continue, revisit, defend, or invalidate the origin.

6. Absorption, Exhaustion, and Hidden Participation

Absorption is inferred when active pressure produces less progress than expected because opposing liquidity accommodates the activity. Exhaustion describes declining willingness or capacity to continue the auction. Hidden participation is a descriptive term for a transfer or weakening of control that is not obvious from price alone. Each is treated as a candidate state, not direct knowledge of participant intent.

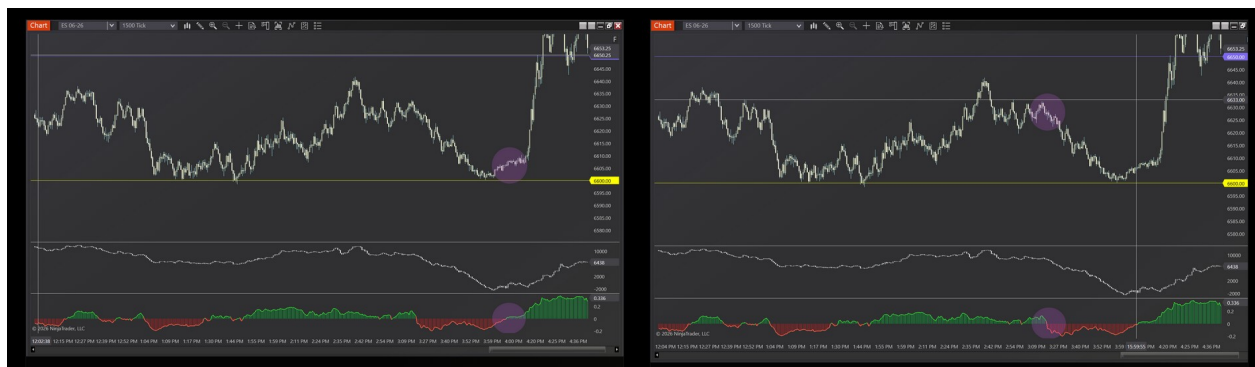


Figure 1. A time-series comparison in which price and participation no longer tell the same story. The example illustrates a research state, not a deterministic signal.

7. Horizontal and Vertical Analysis

The horizontal view follows participation through time and supports analysis of persistence, divergence, transition, and rate of change. The vertical view organizes participation by price and supports analysis of origin, concentration, dominance, node interaction, and revisit behavior.

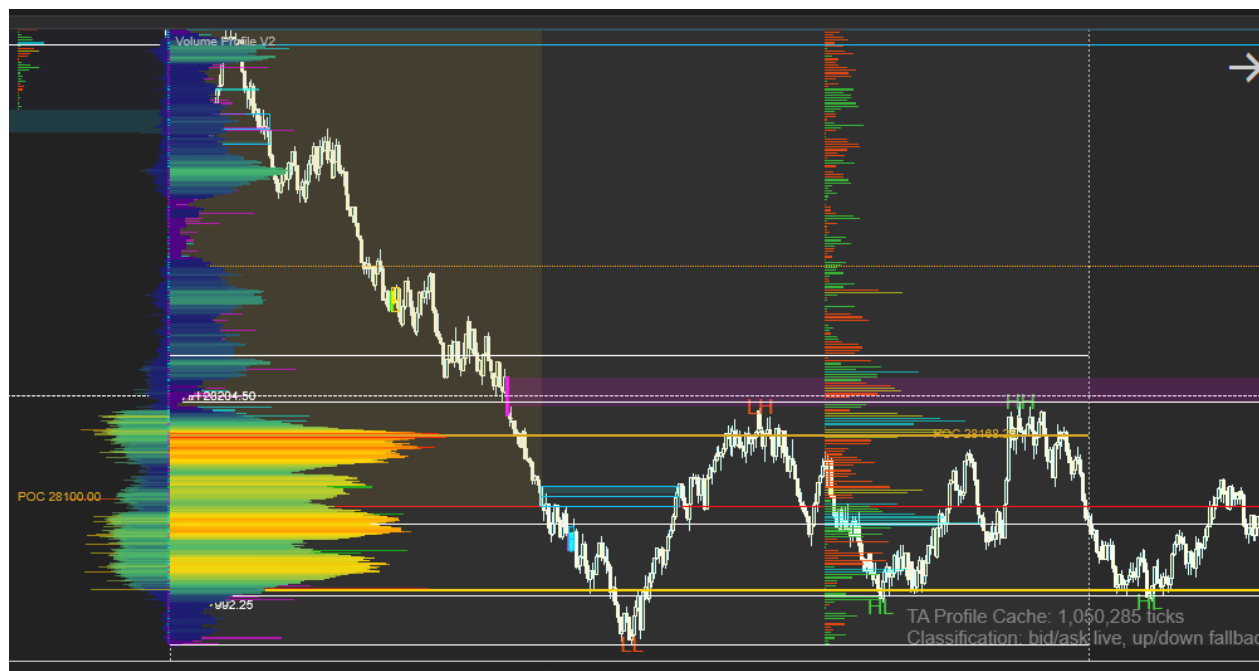


Figure 2. A price-level representation of directional participation beside conventional profile structure.

The vertical application is a central extension of the framework. It asks whether price areas associated with qualified initiative display distinct behavior when revisited. These origin zones are not assumed to hold. A revisit can produce defense, acceptance, rotation, failure, or complete invalidation.

8. Integration with Volume Profile

Volume profile identifies where the auction conducted business. True Aggression asks what kind of initiative helped create that business and what happened afterward. At high-volume nodes, the framework studies whether activity reflects acceptance, inventory transfer, trapped initiative, or defended participation. At low-volume nodes, it studies whether initiative produces efficient discovery or fails back into value.

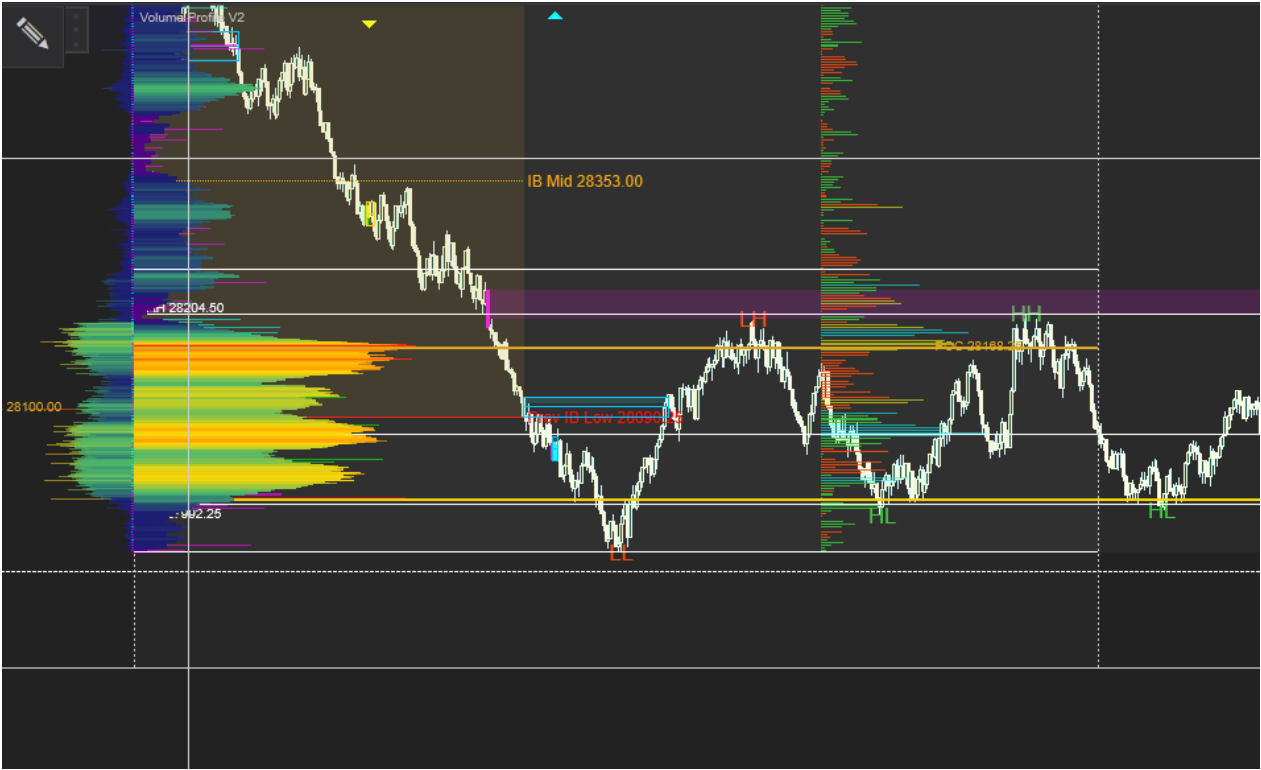


Figure 3. Profile structure and localized directional pressure used together for auction-context analysis.

9. Software Architecture

Layer	Responsibility
Observation	Receive and normalize market data while tracking feed, historical, and platform constraints.
Feature	Produce initiative, direction, persistence, location, and response features.
Context	Map features to session structure, balance, discovery, profiles, Initial Balance, and liquidity behavior.
Interpretation	Create states such as strengthening, weakening, absorption candidate, exhaustion candidate, and transfer candidate.
Visualization	Render oscillators, profiles, zones, price-level histograms, and diagnostics.
Strategy API	Expose validated snapshots and price references without coupling execution logic to rendering.

10. Research Applications

- Classifying whether initiative produces acceptance or rejection.
- Comparing True Aggression divergence with conventional cumulative-delta divergence.
- Testing whether origin-zone revisits differ from matched control areas.
- Testing whether aggression-by-price adds information beyond conventional volume profile.

- Conditioning outcomes by balance, discovery, session, volatility, and structural location.
- Supporting strategy research through stable, read-only analytics APIs.

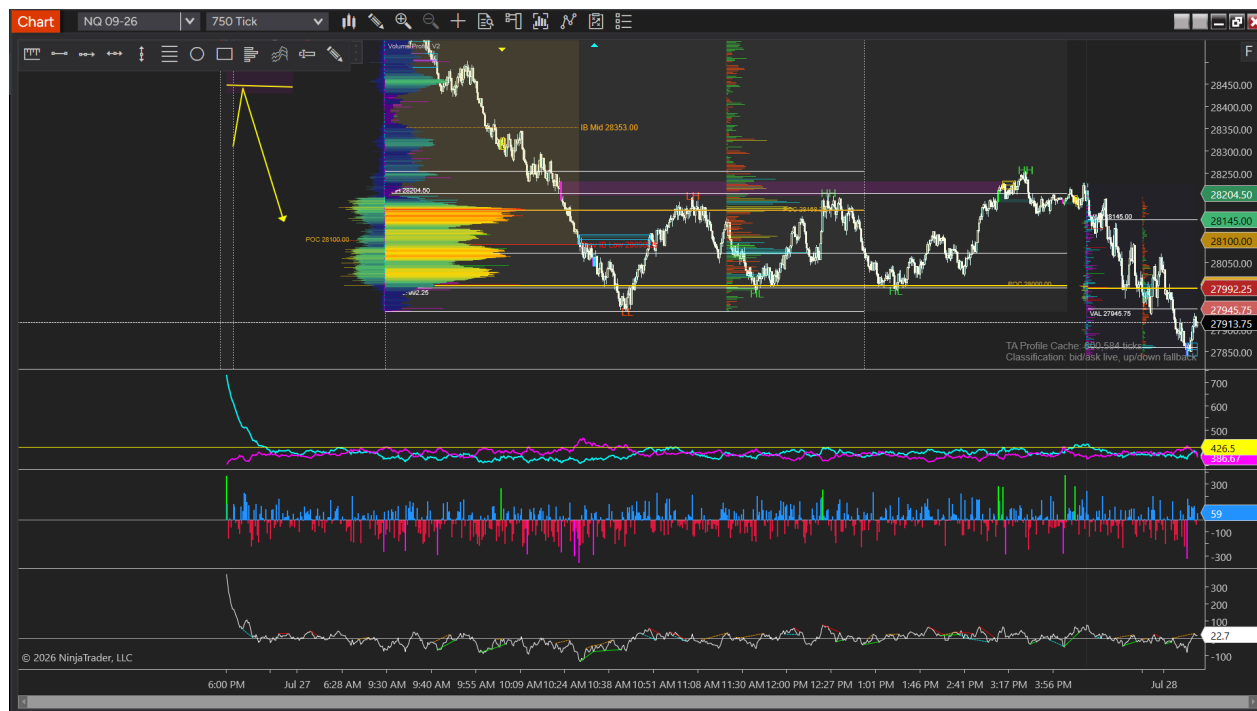


Figure 4. Integrated research workspace combining profiles, oscillators, and price-level analytics.

11. Evidence Standard

Selected screenshots demonstrate implementation and reasoning, not statistical edge. Every public case should identify the instrument, contract, date, session, chart construction, structural location, observed state, alternative explanation, invalidation, and outcome horizon. A credible evidence book must include failed and ambiguous examples in addition to visually successful cases.

12. Validation Program

- Freeze event definitions before testing.
- Compare against price-only, volume-only, delta, cumulative-delta, and volume-profile baselines.
- Use non-overlapping out-of-sample periods and more than one instrument.
- Separate real-time behavior from historical reconstruction.
- Evaluate sensitivity, ablation, calibration, and regime dependence.
- Include commissions, slippage, and implementation constraints whenever execution is evaluated.

13. Limitations

- Trade classification depends on data quality and platform behavior.
- Historical reconstruction may not reproduce real-time processing.
- Results may depend on instrument, session, volatility, and regime.
- Visual examples are vulnerable to selection and hindsight bias.
- Absorption, exhaustion, and participant identity remain inferred rather than directly observed.
- The framework does not provide guaranteed prediction or replace independent risk management.

14. Disclosure Boundary

Public	Reported selectively	Proprietary
Definitions, hypotheses, architecture, limitations, selected figures.	Aggregated validation results, robustness summaries, limited sensitivity analysis.	Exact formulas, smoothing, thresholds, weights, node ranking, zone construction, and execution logic.

15. Conclusion

The True Aggression Framework begins from a narrow proposition: price displacement requires initiative, but initiative alone does not explain the auction. Informational relevance emerges from the relationship among activity, liquidity, efficiency, persistence, location, and consequence. The framework should be judged by the clarity of its definitions, the rigor of its tests, and its incremental value over existing baselines - not by the visual appeal of its indicators or promotional claims.

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Author Note

Tarrell Allen is an independent C# trading-software developer and market-microstructure researcher. His work focuses on NinjaTrader analytics, initiative participation, liquidity behavior, volume profile, price-level pressure, and strategy-accessible software architecture. The Boy Prodigy Research is the publication identity used to organize this independent body of work.