Goldman Sachs

Discussion On Adapting A Tick Test For Today's Market

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Different "Tick Tests" On Different Venues

Exchange Listed Securities Tick Test - SEC Rule 10a-1 approved in 1938

- Covered exchange "listed" securities on trades reported to the tape
- Trade must be effected above last sale or at last sale if last sale was a "plus-tick"
- Last Sale price permitted to be calculated off of consolidated tape or on an exchange's own data

NASDAQ Market Bid Test - NASD Rule 3350 approved in 1994

- Covered NASDAQ National Market securities reported to ACT (NASD's TRF)
- Trade must be effected above last bid or at last bid if last bid was a "plus bid"
- Bid price permitted to be calculated separately by each trading center or market maker

Other, No Test - no restrictions on short sale trading

- Did not cover NASDAQ securities traded on exchanges on a UTP basis
- Did not cover NASDAQ Small Cap securities
- Did not cover Bulletin Board or Pink Sheet securities

Historically, there was no uniform tick test rule. We must decide how to adapt the "old rules" to today's market.

The Old Rules Required Many Exceptions

From the inception of Rule 10a-1 in 1938 through elimination of the old rules in 2007, numerous exemptions and exceptions were needed:

- 1938 – 39: Several exceptions were codified as part of Rule 10a-1 since its inception, including long seller's delay in delivery (e)(1), execution of an erroneously marked order(e)(2), odd lot transactions (e)(3) and (e)(4), the original equalizing exception (e)(6), bona fide domestic arbitrage (e)(7), international arbitrage (e)(8)
- 1974: Subsection (e)(10) adopted to exempt short sales by underwriters or syndicate members participating in a distribution in connection with an overallotment, and any lay-off sales by such a person in connection with a distribution of securities through rights or a standby underwriting commitment.
- 1980: Subsection (e)(5) and (e) (11) were adopted to update the equalizing exception - allowing certain market makers to equalize price notwithstanding the tick test for purposes of compliance with trade through rules and quoting obligations.
- 1984: Subsection (e)(13) was adopted to permit block positioners to offset part of the net short position.
- 1986: Merrill Lynch exemptive relief to allow for offset of net short positions for liquidation of index arbitrage positions.
- 1991 – 1999: Series of No Action Letters granting relief for electronic trading systems that match and execute trades at independently derived prices during random times within specific time intervals.
- 1993- 2001: SEC grants various fund sponsors exemptive relief for transactions in exchange traded funds (ETFs)
- 1994: NASD bid test is adopted in lieu of Rule 10a-1 and exemptive relief is granted for trades executed by qualified market makers in connection with bona fide market making
- 2000 – 2001: Series of No Action Letters granting relief for certain transactions executed on a volume-weighted average price ("VWAP") basis
- 2005: Exemptive relief granted to allow broker-dealers to fill customer orders, without the restrictions of the tick test for certain Riskless Principal transactions.
- 2006: Relief granted to allow the NASD to exempt securities included in the Nasdaq-100 Index.

If we reinstitute the old rules, many of the exemptions and exceptions will need to be restored and new ones may need to be added. Therefore, our goal should be to adopt a rule that is both protective and pragmatic for today's marketplace.

Market Structure Changes Timeline

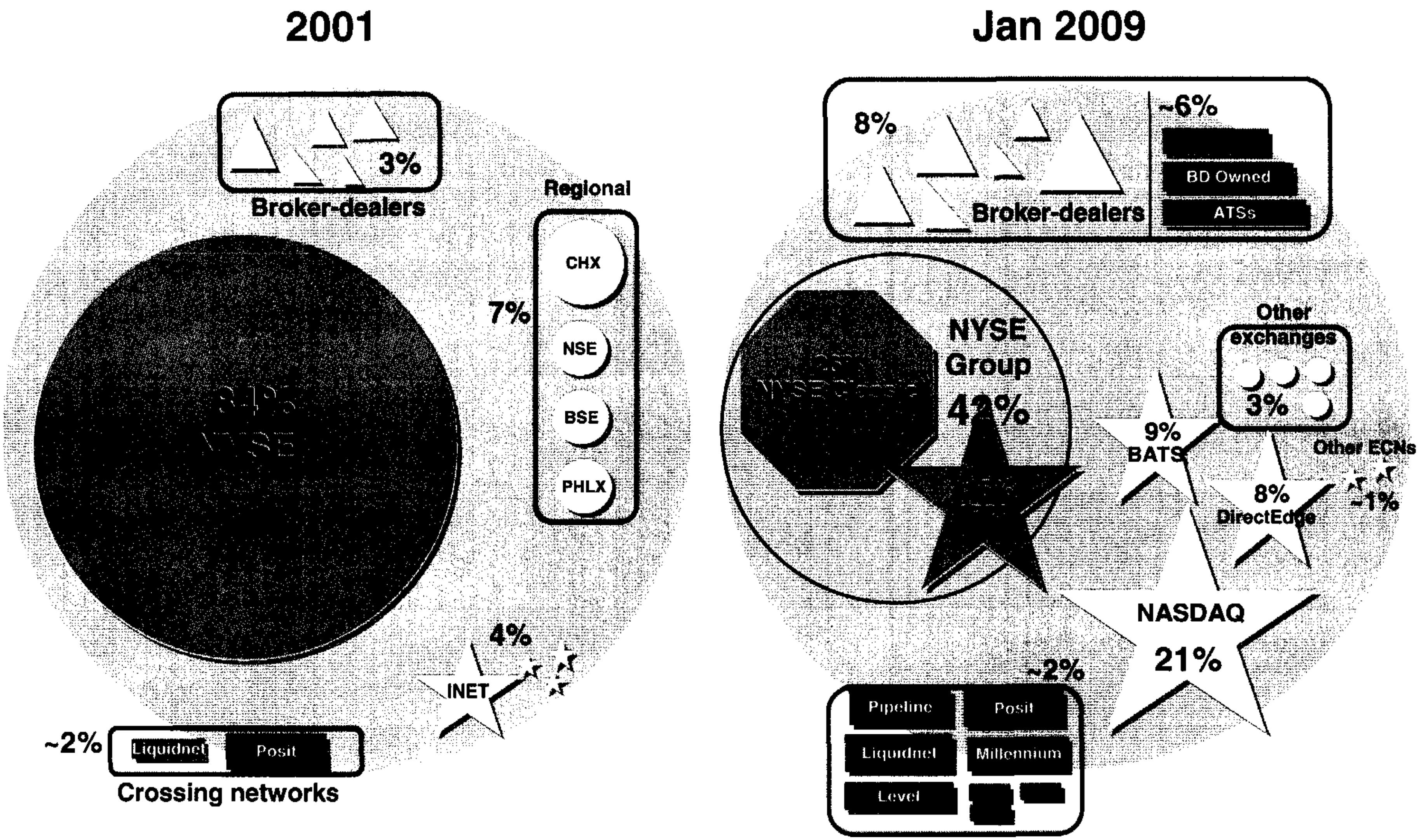
1999 2000 2001 2005 2006 **2007** 2008 2009

- 1999 – Reg ATS implemented defining out-loud and hidden order types
- 2001 – Penny pricing increments (aka Decimalization)
- 2005 – Reg SHO & tick test pilot implemented
- 2006 – NYSE becomes a for-profit exchange
- 2006 –NASDAQ splits from NASD as an exchange
- 2007 – Reg NMS and OPR implemented
- 2007 – Tick Test Eliminated

2008:

- Fragmentation increases
  - 10 exchanges
  - New ATSs
  - Undisplayed Liquidity
- Fast Markets
  - RegNMS set 1 second standard
  - Venues compete on sub second speed
- Algorithmic trading dominates flows
- "Liquidity providers" estimated to be > 50% of market volume
- 204T T+4 close out requirement strengthens Reg SHO

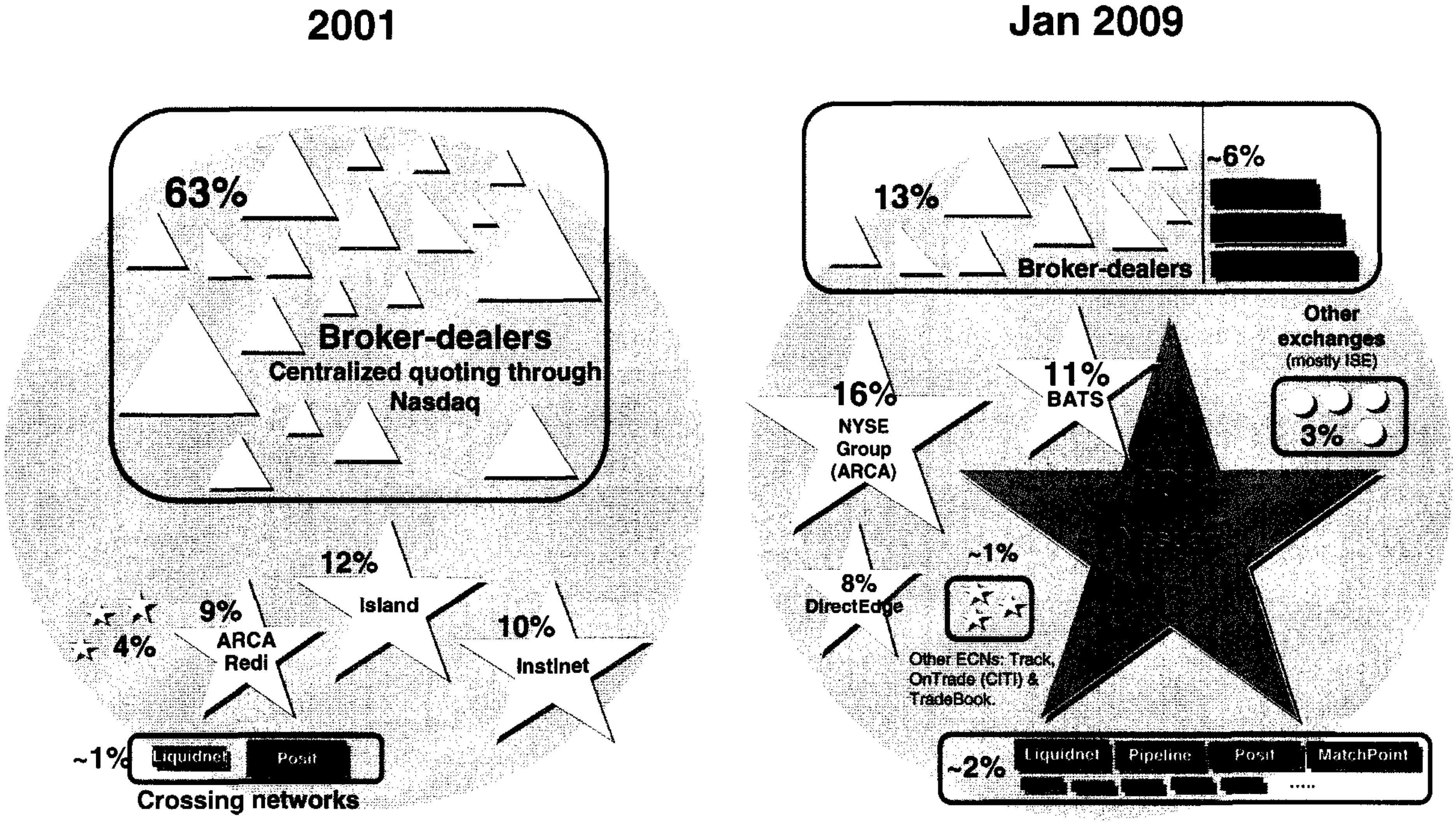
Distribution of trading volume: NYSE Listed Securities



=> Trading of NYSE Listed Securities has become more fragmented.

Note: Single-counted share volume, internal matches only, all Tape hours. For some venues the estimates are rough approximations. Shapes not in proportion to actual market share.

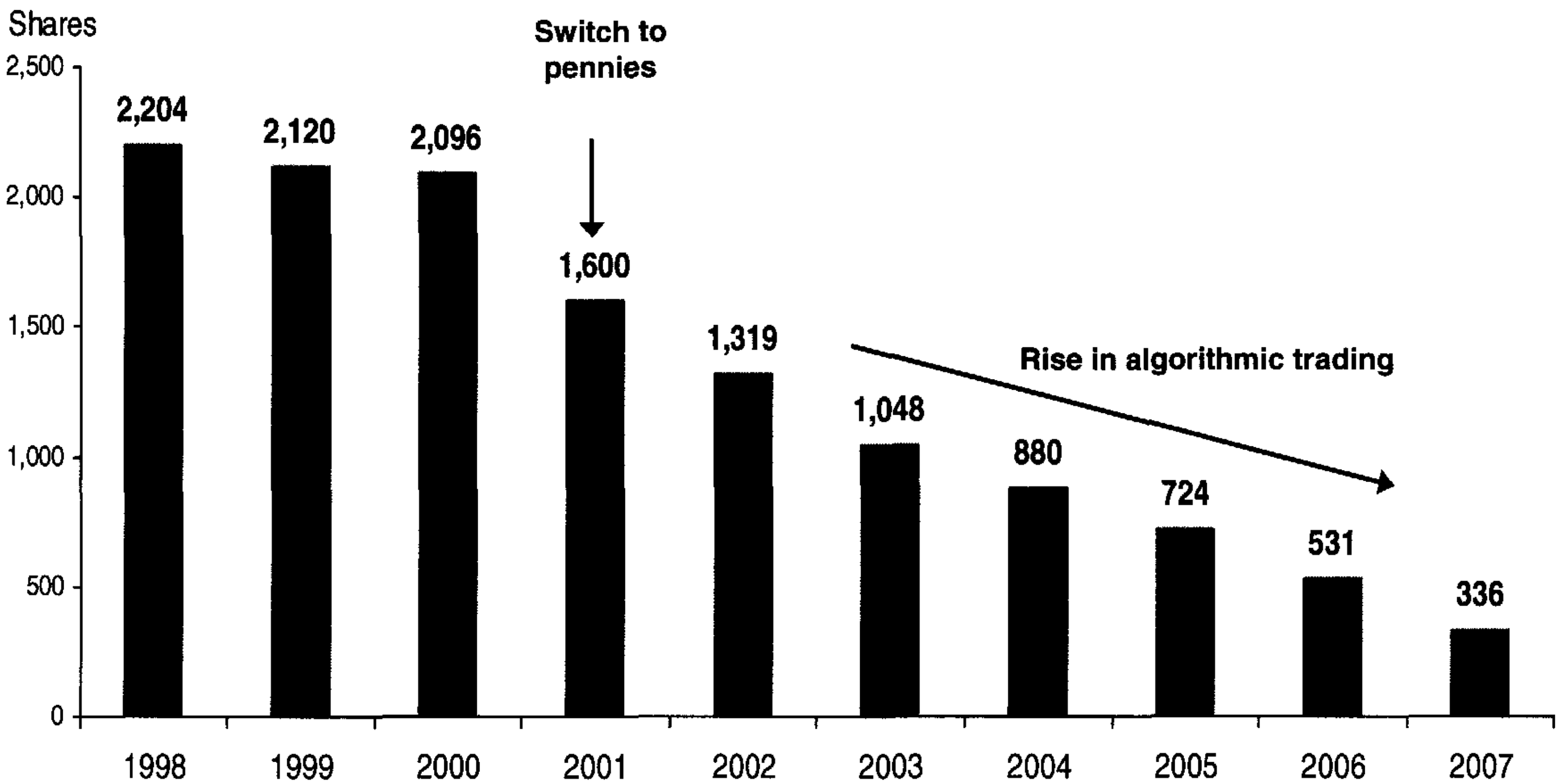
Distribution of trading volume: NASDAQ Listed Securities



=> NASDAQ has always been fragmented

Note: Single-counted share volume, internal matches only, all Tape hours. For some venues the estimates are rough approximations. Shapes not in proportion to actual market share.

The decline in trade size on the NYSE



Source: ratio of consolidated. volume to trades (prints) – NYSE websites. Ratios prior to Jan '01 are adjusted for the change in NYSE reporting of total trades.

Adapting Old Rules To Today's Market

The markets desire a new and more effective rule to combat potential manipulative short selling, increase market confidence and ensure that the U.S. capital markets are globally competitive - a solution for the 21st century in a post Regulation NMS world.[1,2]

In order to be most effective, we believe that any new pricing restriction rule should serve two basic fundamental goals:

- The rule must be designed to filter false positives, meaning that it is triggered at times when the market is most vulnerable to potential manipulative short selling - but not when normal market conditions prevail.
- The rule must be effective and updated for the current market structure, simple to enforce, and quick to implement.

[1] Post implementation of Regulation NMS, markets have become "fast" and market participants are required to maintain best bid or offer ("BBO") data to comply with trade through restrictions and best execution obligations. This BBO data can be leveraged to quickly implement a bid test requirement.

[2] We do not think a last tick test is implementable in a post Regulation NMS world across multiple venues. However a bid test is possible if we leverage the Regulation NMS data already required.

Proposal for Enhanced Tick Test ("Modified Uptick Rule")

Stock
Live Public Venue Test

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Objective % Move
Circuit Breaker Test

$$\left(1 - \frac{\text{BBO Offer}}{\text{Previous Day Close}}\right) > 5 - 15\%$$

(based on share price)

- Stocks which have hit the trigger to be published by exchanges
- The recommended range is 5 - 15% and should vary with stock price
- The percentage move could be calculated from current day open to avoid triggering based on pre-open news
- Prevents unintended loss of liquidity provider function in normal markets

If test is TRUE, then...

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Pricing Restriction Triggered
(three possibilities – ranked from most to least protective)

a) Ban on Short Selling
b) Ban on Hitting Bids ("Modified Uptick Rule")
c) Plus Bid Test

- Choice of restriction depending on behavior the SEC is attempting to deter
- "Cool-down" period can last from an hour to multiple days depending on the restriction
- Restrictions could be effective intraday or next day. Halting stocks may be necessary if intraday restrictions apply
- The data is calculated from existing "Protected Bid/Offer," as defined by Regulation NMS
- Exemptions will be needed for participants who are engaged in market making, upstairs customer facilitation and delta neutral hedging strategies

Simplified Categories of Market Exemptions to Preserve Liquidity

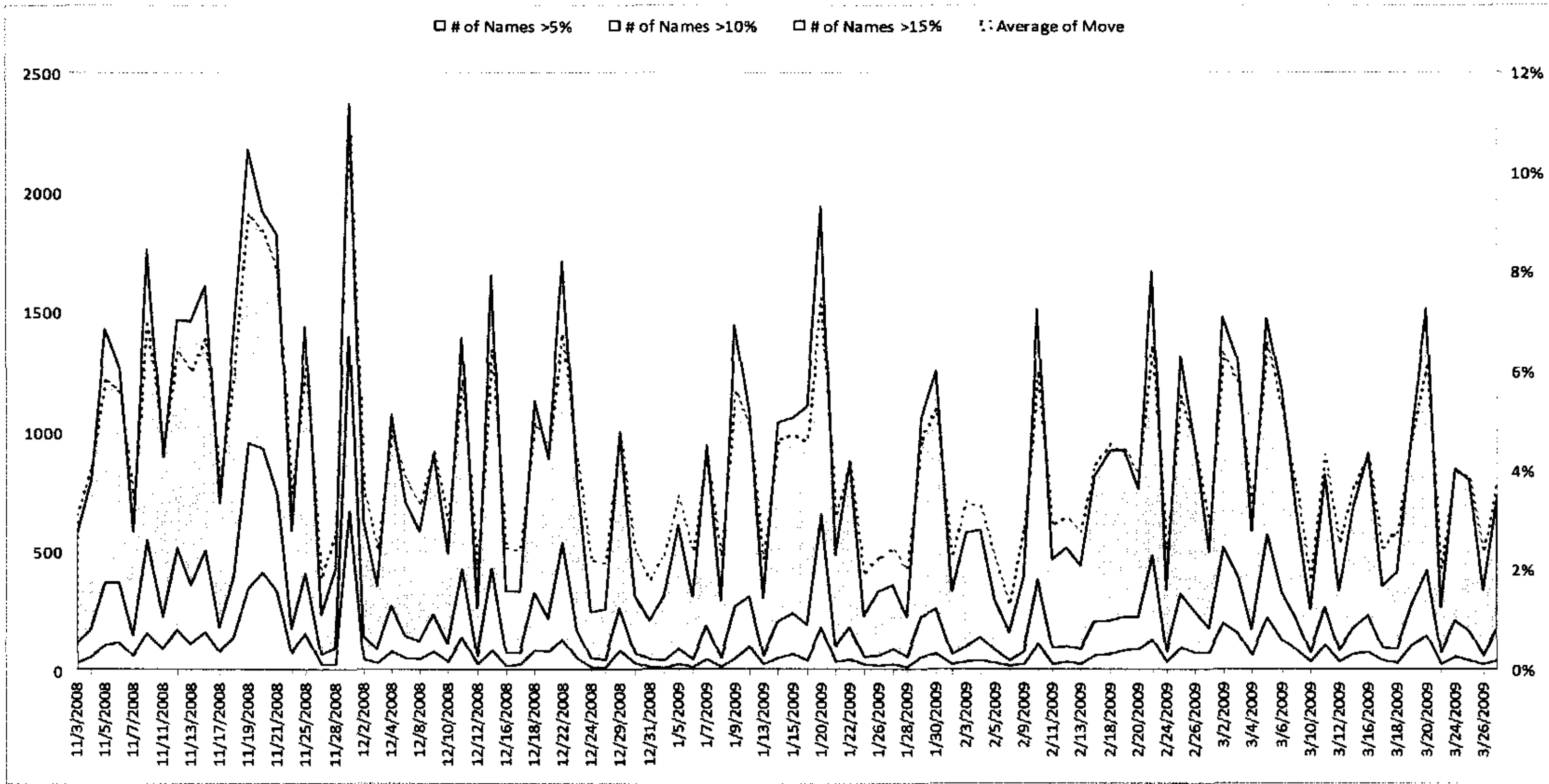
Market Participant/ Activity	What are the Qualifying Criteria?	For Use By	Rationale
Market Makers: a) Exchange-based Market Makers b) OTC Market Makers	a) Liquidity providers w/ express market obligations by virtue of registration, e.g., affirmative obligation b) Registered broker-dealers that provide two-way markets and source liquidity in derivatives products to their client base	a) NYSE Specialists, primary market makers incl. registered MMs, DPM and LMMs (Listed Options), and secondary liquidity providers e.g., NYSE SLPs b) OTC Derivatives dealers, including options, structured products, equity swaps and convertibles	a) Restrictions on hedging will impede provision of liquidity b) Inability to hedge will trigger ISDA provisions, cause unwinds w/increased volatility and cost to clients; dealers will be reluctant to establish new positions diminishing liquidity
Upstairs Customer Facilitation	Broker-dealers that provide two-way markets and liquidity in stock, ETFs, baskets and programs to their customers	Traditional block desks and other customer facilitation such as ETF, program trading and exchange-listed derivatives facilitation	Restrictions will impair dealers' provision of liquidity to their customer base – reducing an additional source of liquidity
Delta Neutral Hedging Strategies	Any market participant hedging equity exposure, as measured by a recognized industry model like Black-Scholes.	Registered broker-dealers, investment advisers or other participants, who submit to SEC inspection through certification/ filings	Inability to hedge will destroy investment strategies that are beneficial to the market such as convertible arbitrage, which will harm companies' ability to raise capital through the issuance of convertibles

Appendix

Appendix 1 - What's Changed in the Markets?

Old Environment	Current	Implications for Old Tick Test Rule
Minimum Price Increment = 5¢	Minimum Price Increment = 1¢ (a.k.a. Decimalization)	Increased "Quote Flickering". Up-Tick or Up-Bid is not as economically meaningful. Easier to game by creating artificial Up-Tick or Up-Bid.
Multiple tick or bid test rules to comply with, depending on which security and where it was traded. NASDAQ Securities traded OTC as part of NASD	NASDAQ became an exchange and it's securities are now considered "Listed", but still traded under old NASD bid test rule.	Multiple rules on different set of securities is problematic.
Old Trade-Through Rule	Unified set of short sale regulation for all markets due to Reg SHO and Reg NMS, including the new Order Protection Rule (OPR).	Reg NMS dictates that each market center must check its trades versus the best bid/offer that they "see", so there is no one place to determine an up or down bid/tick.
80-90% of "listed" volume on NYSE	10 Exchanges and no one has more than 40% of the volume. Smart Order Routers split order to multiple venues.	Ability exists to "create" an uptick on multiple venues. Sequencing and Ordering is problematic as each venue has different "view" of the market data.
Exchange Quotes sent out on one universal price feed. There is a Single TRF(ACT) for off-exchange volume reporting.	Each major exchange has its own data feed. We now have Multiple TRFs.	Each market participant will calculate the up-tick or up-bid in a different way using different data feeds. Sequencing and Ordering the prints will be problematic across venues.
Mutualized Exchanges with Market Data Revenue going towards supporting regulation cost.	For-Profit Exchanges with Market Data Revenue a key driver of profits.	Many different forms of exchanges "selling" market data (e.g. top-of-book vs. depth-of-book, full feed vs. "skipped" or aggregated ticks).
Mostly human trading decisions	Mostly electronic and Algorithmic trading decisions with high frequency trading "co-located" in Exchange data centers.	Speed advantage enables "flashing" of an up-bid. Trading occurs on market data that is seconds ahead of "official" published NBBO.
Order "turn-around" time measured in multiple seconds	Order "turn-around" time measured in micro seconds (pico?)	Flickering Quotes and timing mismatches will make surveillance and monitoring difficult if not impossible
Most Bids/Offers are "out-loud" and displayed in market data systems.	"Hidden" order types abound and most liquidity is not quoted "out-loud".	Trading inside the bid/offer now occurs frequently and often at sub-penny prices.
Handful of ETFs on broad stock indices	Over 800 ETFs accounting for over 20% of the trading volume. Some ETFs don't even have stock underliers.	Will need to update the definitions for exempt activity.
Varying definitions of exempt activity	We now have ATSs, SLPs, DMMs, Positioners/Facilitators	Will need to update the definitions for exempt activity.

Appendix 2 – Symbols per day 5%, 10%, and 15% below the open Based on Russell 3000 Tickers



	Count	Average Number per Day % Down vs. Open		
		5%	10%	15%
Symbols >= $10	1799	346	54	11
Symbols < 10	1089	499	180	67
All Symbols	2888	845	234	78