RESEARCH

Insights

# Primer: Equities

## Analyzing Market Metrics and Fundamentals of Markets

**September 2024**

### SIFMA Insights Primers

The primer series from SIFMA Insights breaks down important technical and regulatory nuances. By fostering an understanding of the marketplace, we set the scene to address complex issues arising in today's markets. The primer series can be found here: www.sifma.org/primers

In addition to this primer, the series includes the following reports: Capital Markets, Global Equity Markets Comparison, Capital Formation and Listings Exchanges, Options, Exchange-Traded Funds (ETF), and Fixed Income Markets and Electronic Trading.

**In this primer**: We analyze equity market structure. Equity volumes remained elevated to historical levels at 11.0 billion shares on average in 2023, but down to the prior year by 7.1%. This report looks at drivers of volumes, including volatility, interest rates, retail trading, and passive investing. It then looks at the evolution of the market landscape, previously dominated by a few but now multiple trading venues (16 exchanges, >30 ATS, >200 OTC venues). The report diagrams order routing, from investor to execution. It also recaps regulations and historical market events.

# Contents

Executive Summary ..... 4
Market Metrics ..... 6
Drivers of Market Volumes ..... 8
Volatility ..... 9
Realized Versus Implied Volatility ..... 10
VIX and the Fed Funds Rate ..... 11
Growth in Retail Trading ..... 12
Growth in Passive Investing ..... 14
Evolution of the Market Landscape ..... 16
Previously Dominated by a Few… ..... 16
…Now Multiple Trading Venues ..... 17
Exchange Landscape ..... 18
Exchange Market Shares ..... 19
Alternative Trading Systems (ATS) ..... 21
Volume Concentration ..... 22
Decreased Trade Size ..... 23
Order Routing ..... 24
From Investor to Execution ..... 24
Equity Market Regulations ..... 32
Securities Act of 1933 ..... 32
Securities Exchange Act of 1934 ..... 32
Maloney Act Amendments of 1938 ..... 33
Securities Act Amendments of 1975 ..... 33
Order Handling Rules (1997) ..... 34
Regulation Alternative Trading Systems (Reg ATS, 1998) ..... 34
Decimalization (2000) ..... 35
Regulation National Market System (Reg NMS, 2005) ..... 35
Rule 613: Consolidated Audit Trail (CAT, 2012) ..... 37
Measures to Adress Market Volatility (2012) ..... 38
Regulation Systems Compliance and Integrity (Reg SCI, 2014) ..... 39
Pilots to Assess Potential Changes ..... 40
Roundtables to Discuss Potential Changes ..... 41
Equity Market Structure Reform (2022) ..... 42
History of US Stock Exchanges and Market Events ..... 45

Appendix: Capital Markets Terms to Know ........ 53
SIFMA Insights Research Reports ........ 58
Author ........ 59

# Executive Summary

The U.S. equity markets continue to be among the deepest, most liquid, and most efficient in the world, with investors enjoying narrow spreads, low transaction costs, and fast execution speeds. There is also plenty of opportunity for price improvement, especially for retail investors. That said, one can always strive to improve. Efficient and resilient market structure is key to sustaining investor confidence and participation underpinning the equity markets. The goal of regulators and market participants is to promote market resiliency and ensure the U.S. equity markets continue to benefit investors and play an essential role in capital formation. This primer reviews equity market metrics, market structure, and regulations.

**Volume metrics:** Equity volumes remained elevated to historical levels at 11.0 billion shares on average in 2023, but down to the prior year by 7.1%. The overall trendline for equity volumes was essentially flat. Volumes saw some spikes upward throughout the year, but with very few sharp downward points.

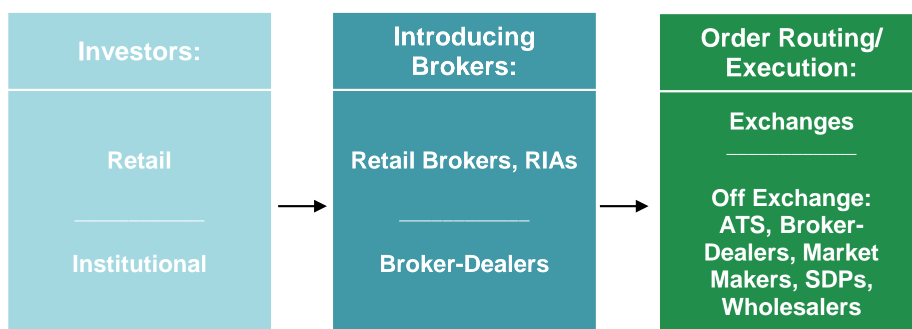
**Volume drivers:** Volume is the number of shares traded, indicating the overall activity of a security – or the market in aggregate – over a specified period of time. Common drivers of equity trading volumes include:

- Volatility – Volatility settled back down in 2023, closer to historical levels (15.39 in 2019), at 16.85 on average, -34.3% Y/Y. The overall trendline for the VIX in 2023 was sharply downward sloping. This down trend continued throughout the year, with December representing the lowest month at 12.72.
- Realized volatility – An additional factor to look at is implied versus realized volatility. While implied volatility refers to the market's assessment of future volatility, realized volatility measures what actually happened. For 2023, realized to implied volatility averaged 107.2%, with expectations nearly in line with actual results.
- Interest rates – The VIX tends to rise and fall with interest rate cycles. With a steady, continual rise in rates, the VIX historically increases after a lag period, and vice versa when rates fall. For 2023, the VIX and the Fed Funds rate showed an almost perfect negative correlation at -0.98.
- Retail investing – Another driver of equity volumes has been the growth in retail investing. Based on Bloomberg Intelligence data, retail as a percent of total market volumes was estimated at 18.0% in 2023, with retail participation having settled around this level for the last two years. SIFMA's market structure survey estimated the level of retail volumes to be in the 20%-30% range (for the past two annual surveys).
- Passive investing – ETF volumes remained elevated to historical levels but came down from last year, 2.3 billion shares on average (-13.8% Y/Y). The overall trendline for ETF volumes in 2023 was essentially flat, with its spike – and peak level – in the first half of the year and a few more spikes upward later in the year. The ETF Y/Y volume decline compares to -5.1% for single stocks and -7.1% for total equities. ETF volumes as a percent of total equity market volumes were 20.4%.

**Market landscape:** The equity market landscape was previously dominated by a few exchanges – NYSE and Nasdaq – particularly in trading of their own listed stocks. It has been estimated that in the early 1990s NYSE held ~90% share of trading in its own listed stocks and Nasdaq ~100% of its own listed stocks. Today, we have 16 exchanges, predominantly under three main parent groups, over 30 equity alternative trading systems (ATS), and over 200 over-the-counter (OTC) venues. With this increase in competition, volumes became concentrated around the closing auctions at NYSE and Nasdaq. NYSE indicates its closing auction represents around 7% of total NYSE-listed volume – growing to over 20% on major trading days – as market participants choose to participate at the time

when the maximum number of buyers and sellers come together. This congregation of volumes at the close and to a lesser extent the open is known as the smile curve (albeit a lopsided smile). We also saw the average trade size come down. In the 1990s, the average trade size was in the thousands, falling but remaining high into the early 2000s. Trade size settled into the low hundreds after that. This fell to 165 in 2023, averaging 158 over the last three years.

**Order routing:** This report also reviews the concept of order routing, or how an order goes from investor to execution. Once an investor places a trade, the order goes to a broker. If the order is marketable, it is eligible for immediate execution based on current market conditions. Non-marketable orders are not immediately executable for various reasons, for example: the limit price is outside the current market; or, for institutional orders, it was an all or none trade and the quantity is not available in the market. The broker will look at the size of the order and the prevailing market price to determine the path that will achieve best execution. The equity order routing process is complex, but we provide a general description as:




Note: ATS= alternative trading system; SDP = single-dealer platform. RIA = registered investment advisor. RIAs have the option to route through their clearing firm or manage their own order flow. Most prefer the former given cost constraints and the added regulatory and compliance burdens. That said, they are still responsible for best execution and any regulatory reporting/disclosures (ex: Rule 605).

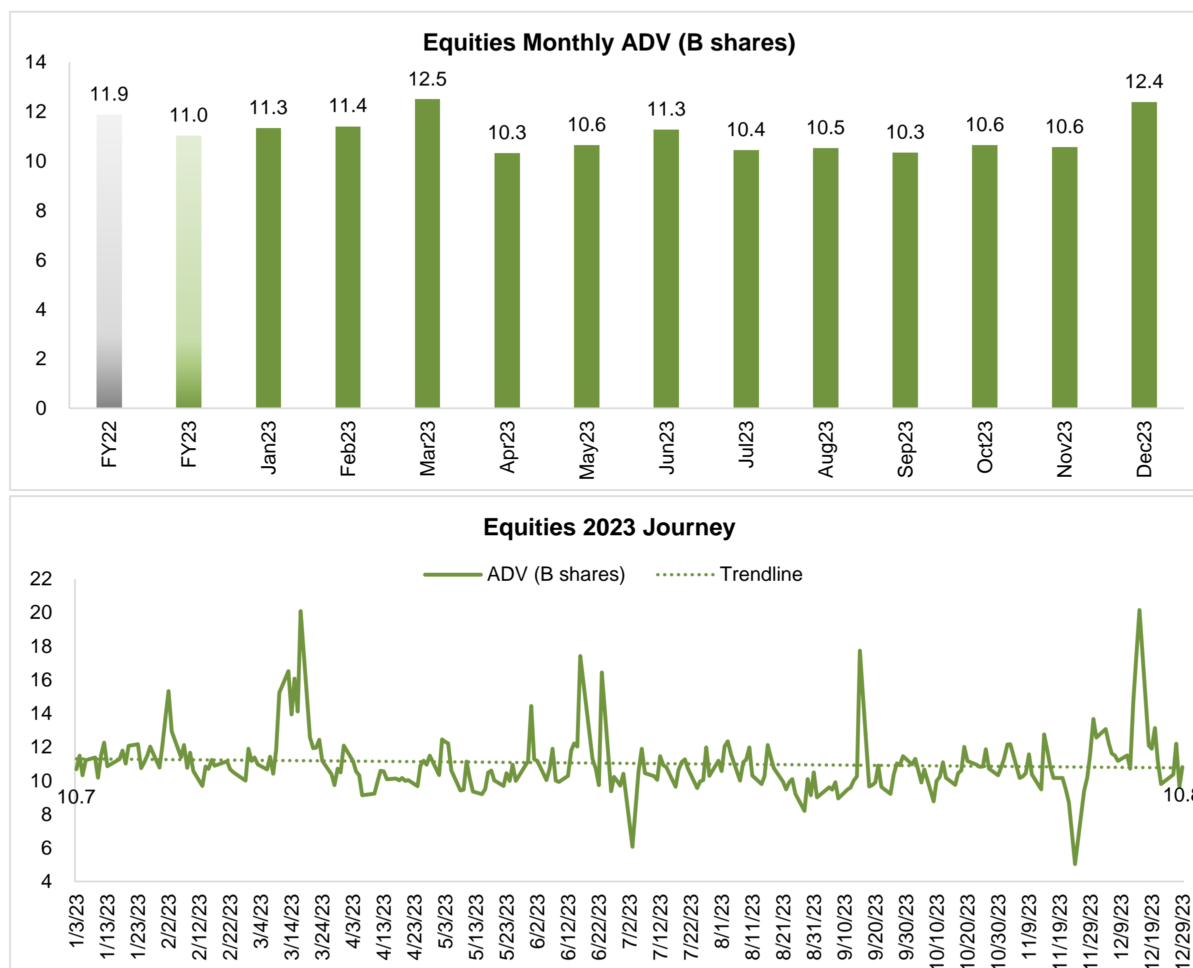
**Other:** This report finishes with a review of regulations – including the latest equity market structure proposals/rules announced in 2022 and beyond – and historical market events.

# Market Metrics

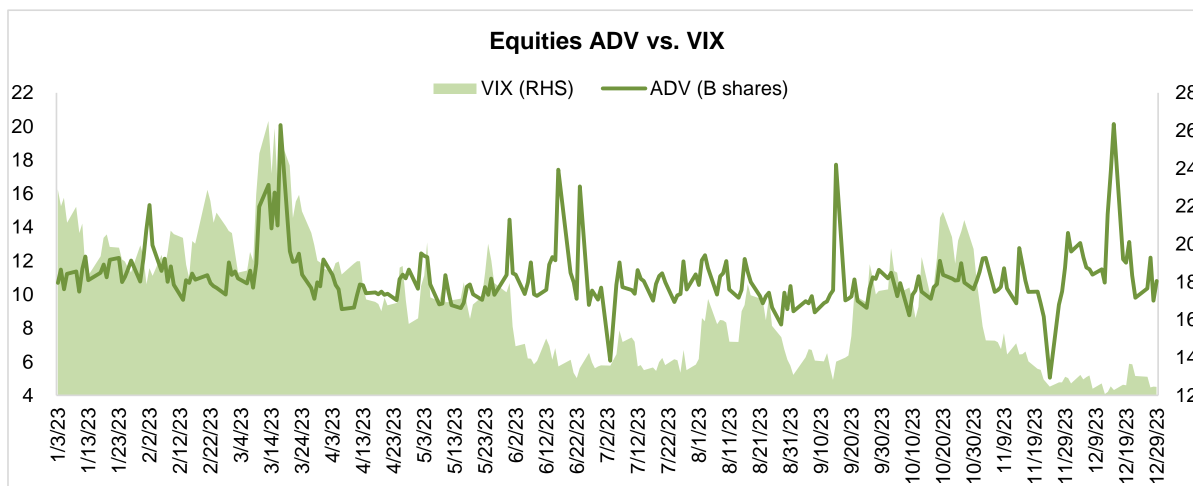
Equity volumes remained elevated to historical levels at 11.0 billion shares on average in 2023, but down to the prior year by 7.1%. The overall trendline for equity volumes was essentially flat. Volumes saw some spikes throughout the year, but with very few sharp downward points.

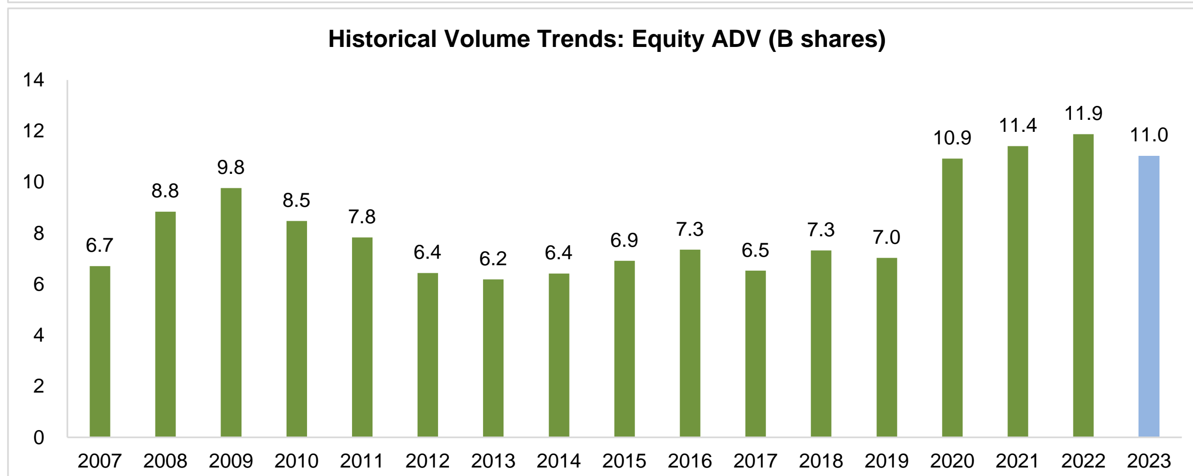
We highlight the following trends for 2023:

- Average 11.0 billion shares
    - -7.1% Y/Y
    - Peak 20.2 billion shares on December 15
    - Trough 8.2 billion shares on August 28 (excludes half trading days)
- 5-year CAGR +8.6%
- 10-year CAGR +6.0%




Source: Cboe Global Markets, SIFMA estimates




Source: Cboe Global Markets, Bloomberg, SIFMA estimates

## Drivers of Market Volumes

Volume is the number of shares traded[1], indicating the overall activity of a security – or the market in aggregate – over a specified period of time. For investors, volumes can be used as a technical indicator[2] to identify a trend or reversal, signaling when to buy or sell a stock. For example, a stock continuing an upward run should see volumes move similarly. On aggregate, up markets are an indicator of investors' views of confidence in or a sign of a strong U.S. economy, i.e. companies are performing well.

In this section, we look at the drivers of equity trading volumes.

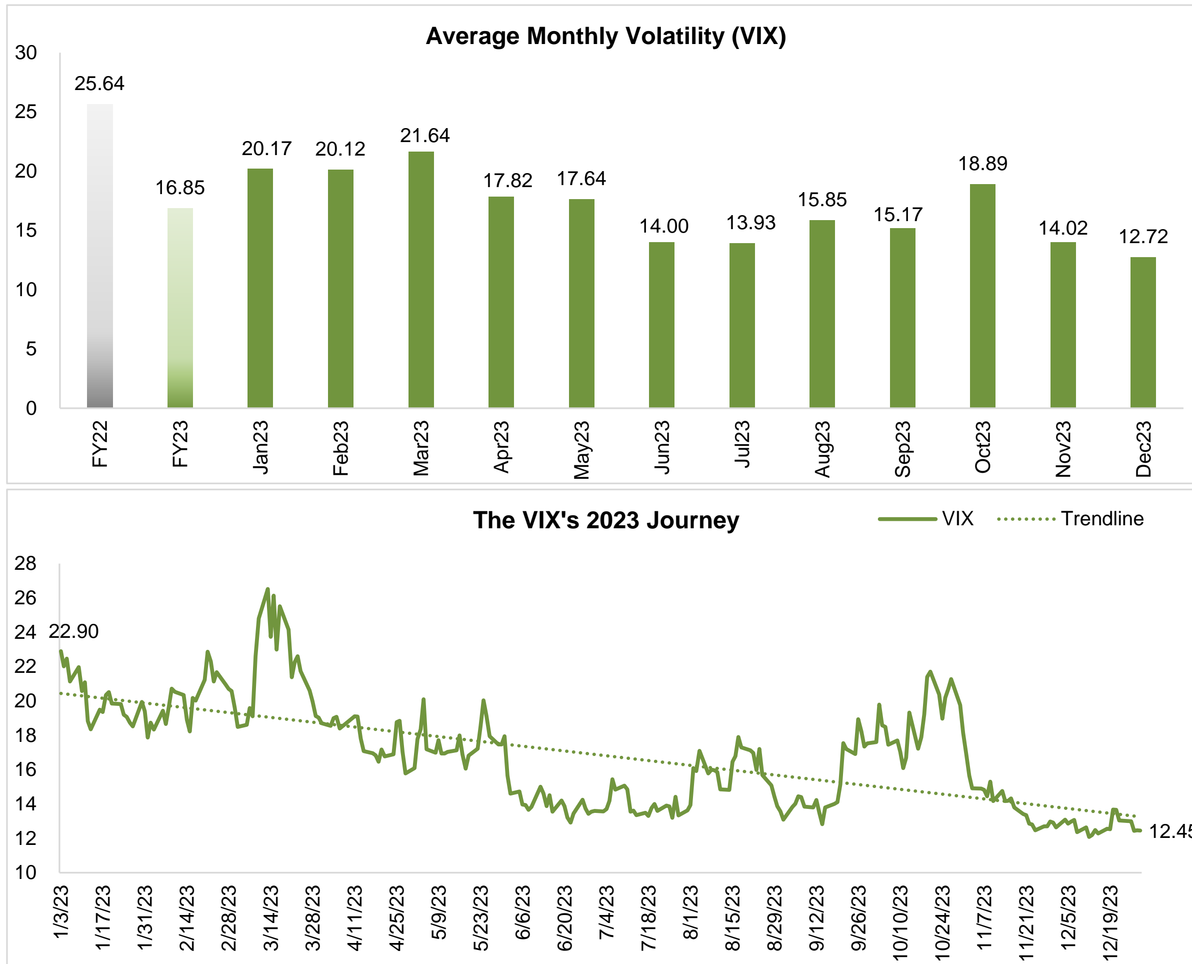
[1] In the U.S., volume is typically noted in shares. Other countries/regions use notional value for volumes.
[2] Analysts and investors also use fundamental analysis of companies to make investment decisions.

## Volatility

Volatility is a main driver of equity volumes. Volatility settled back down in 2023, closer to historical levels (15.39 in 2019), at 16.85 on average, -34.3% Y/Y. The overall trendline for the VIX in 2023 was sharply downward sloping. This down trend continued throughout the year, with December representing the lowest month at 12.72.

We highlight the following trends for 2023:

- Average 16.85
  - -34.3% Y/Y
  - Peak 26.52 on March 13
  - Trough 12.07 on December 12
- 5-Year CAGR +0.3%
- 10-Year CAGR +1.7%

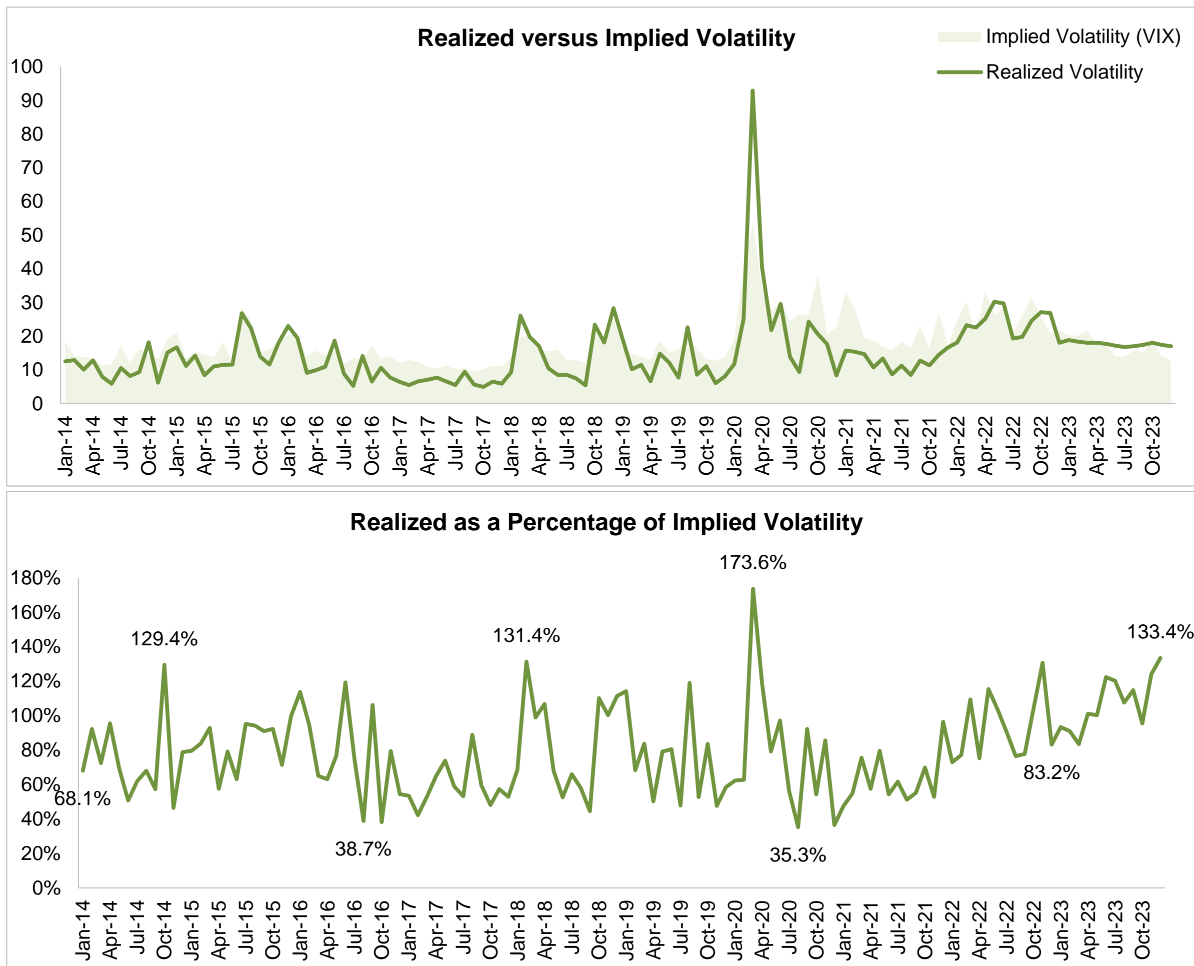



Source: Bloomberg, SIFMA estimates

## Realized Versus Implied Volatility

An additional factor to look at is implied versus realized volatility. The VIX, or the Cboe Volatility Index, shows the market's expectations of 30-day volatility. It is a forward looking indicator of market risk, constructed from implied volatilities on S&P 500 index options, both puts and calls. It is often referred to as the investor fear gauge. As the market in aggregate is typically considered to be long the S&P 500 and risk averse, a rise in the VIX implies increased fear, or increasing market risk or stress.

While implied volatility refers to the market's assessment of future volatility, realized volatility measures what actually happened. Since 2014, realized as a percent of implied volatility averaged 79.5%, as actual volatility came in below expectations (implied volatility). This gap is referred to as the volatility risk premium. This ratio peaked at 173.6% in March 2020 – realized volatility significantly outpaced expectations as the global pandemic caught markets by surprise – with the trough of 35.3% in August of the same year, indicating lingering market concerns about the future were outpacing actual market volatility. For 2023, realized to implied volatility averaged 107.2%, with expectations nearly in line with actual results.

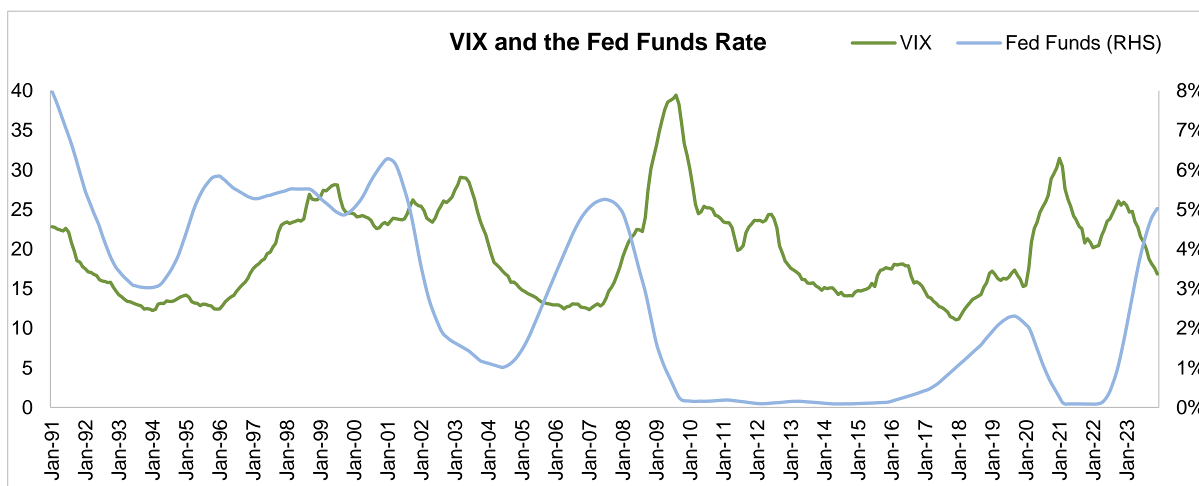


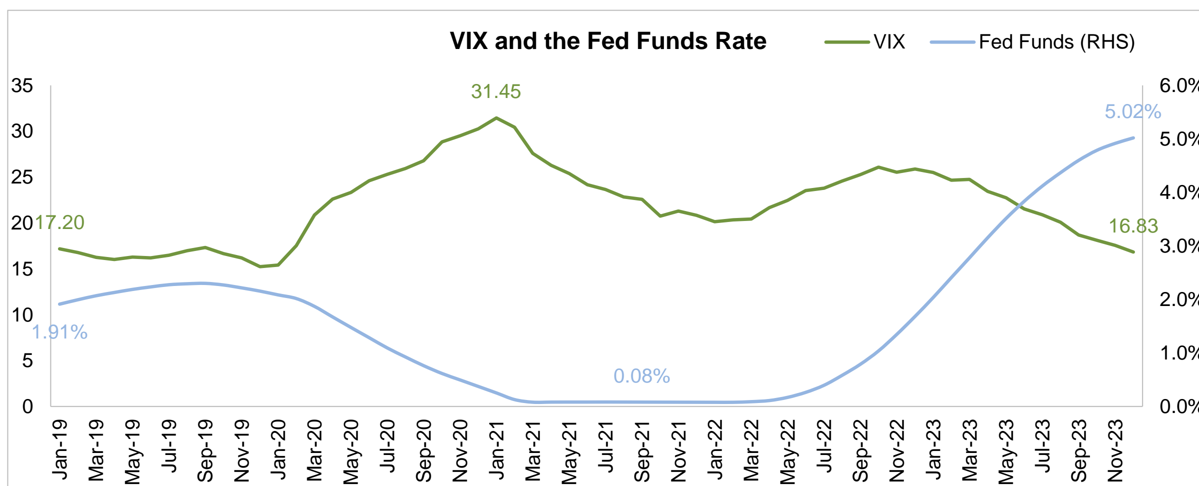

Source: Bloomberg, SIFMA estimates

## VIX and the Fed Funds Rate

Additionally, the VIX tends to rise and fall with interest rate cycles. With a steady, continual rise in rates, the VIX historically increases after a lag period, and vice versa when rates fall. We note that ceteris paribus holds, or all else being equal. The determinant effect of one economic variable on another is dependent on all other variables remaining constant. Therefore, outliers exists, such as: the global financial crisis in 2008/2009, COVID in spring 2020, or the meme stock impact in early 2021.

For 2023, the VIX and the Fed Funds rate showed an almost perfect negative correlation at -0.98.



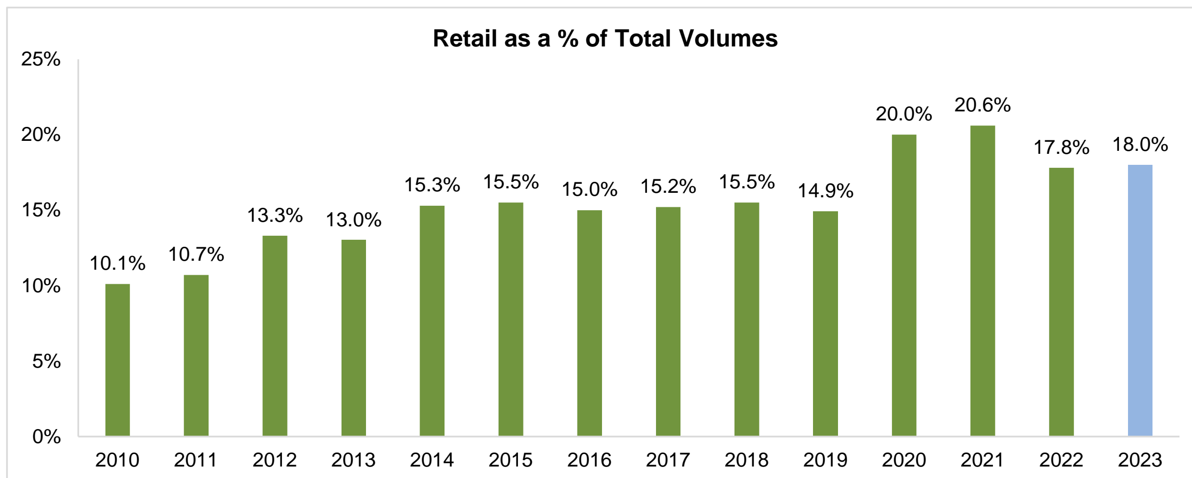

Source: Bloomberg, SIFMA estimates

## Growth in Retail Trading

Another driver of equity volumes has been the growth in retail investing. Historically, retail represented around 10% of total volumes. The chart below shows the increase in participation during COVID – carrying over into the following year – inclusive of the meme stock time period. Retail as a percent of total market volumes was estimated at 18.0% in 2023, with retail participation having settled around this level for the last two years.

We note that this figure might be on the low side, given data collection methodology. The data is pulled from Bloomberg Intelligence, which gathered data from the SEC Rule 605 and 606 reports. However, on the 606 side, the volume data does not include several large brokers with a retail business that do not accept PFOF. This, therefore, understates the level of retail. To compensate, 605 numbers are included from wholesale market makers. This slightly overstates retail. Bloomberg Intelligence estimates retail is between the numbers you get from 606 reports and 605 reports, closer to 605.

We also note that SIFMA's annual market structure survey – participants include members of SIFMA's equity and options trading committees, exchanges, and other market participants – estimated that the level of retail volumes is in the 20%-30% range (for the past two surveys).




Source: Bloomberg Intelligence, SIFMA estimates

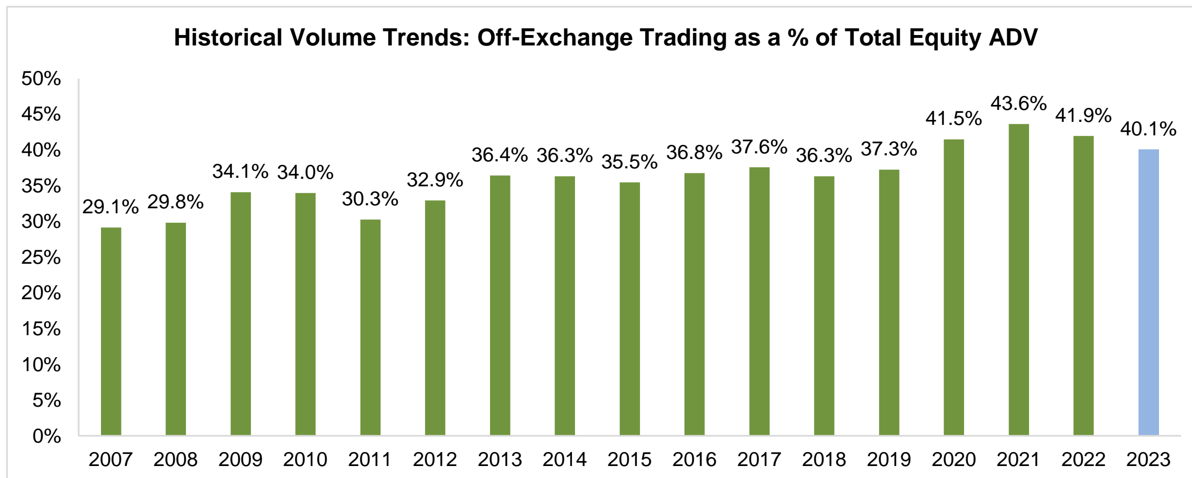
## Off-Exchange Trading

Some people have mistakenly looked to off exchange trading[3] data to build a proxy for retail participation. This would overstate the percent of retail trading. The percentage of off-exchange trading in any given time period is a function of market fundamentals at that time, such as retail participation, volatility levels (volumes typically move back on exchange during volatile times), institutional flow on alternative trading systems (ATS), capital commitments, and other factors.

The growth in off-exchange trading over the past few years has been attributed to the growth in retail investing. Most retail flow has generally been executed off exchange, except for limit orders which are sent to exchanges. Retail brokerages – who route order flow based on who will provide the best execution quality, which includes price and/or size improvement for their clients' trades – may send retail order flow to market makers, who then execute some of the orders off exchange[4]. As retail investor trading has grown as a percentage of overall volume, it is logical that off-exchange volume grew as well. You saw the increase in off-exchange trading begin after 2019, when retail brokerages reduced commissions to $0. The level peaked in 2021, settling in the low 40s in 2023, versus the mid to high 30s seen prior to this growth period.

However, not all off-exchange trading is retail. For 2023, FINRA data showed total volumes were broken out across exchange 57.1% and off exchange 42.9%. Off exchange is broken out into alternative trading systems at 13.1% and non-alternative trading systems at 29.8%. Off exchange is where retail trades would be recorded, as well as other flows. For example, block trades are executed off exchange, estimated at around 10%.

In other words, off-exchange flow is more diverse than only wholesalers executing retail trades.




Source: Cboe Global Markets, SIFMA estimates

[3] Orders executed off exchange are immediately reported to the Trade Reporting Facilities (TRF), i.e. to the tape, to help facilitate price discovery.
[4] In accordance with order handling rules, limit orders are displayed on exchange.

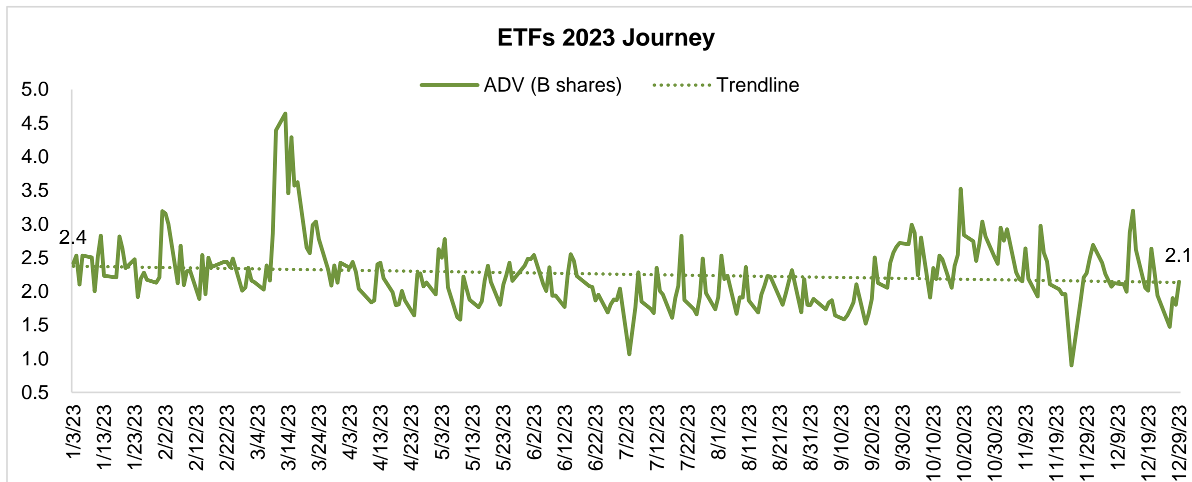
## Growth in Passive Investing

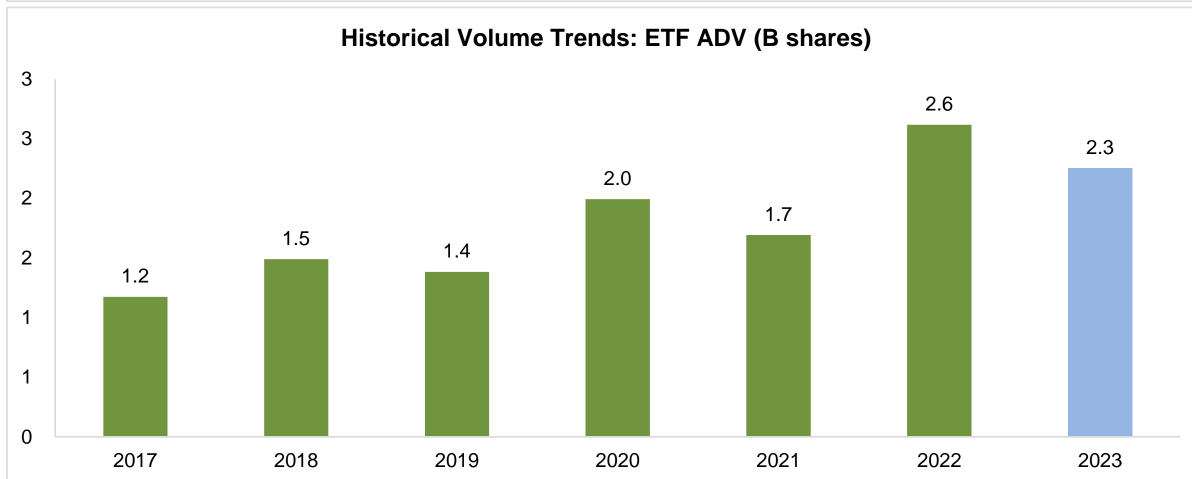
ETF volumes remained elevated to historical levels but came down from last year, 2.3 billion shares on average (13.8% Y/Y). The overall trendline for ETF volumes in 2023 was essentially flat, with its spike – and peak level – in the first half of the year and a few more spikes upward later in the year. ETF volumes as a percent of total equity market volumes were 20.4%.

### ETF Volumes

We highlight the following trends:

- 2023 average 2.3 billion shares
  - -13.8% Y/Y
  - Peak 4.6 billion shares on March 13
  - Trough 1.5 billion shares on December 26 (the day after Christmas; excludes half trading days)
- 5-Year CAGR +8.6%



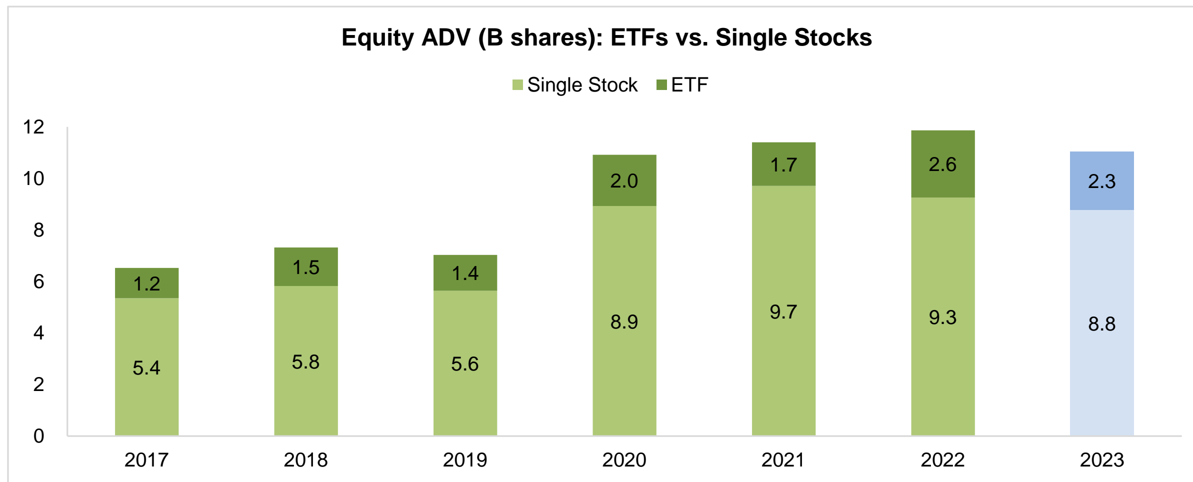

Source: Cboe Global Markets, SIFMA estimates

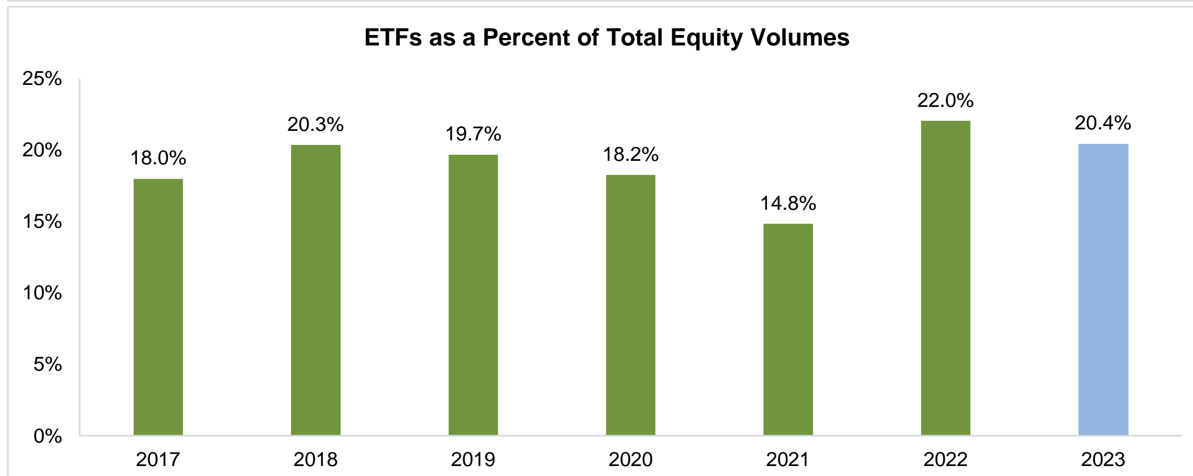
## ETFs as a Percent of Total Equities

ETF shares trade on the U.S. equity markets in the secondary market, as do the underlying stocks used to create equity ETFs. On average in 2023, ETF volume was 2.3 billion shares versus 8.8 billion shares for single stock equites.

We highlight the following ETF trends:

- ETF volumes -13.8% Y/Y, versus
    - Single stock -5.1%
    - Total equities -7.1%
- ETFs represented 20.4% of total equities volume in 2023, -1.6 pps Y/Y




Source: Cboe Global Markets, SIFMA estimates

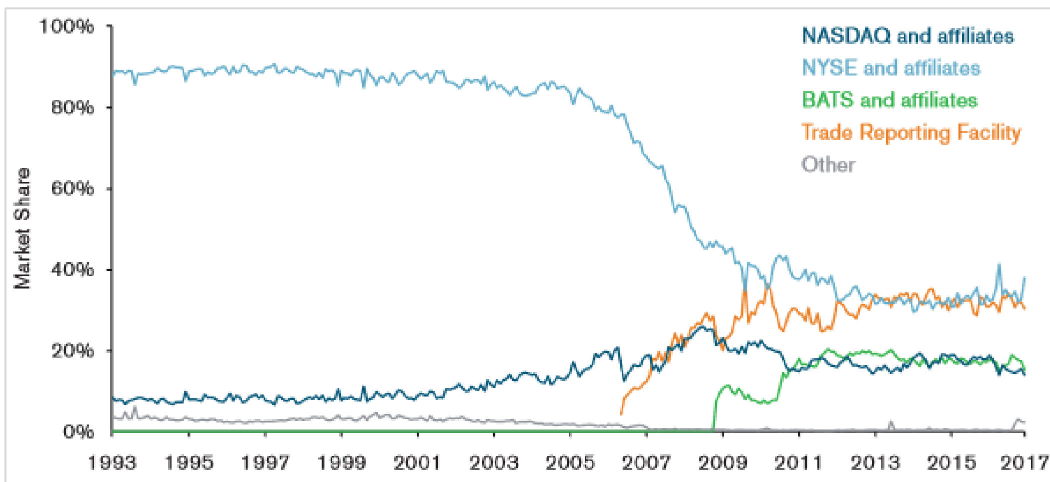
# Evolution of the Market Landscape

This section assesses the evolution of the market landscape and the current structure of the markets.

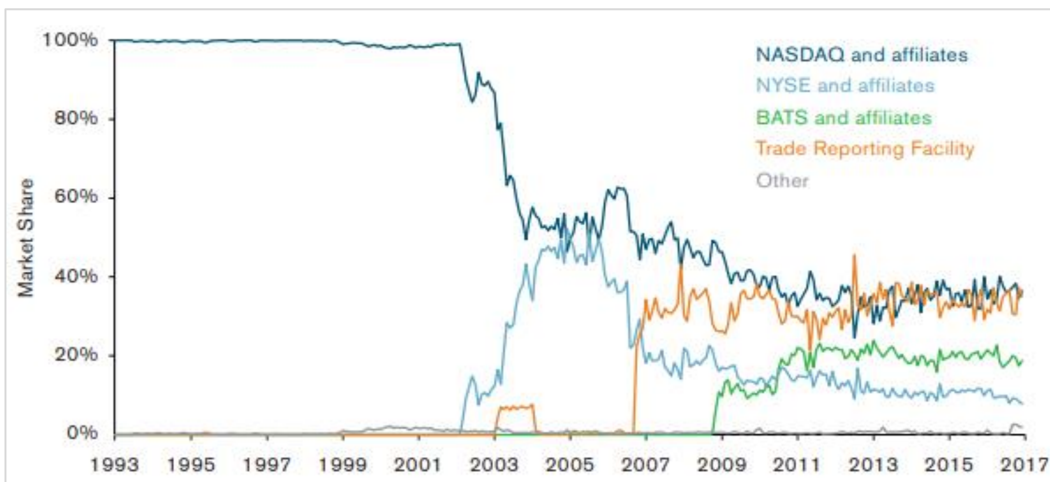
## Previously Dominated by a Few…

Decades ago, U.S. equities markets were dominated by NYSE and Nasdaq, particularly in trading of their own listed stocks. In the early 1990s, trading market shares in an exchange's own listed stocks were estimated at around: 90% for NYSE and 100% for Nasdaq. This is no longer the case, given an increase in the number of trading venues, electronification of markets, and regulation National Market System (NMS), among other factors.

### NYSE-Listed Stocks




### Nasdaq-Listed Stocks



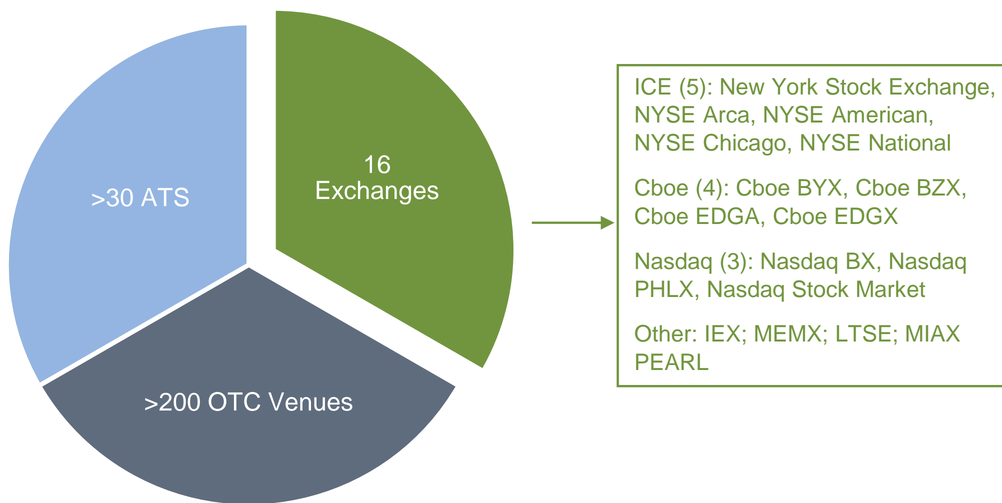

Source: As shown in the U.S. Treasury report, "A Financial System That Creates Economic Opportunities – Capital Markets". This report sources: Office of Financial Research analysis, U.S. Equities Trade and Quote (TAQ), calculated (or derived) based on data from Daily Stock File 2017 Center for Research in Security Prices (CRSP), the University of Chicago Booth School of Business.

## …Now Multiple Trading Venues

Today, we have 16 exchanges – predominantly under three main parent groups – over 30 alternative trading systems (ATS), and over 200 over-the-counter (OTC) venues. One may ask why a parent group needs to hold multiple exchange licenses, as each individual exchange must be approved by and registered with the SEC. Parent groups set up different exchanges to serve the various needs of end users, mainly based on pricing models.

This structure enabled the fragmentation of the markets, brought on over the decades by regulations and electronification of markets. Brokers, on behalf of investors, now send orders to multiple trading venues, which then compete with each other for that order flow. There is a balance between concentrated and fragmented markets. Concentrated markets can provide greater depth of book and higher probability of order execution at the terms stated by the client. Yet, concentration can lead to monopolistic behavior in terms of pricing and limit innovation. On the other side, fragmented markets can be more competitive and geared toward innovation to win business. However, this can lead to lower probability of order execution and increased total trade costs, as brokers search multiple trading venues to find the best price, as per best execution requirements.

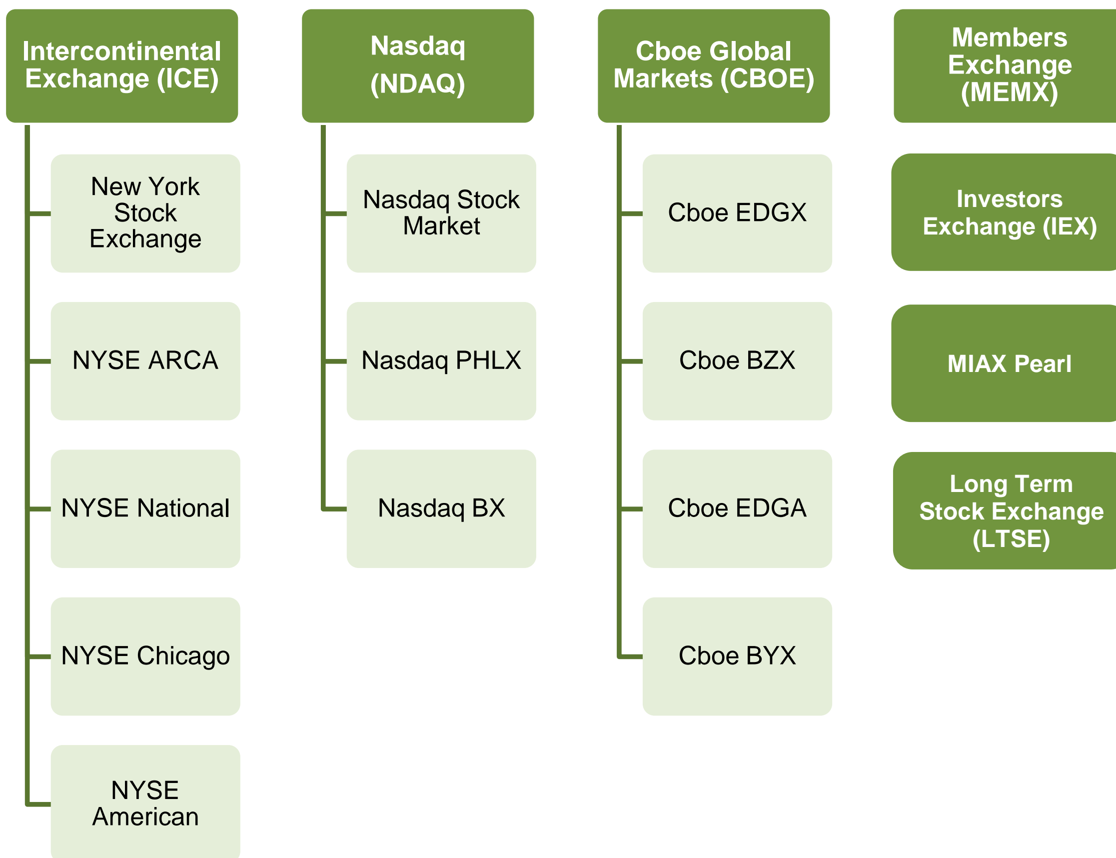
### Trading Venue Landscape




Source: Cboe Global Markets, FINRA, SIFMA estimates
Note: ICE = Intercontinental Exchange, owner of the NYSE and other exchanges and clearing houses. Cboe = Cboe Global Markets; IEX = Investors Exchange; MEMX = Members Exchange; MIAX = Miami International Securities Exchange; LTSE = Long Term Stock Exchange.

## Exchange Landscape

By law, national stock exchanges also serve as Self-Regulatory Organizations (SROs). As such, they are responsible for regulating their member firms under their own rules and federal securities laws. In the SRO role, the exchanges and Financial Industry Regulatory Authority (FINRA) enforce industry standards and requirements related to securities trading. These standards, among others, include: advance just and equitable principles of trade for the protection of investors; adopt and enforce rules of fair practice; and foster observance by its members of federal securities laws.

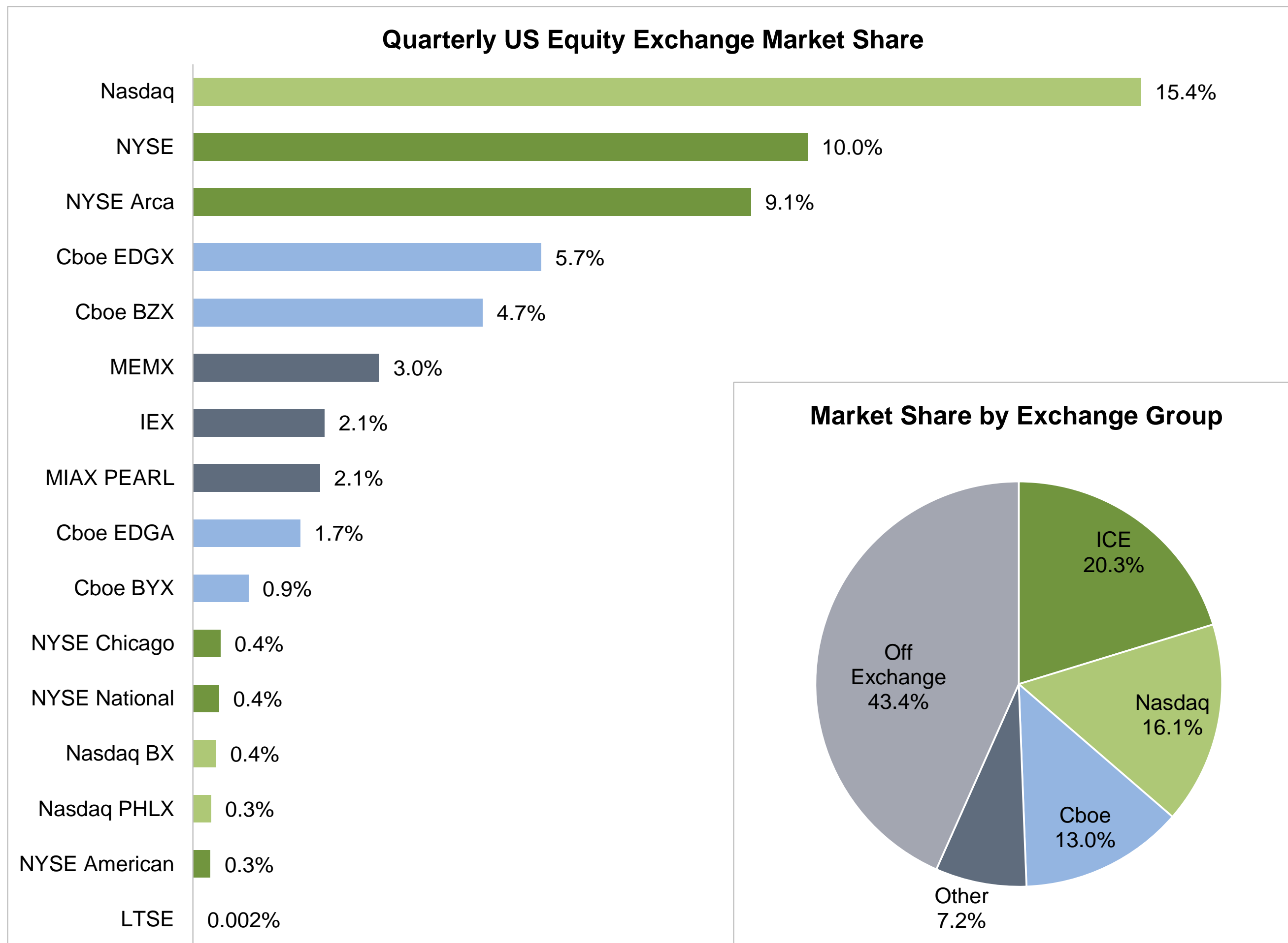



Source: Cboe Global Markets, SIFMA estimates
Note: Volumes also trade off exchange

## Exchange Market Shares

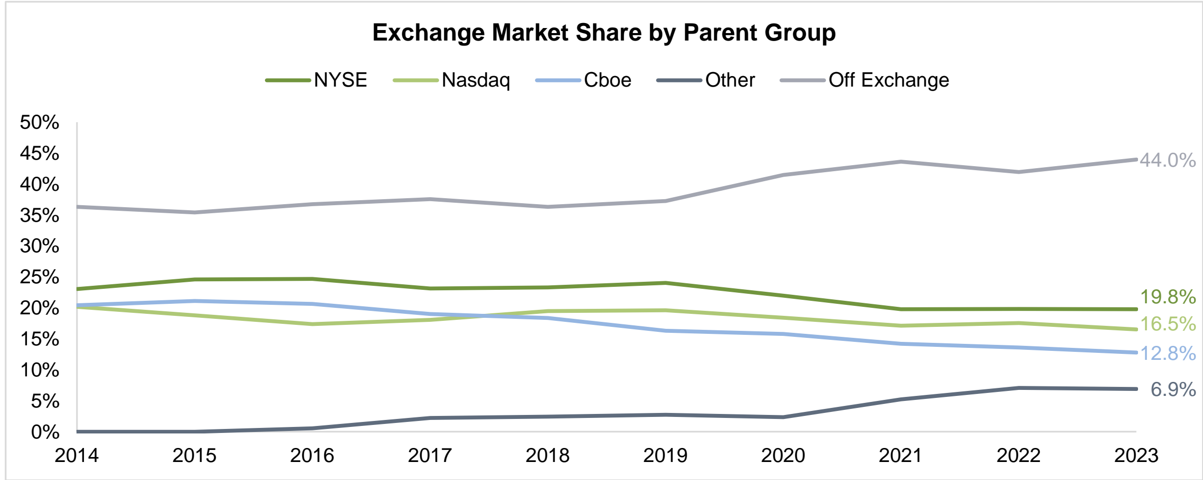
As of 2023, the Nasdaq stock exchange holds the top spot among individual exchanges, with a 15.4% market share. However, NYSE holds the top spot on aggregate, i.e. by total exchange group, with a cumulative 20.3% share across its five exchanges.

### 2023 Market Share




Source: Cboe Global Markets, SIFMA estimates
Note: As of 4Q23. Other = MEMX, IEX, MIAX Pearl, and LTSE.

## Historical Market Share

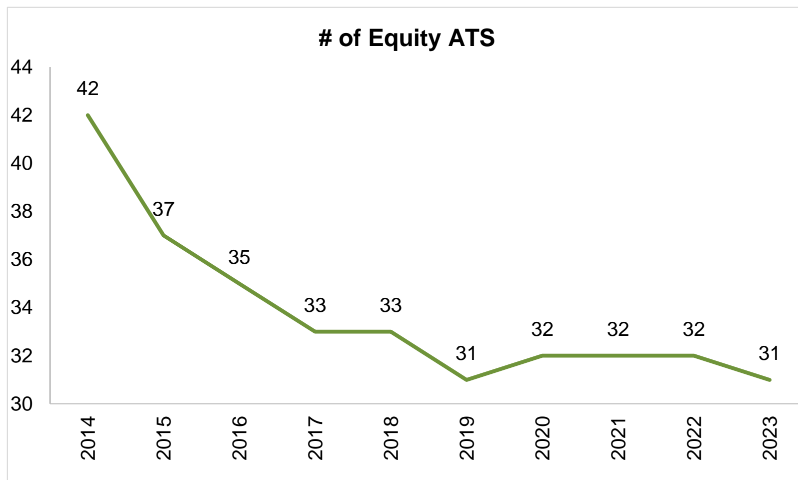



Source: Cboe Global Markets, SIFMA estimates

## Alternative Trading Systems (ATS)

Within off-exchange trading, the number of equity ATS dropped to 31 in 2023 from 42 in 2014 (-26.2%). ATS continue to provide important functionality for the markets, particularly for block trades. Block trades are considered trades containing 10,000 or greater shares.[5] Execution of these trades can be complicated. With trades of this size, the client needs its position to remain anonymous to prevent other market participants from attempting to replicate its trading strategy and thereby move the market price of the stock. Trades of this size can significantly move market prices – often changing the economics of the trade – if not executed properly.

Interestingly, when analyzing equity ATS, it is not a one-size-fits-all approach. Some ATS focus on executing large trades. As such, the average trade size for all equity ATS was around 100 in 2023 – essentially in line with that of exchanges – versus an average trade size for blocks of 17,333.



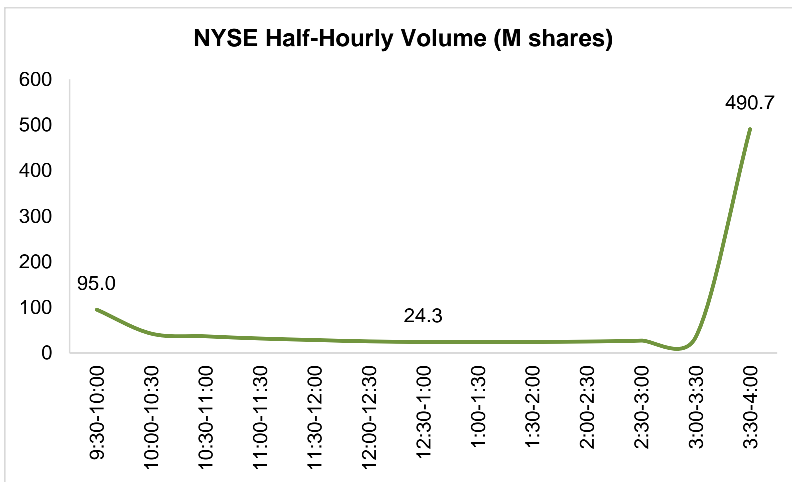

Source: FINRA, SIFMA estimates

[5] FINRA uses a less narrow definition for block trades than the market, with share-based and dollar-based thresholds.

## Volume Concentration

With intraday competition amongst market centers, volumes continue to be concentrated around the closing auctions at NYSE and Nasdaq, the two main single stock listing exchanges (for operating companies) in the U.S.[6] According to NYSE, its closing auction represents around 7% of total NYSE-listed volume – growing to over 20% on major trading days – as market participants choose to participate at the time when the maximum number of buyers and sellers come together.

Traders describe the congregation of volumes at the close – and the open, to a lesser extent – as the smile curve (albeit a lopsided smile). During the 9:30 AM to 4:00 PM trading day, there is typically higher volumes at the open and particularly at the close, with lower volumes during the middle of the day.




Source: Wall Street Journal, SIFMA estimates
Note: Averages of the daily volumes for the week of May 14, 2024

We note that over time, some liquidity has dispersed into alternative closing mechanisms. Broker-dealers and CBOE Global Markets now offer alternatives for both NYSE-listed and Nasdaq-listed stocks.

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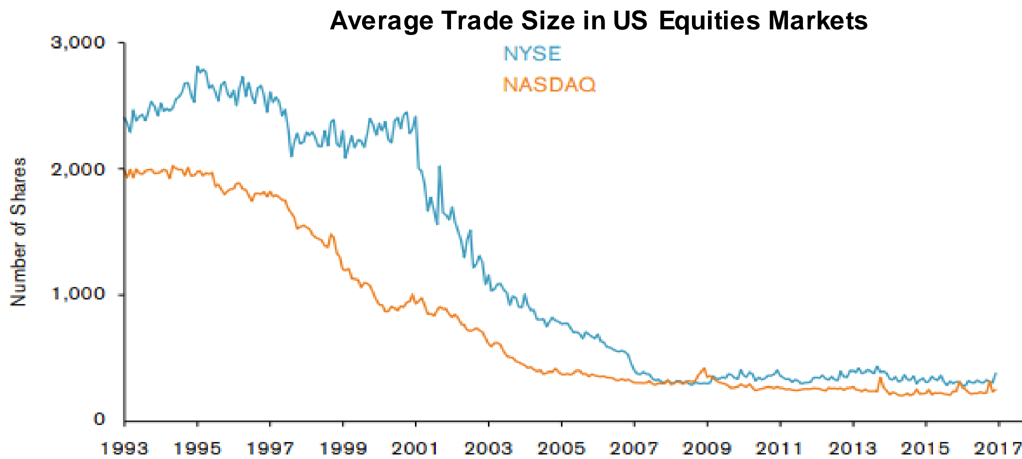
[6] Cboe Global Markets listed its own stock when it IPOd in 2016, but its strategic focus is listing ETPs rather than single stocks. IEX received listing approval but chose to exit the corporate listings business. LTSE lists a few companies.

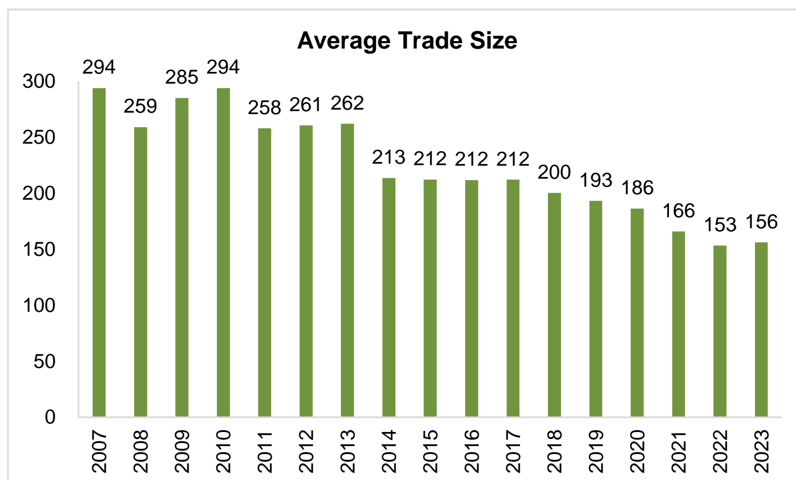
## Decreased Trade Size

It has been estimated that in the early 1990s, the average trade size was in the thousands. This level fell but remained high into the early 2000s. Trade size settled into the low hundreds after that. This was attributed to increased competition among trading venues, electronification, and Regulation National Market System (NMS), among other factors.




Source: As shown in the U.S. Treasury report, "A Financial System That Creates Economic Opportunities – Capital Markets". This report sources: Office of Financial Research analysis, Muzan Trade and Quote Data

Looking more closely at modern day trade sizes, the average trade size was 225 from 2007 to 2023. This fell to 156 in 2023, averaging 158 over the last three years.




Source: Cboe Global Markets

# Order Routing

## From Investor to Execution

Order routing is the process by which an order goes from the investor to execution. We note that the order routing process differs for institutional versus retail investors and for held versus not-held orders[7]. Once an investor places a trade, the order is routed to a broker-dealer or exchange. If the order is marketable, it is eligible for immediate execution based on current market conditions. Non-marketable orders are not immediately executable for various reasons, for example: the limit price is outside the current market; or, for institutional orders, it was an all or none trade and the quantity is not available in the market.[8] Given the growth in exchange and off-exchange trading venues, firms have built technologies to seek hidden liquidity, as market participants search for smart order routing paths to achieve best execution (best ex) of trades while minimizing market impact.

Once marketable, the broker will look at the size of the order and determine the path that will achieve best ex, taking into account order size, market price, order type, etc. Of note, a client can direct the path the broker must follow to execute his trade or else the broker can choose the path itself. The path the broker can take varies. Regulations require brokers to provide best ex for their clients[9]. However, FINRA does not specifically define what constitutes best ex, and market participants do not follow a uniform methodology themselves.

For example, a focus just on stock price as measure of best ex does not tell the whole story. During the time lapsed when searching for the price at the national best bid offer (NBBO) across all trading venues, the market could have moved, and the broker is forced to execute at a less profitable price (we note that broker dealers use algorithms to try to avoid this price slippage). Or a client may not get their entire order executed. These are all costs to trading, which can add up as brokers search across multiple trading venues.

[7] A held order is a market order that requires prompt execution for an immediate fill. With not-held orders, brokers have both time and price discretion to attempt to get a better fill for a customer.

[8] In accordance with order handling rules, limit orders are displayed on exchange.

[9]Brokers are legally required to seek the best execution reasonably available for their customers' orders. To comply with this requirement, brokers evaluate the orders they receive from all customers in the aggregate and periodically assess which competing markets or market makers offer the most favorable terms of execution. Some of the factors a broker must consider when seeking best execution of customers' orders include: the opportunity to get a better price than what is currently quoted, the speed of execution, and the likelihood that the trade will be executed.

The total cost of a trade can be split into explicit and implicit costs:

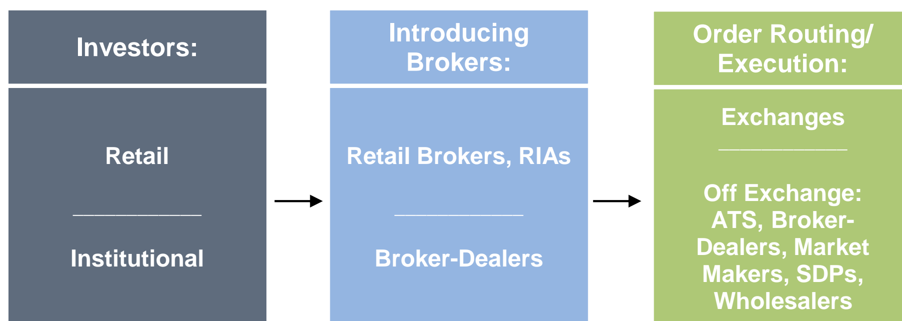
**Trade Cost = $f$ (explicit costs + implicit costs)**

Explicit and implicit costs may include:

| Type | Description |
|---|---|
| **Explicit** | Broker or dealer commissions: Fees to cover trade execution expenses; may provide a reasonable profit for executing the trade; may add a premium for the risk that the dealer may lose money executing the transaction (only if acting as a principal); covers the costs to hold the inventory of securities to make markets (supply of securities and capital required to be held against these securities); cover costs of staff and technology; etc. |
| | Transaction costs/market access fees: Fees paid for accessing liquidity are added to trade costs; rebates received for adding liquidity are subtracted from trade costs |
| | Clearing and settlement costs |
| | Regulatory fees (SEC Section 31 fees, FINRA trading activity fee, etc.) |
| | |
| **Implicit** | Bid-ask spreads |
| | Opportunity cost: The loss of potential gain for investors on other alternatives when one alternative is chosen; for example, the time it takes to fill an order, the percent of an order filled, etc. |
| | Price impact of a trade: Trade price deviates from current market price as a result of the trade, for example: |
| | -- Losses can occur from market prices moving when executing large volumes; block trades are often performed off exchange to lessen this price impact |
| | -- In some markets, including in the U.S., brokers are required to seek best execution for clients (best ex includes an assessment of an opportunity to get a better price than what is currently quoted, the speed of execution, the likelihood that the trade will be executed, percent of fulfillment at current prices, etc.). In the time it can take to meet this requirement, markets may move, and the broker must then execute at a less profitable price or not execute the clients' order. |
| | Information leakage: Occurs when other market participants learn a market participant plans to execute a large block; they get ahead of that trade and move prices. Blocks are typically split in smaller amounts and electronically executed (depending upon market) over time to avoid a significant price impact; however, this makes the trade vulnerable to others anticipating its occurrence and trading ahead of it. Anonymity is key. |

The equity order routing process is complex, and labeling firms can be just as complicated. An individual firm may not be monolithic, as it can have multiple businesses. For example, a global investment bank could have a business unit registered as a broker-dealer, a retail broker, a wholesaler, an ATS, an asset manager, and a market maker. That said, below we define firm types and provide lists on many of the players in the equity trading ecosystem.

**Order Routing**




Note: ATS= alternative trading system; SDP = single-dealer platform. RIA = registered investment advisor. RIAs have the option to route through their clearing firm or manage their own connections and routing. Most prefer the former given cost constraints and the added regulatory and compliance burdens. That said, they are still responsible for best ex and any regulatory reporting/disclosures (ex: Rule 605).

**Introducing Brokers**

- Registered Investment Advisors (RIA) – Engage in the business of providing investment advice to others about the value of investing in securities and/or in issuing reports or analyses regarding securities. Manage the assets of individual and institutional investors.

- Retail Brokers – Facilitate equity trades for their clients, as well as potentially selling additional securities and financial products such as mutual funds, limited partnerships, fixed income, options, and real estate investment trusts. They might advise clients on individual retirement accounts, manage their assets, etc.

**Order Routing/Execution**

- Exchanges – Exchanges are marketplaces where securities are traded, with the main role of ensuring fair and orderly trading and the efficient dissemination of price information for any securities trading on that exchange. The SEC regulates these venues as national securities exchanges, and exchanges also have status as self-regulatory organizations (SRO), enabling them to set standards and enforce those standards on their members.

- Off Exchange:
  - Trades by all off-exchange firms/venues are reported to the consolidated tape immediately and contribute to price discovery in real time.
  - Alternative Trading Systems (ATS) – SEC regulated electronic trading systems operated by broker-dealers that match orders for buyers and sellers, allowing their users to place orders without publicly displaying the size and price of their orders to other participants in the ecosystem.
  - Broker-Dealers (BD) – Buy and sell securities on behalf of its institutional clients and retail brokers to enable trading activities and the flow of securities in markets. These firms may provide investment advice, supply liquidity through market making activities, facilitate trading activities, publish investment research, raise capital for companies, and more. FINRA indicates there were 2,867 standalone and 433 dual registered (also registered as an investment advisor) broker-dealers (as of 2023), ranging from small independent firms to large global investment banks.
  - Market Makers (MM) – Provide liquidity in securities and execute trades both on and off national securities exchanges, actively quoting two-sided markets in a stock, providing bids (buys) and asks (sells). Market makers provide liquidity for all exchange listed stocks in which they make a market, committing their own capital to enable transactions and maintaining an inventory of the stocks in which they make a market. Registered market makers must be broker-dealers.
  - Single-Dealer Platforms (SDP) – An electronic trading platform operated by a broker-dealer where the firm itself acts as the principal counterparty for every transaction. Unlike an ATS, where subscribers' orders to buy and sell are matched with one another by the ATS, on an SDP, the broker-dealer operating the SDP is always the counterparty to any trade that occurs on the SDP.
  - Wholesalers – For wholesalers, the trade flow is broadly retail. A wholesaler is a broker-dealer that acts as a market marker for other broker-dealers. Some broker-dealers, especially retail broker-dealers, route all or a significant portion of their orders to one or more wholesalers. A wholesaler's business is to execute those orders, which may involve executing the orders itself or further routing to other venues. Additionally, wholesalers have the ability to internalize order flow – the practice of matching orders internally on their own trading desks – enabling them to improve upon execution offered directly on exchange.

    Wholesalers provide a suite of services to their clients, particularly retail brokers. To begin with, they undertake the operational complexity of connecting to all trading venues – and provide many other services – for their clients. An important service is assuming the best execution obligation. Another important function of wholesalers is that they guarantee execution for retail trades.

    Finally, wholesalers compete with each other to execute retail broker orders and are judged on their execution quality. If one wholesaler does not provide good execution for a retail broker’s orders, it will be replaced with another wholesaler which provides better execution for that retail brokers’ orders.

We also note that when routing and executing trades, firms and venues can act either as a principal or non-principal (agent) participant:

- Principal – provide liquidity on and off exchange (broker-dealers, market makers, single-dealer platforms, and wholesalers).
- Non Principal –
    - Match buy and sell orders (alternative trading systems, exchanges).
    - Offer algorithms and routers to handle and fill clients' orders (agent broker-dealers).

### Retail Brokers

- Ally Invest
- Apex
- Charles Schwab
- Fidelity Brokerage
- Interactive Brokers
- Morgan Stanley (includes the E*TRADE business)
- Robinhood
- Tastyworks
- TD Ameritrade and TD Ameritrade Clearing (now fully integrated into Charles Schwab)
- TradeStation (a subsidiary of the Monex Group)
- WeBull

Source: SEC Rule 606 filings, as compiled by Bloomberg Intelligence (as of December 2023).
Note: Not an all-inclusive list. These firms are also registered broker-dealers.

### Broker-Dealers

- Bank of America
- Barclays
- BNP Paribas
- Citadel Securities
- Citigroup
- Credit Suisse
- Deutsche Bank
- Goldman Sachs
- HSBC
- JP Morgan
- Morgan Stanley
- Société Générale
- Susquehanna
- UBS
- Wells Fargo
- Virtu Financial

Note: Not an all-inclusive list.

### Market Makers

- Bank of America
- Citadel Securities
- G1 Execution Services/Susquehanna
- Jane Street
- JP Morgan
- Hudson River Trading
- Morgan Stanley
- Two Sigma Securities
- UBS
- Virtu Financial

Source: SEC Rule 605 filings, as compiled by Bloomberg Intelligence (as of December 2023).
Note: Not an all-inclusive list. These firms are also registered broker-dealers.

### Wholesalers

- Citadel Securities
- Coda Markets
- G1 Execution Services/Susquehanna
- Jane Street
- Hudson River Trading
- Morgan Stanley
- StoneX
- Two Sigma Securities
- UBS
- Virtu Financial

Source: SEC Rule 606 filings, as compiled by Bloomberg Intelligence (as of December 2023)
Note: These firms are also registered broker-dealers. Includes currently active firms, i.e. firms with dollar amounts reported in 2023. Prior firms include (exited the business, etc.): Instinet/BlockCross, Interactive Brokers, National Financial, Apex Clearing, Canaccord Capital, GTS Securities, Goldman Sachs, Wolverine, XTX Markets

### Equity Alternative Trading Systems (ATS)

- BIDS ATS
- BNPP CORTEX ATS
- BOATS
- CBX
- CITI-ONE ATS
- CODA
- CROSSSTREAM
- DEALERWEB
- IBKR ATS
- IBKR EOS ATS
- INSTINCT X
- INSTINET BLOCKCROSS
- INTELLIGENT CROSS LLC
- JPB-X
- JPM-X
- LEVEL ATS
- LIQUIDNET H2O ATS
- LIQUIDNET NEGOTIATION ATS
- LUMINEX ATS
- MS POOL (ATS-4)
- MS RPOOL (ATS-6)
- MS TRAJECTORY CROSS (ATS-1)
- ONECHRONOS
- POSIT
- PURESTREAM
- SIGMA X2
- STIFEL X
- THE BARCLAYS ATS
- UBS ATS
- VIRTU MATCHIT ATS
- XE

Source: FINRA (as of 4Q23)
Note: Not an all-inclusive list

# Equity Market Regulations[10]

## Securities Act of 1933

https://www.govinfo.gov/content/pkg/COMPS-1884/pdf/COMPS-1884.pdf

**Catalyst:** The stock market crash of 1929

**Objective:** (1) Ensure transparency in financial statements to assist investors in making informed decisions; (2) prohibit deceit, misrepresentation and other fraud in the sale of securities.

**Details:**

Also known as the Securities Act or Truth in Securities Act, this was the first federal law used to regulate the stock market and the first major law on the sale of securities, which had historically been governed by state laws. Importantly, the act created a uniform set of rules to protect investors against fraud.

The Securities Act required companies to register with the SEC prior to going public, providing relevant financial and other information in a prospectus and registration statement. Information required included: corporate description of properties and businesses; management information; financial statements certified by an independent account; and a description of the security being offered. Some exemptions from the registration requirement existed (private offerings to a limited number of persons or institutions; offerings of limited size; intrastate offerings; and securities of municipal, state and federal governments).

## Securities Exchange Act of 1934

https://www.govinfo.gov/content/pkg/COMPS-1885/pdf/COMPS-1885.pdf

**Catalyst:** The stock market crash of 1929

**Objective:** (1) Create the SEC to regulate the securities industry; (2) establish self regulation; (3) regulate trading of securities.

**Details:**

Also known as the Exchange Act, this law empowered the SEC with broad authority over all aspects of the securities industry. It tasked the agency to register, regulate and oversee brokerage firms, transfer agents, and clearing agencies as well as the nation's securities self-regulatory organizations (SROs). This act identified and prohibited certain types of conduct and provided the SEC with disciplinary powers over regulated entities and persons associated with them. The Exchange Act also enabled the SEC to require periodic reporting of information by publicly traded companies. Further, the act established supervised exchange self regulation[11], with direct and flexible requirements for exchanges. On the direct side, exchanges must: register with the SEC; restrict broker-dealer borrowing; and prohibit manipulative practices. Additionally, exchanges have discretion in monitoring their markets, relying on self-regulation (the flexible aspect).

[10] Additional NMS Plan descriptions can be viewed on the SEC's website here: https://www.sec.gov/rules/sro/nms.htm

[11] While self-regulation dates back to the Buttonwoods Agreement, and early stock exchanges formed constitutions and by laws on their own, this was the first version of supervised self-regulation.

## Maloney Act Amendments of 1938

https://www.sechistorical.org/collection/papers/1930/1938_0617_MemoMaloney.pdf

**Catalyst:** General update to regulations as the trading landscape evolves, i.e. off-exchange trading

**Objective:** Establish the NASD to regulate OTC markets.

**Details:**

This act authorized the SEC to register national associations of broker-dealers for the purpose of regulating themselves under SEC oversight. The Maloney Act established the National Association of Securities Dealers (NASD), with a mandate to: standardize the securities industry's principles and practices; promote high standards of commercial honor; advance just and equitable principles of trade for the protection of investors; adopt and enforce rules of fair practice; and foster observance by its members of federal and state securities laws (the promotion of capital formation was added in 1963).

## Securities Act Amendments of 1975

https://www.congress.gov/bill/94th-congress/senate-bill/249/text

**Catalyst:** Lack of market efficiency and the Paper Crisis

**Objective:** Integrate markets and promote competition by establishing a national market system.

**Details:**

In the 1960s/1970s, Congress and the SEC were concerned about inefficiencies and lack of competition in markets, wondering whether investors were getting the best price to transact. They were concerned that the same stock sometimes traded at different prices across various trading venues. For example, the NYSE ticker tape did not report transactions of NYSE-listed stocks that took place on regional exchanges or OTC markets. This made it difficult for traders to assess the whole market and determine the best price. The chaos from the paper crisis furthered the case for a central system. This act – while also imposing an obligation on the SEC to consider the impacts of new regulation on competition – empowered the SEC to establish a national market system and a system for nationwide clearing and settlement of securities transactions. This act enabled the Securities Industry Processors (SIPs), a structured method of transmitting securities transactions in real-time and showing the price and volume data for the transactions. This was a further shift from industry driven rules to regulatory mandates prescribing rules for all equity transactions.

Interestingly, Congress noted competitive forces were to drive market development. The goal was to link trading venues across the country – there were still many regional exchanges at this time – to promote competition and allow orders to be executed at the best price. Congress provided the SEC with five factors to establish a functioning national market system: (1) efficiency; (2) competition; (3) price transparency; (4) best execution; and (5) order interaction. Additionally, they indicated new technologies would increase efficiency, with improved communications and data processing tools linking markets. The objective was to increase information flow and enable the ability to offset orders, all contributing to best execution.

## Order Handling Rules (1997)

https://www.sec.gov/files/rules/other/34-38156.txt

**Catalyst:** General update to regulations as the trading landscape evolves, i.e. technological advances

**Objective:** Enhance the quality of published quotations for securities and promote competition and pricing efficiency.

**Details:**

The SEC requires a market maker to display customer limit orders that (1) are priced better than a market maker's quote or (2) add to the size associated with a market maker's quote when the market maker is at the best price in the market. This gives investors the ability to directly advertise their trading interest to the marketplace, enabling them to trade inside the current bid-ask spread and thereby compete with market maker quotations and narrow the size of the bid-ask spread. This rule amended prior regulations to require a market maker to display in its quote any better priced orders that it places into an electronic communication network (ECN)[12]. Alternatively, it may comply with the display requirements through the ECN itself, provided the ECN (1) ensures that the best priced orders entered by market makers into the ECN are included in the public quotation, and (2) provides equivalent access to the ECN for brokers that do not subscribe to the ECN.

## Regulation Alternative Trading Systems (Reg ATS, 1998)

https://www.sec.gov/rules/final/34-40760.txt
https://www.sec.gov/divisions/marketreg/form-ats-n-filings.htm

**Catalyst:** General update to regulations as the trading landscape evolves, i.e. technological advances

**Objective:** Strengthen the securities markets, while encouraging innovative new markets.

**Details:**

At the time there was a growing acceptance of technology to provide investors with an increasing array of services, often more efficiently and at a lower cost. However, the regulatory environment at the time was not designed to incorporate these types of systems, despite the fact ATS were already handling around 20% of the orders in securities listed on Nasdaq and almost 4% of other exchange listed securities. Yet, ATS were private, available only to chosen subscribers and regulated as broker-dealers, not like registered exchanges.

The SEC was concerned this could affect investor protections and the operation of the markets as a whole, as ATS remained outside the national market system. For example, market makers could quote prices better than those made available to public investors, since they were not fully disclosed. Reg ATS allowed ATS to choose to register as national securities exchanges or as broker-dealers, then comply with additional requirements depending on their activities and trading volume. In 2015, the SEC proposed rules to enhance transparency and oversight of ATS, including: providing information about and activities of the broker-dealer operating the NMS Stock ATS and detailing how the ATS is operated; making these details public; establishing a process for the SEC

[12] We note that ECNs are no longer part of equity market structure.

to review material changes to the operation of an ATS; and requiring ATS to protect subscribers' confidential trading information.

Additionally, the SEC established Rule 304 of Reg ATS, requiring ATS that trade NMS stocks to publicly file Form ATS-N (plus amendments to the initial form and notices of cessations of operations). This form requires disclosures about the manner of operations of the NMS Stock ATS and the ATS-related activities of the broker-dealer operator and its affiliates, among other things.

## Decimalization (2000)

https://www.sec.gov/rules/other/34-42360.htm

**Catalyst:** General update to regulations as the trading landscape evolves

**Objective:** Match the rest of the world already using decimalization.

**Details:**

The original convention of quoting stock prices in fractions dated back over two hundred years, leaving the U.S. the only major market at the time not to price securities in decimals. The SEC, after discussions with market participants, recognized the potential benefits of decimal pricing over the fraction-based pricing scheme. Decimalization moved the smallest price improvement from 1/16th (or $0.0625) to $0.01.

The primary case for decimalization was it would result in: tighter spreads; increased competition among market makers; and make quotes easier to understand. These factors would all benefit investors and the markets themselves.

## Regulation National Market System (Reg NMS, 2005)

https://www.sec.gov/rules/final/34-51808.pdf

**Catalyst:** A need to modernize regulations to match changes in the markets

**Objective:** (1) Consolidate the rules promoting the national market system; and (2) modernize and strengthen the NMS system.

**Details:**

In the 1970s, the equities markets consisted of mutualized exchanges and human interaction to execute orders. By 2005, computers dominated execution, and exchanges had begun to demutualize and became global for-profit publicly traded entities in many cases. Speed became king, with trades executing in fractions of a second and algorithms executing trading strategies.

Reg NMS is responsible for the current equity market structure. This rule was intended to assure investors receive the best prices for order execution by encouraging competition in the marketplace, fostering competition among individual markets and orders to promote efficient and fair price formation across securities markets.

Key rules included:

- **Market Data Rules** (Rules 601 and 603) – These rules amended existing SEC rules and NMS plans governing the revenue allocation, plan governance, and distribution and display of market data.
    - Revenue Allocation Formula – This section instituted a new market data revenue allocation formula, splitting the revenue generated by charging for SIP market data across trading centers. Originally, the formula was based solely on the trading activity of an SRO. The new formula included a number of elements, such as: quoting share (dollar size and length of time equal to the price of the NBBO); NBBO improvement share (displayed quotations improve the price of the NBBO); trading share (average of the percentage of total dollar volume and percentage of qualified trades, i.e. dollar volume $5,000+); and security income allocation (square root of dollar volume; adjusts for the disproportionate level of trading in the top tier of stocks).
    - Plan Governance – This section created non-voting advisory committees for the NMS Plans governing the SIPs, inclusive of non-SRO members, who would have the right to submit their views to the NMS Plan operating committees on matters, including any new or modified product, fee, contract or pilot program.
    - Amendments to Rules 11Aa3-1 and 11Ac1-2 (redesignated as Rules 601 and 603)
        - Independent Distribution of Information – This section rescinded the prohibition on SROs and their members from disseminating their trade reports independently, with or without fees. The Sec believed this would be beneficial to investors and other information users because depth of book quotations had become increasingly important.
        - Consolidation of Information – This section clarified that all SROs – whether existing or new – would be required to participate jointly in one or more Plans to disseminate consolidated information in NMS stocks.
        - Display of Consolidated Information – This section revised the consolidated display requirement by limiting its scope and incorporating a new definition of consolidated display limited to the prices, sizes, and market center identifications of the NBBO and the consolidated last sale information. Beyond disclosure of this basic information, market forces, rather than regulatory requirements, would be allowed to determine what, if any, additional data from other market centers is displayed.

- **Access Rule** (Rule 610) – This established a uniform standard to ensure fair and non-discriminatory access to quotes by all trading centers.[13] It also imposed a limit on what trading centers could charge to access protected quotations, as well as mandating SROs to enforce rules to prohibit members from interfering with protected quotes of other trading centers or creating locked or crossed markets.

[13]Trading centers: exchanges, associations operating a trading facility, ATS, market makers, and broker-dealers executing orders internally as a principal or agent.

- **Order Protection Rule** (Trade Through; Rule 611) – The objective was to mandate trades be executed at the best displayed price. This rule required trading centers to establish, maintain and enforce policies and procedures to prevent trade executions at prices inferior to other trading centers. A trading center cannot "trade through" (essentially ignore) a better displayed quote, rather it must route the trade to the venue displaying the better quote or execute the trade at the better price or improve it. Reserve or hidden orders can be ignored – as can manual quotes, those not published on the Securities Information Processor (SIP, the consolidated tape), even if at a better price – and are not protected. This rule put price and speed ahead of all other best execution factors (fill rates, etc.), which can actually increase total trading costs.
- **Sub-Penny Rule** (Rule 612) – This established minimum pricing increments, preventing market participants from displaying quotes in increments less than a penny (for all NMS securities except those priced at less than $1.00). The objective is to prevent traders from outbidding customers' orders by a fraction of a penny, preventing customers' orders from getting executed.

## Rule 613: Consolidated Audit Trail (CAT, 2012)

https://www.sec.gov/divisions/marketreg/rule613-info.htm

**Catalyst:** May 2010 Flash Crash

**Objective:** Provide FINRA, the SEC, and the exchanges data to enable a view of the whole market, including granularity at the customer account level.

**Details:**

The SEC adopted Rule 613 to create a comprehensive consolidated audit trail that would allow regulators to efficiently and accurately track all market activity. The rule required SROs to jointly submit a plan to create, implement and maintain a consolidated audit trail (CAT), and mandates include:

- Provide certain detailed information (origination, modification, cancellation, routing, and execution) to the CAT for each quote and order, and each reportable event with respect to each quote and order, in an NMS security.
- Require all reportable events to be reported to the CAT so it can link them to an order through its entire life cycle from generation through routing, modification, cancellation, or execution.
- Establish unique and consistent identifiers for each broker-dealer and national securities exchange.
- Establish unique and consistent identifiers for each account holder, as well as any person who has trading discretion over an account.
- Require synchronization of business clocks used to record date and time of any reportable event and require timestamps for each reportable event to the CAT to be in millisecond or finer increments.

**Industry Data Concerns**

The industry has long expressed both (1) security and (2) cost concerns around the amount and protection of data collected by the CAT. FINRA shares industry concerns around the need for and security of the personal information collected in the customer database, while finding value from the transaction data for regulatory purposes. FINRA

has noted that they are not in favor of the model approved by the SEC and wrote comment letters expressing their disappointment. The funding model is now being litigated.

There are two parts to the CAT:

- Transaction database – This is an audit trail on orders and transactions in securities and options which regulators need to surveil the over $600 billion traded each day in markets. FINRA is in favor of this database.
- Customer database – This holds data on everyone who has a securities account. The idea behind it was that when regulators see something in the transaction database, they can use the customer database to quickly identify the person behind the problematic trading (insider trading, market manipulation, etc.). The model was to pull all the customer data in upfront so that it is immediately accessible if it was needed later. This was completed in June 2024, yet significant concerns remain over the inclusion and use of personally identifiable information (PII) in the CAT, especially since the SEC has not yet approved the CAT data security amendment (proposed in 2020). FINRA shares concerns about privacy and security and the overall need for this approach.

While the SEC removed social security numbers, the customer database still contains names, years of birth, and zip codes. FINRA believes – as does the industry – that this information should be removed. Information on every person trading – including retail investors trading small numbers of shares – does not need to be captured and maintained for the CAT system to work. One suggestion from FINRA was to use the large trader IDs instead. These are people who can move markets, and they are required to be identified under SEC rules. Their information could be retained, with the other data removed. Another idea FINRA suggested was to have a system where if a regulator saw something in the transaction database, they can make a request for more information on the parties involved from the firms through which they traded. This "request response system" is modeled off a design SIFMA created and suggested back in 2018.

While it would be easier for an investigator to have everything and anything upfront, FINRA has stated that you cannot base policy decisions on whether a choice makes regulatory oversight easy. Removing this PII would alleviate data privacy concerns, as well as reduce costs – smaller data footprint, less fees assessed.

## Measures to Adress Market Volatility (2012)

https://www.sec.gov/oiea/investor-alerts-bulletins/investor-alerts-circuitbreakersbulletinhtm.html

**Catalyst:** May 2010 Flash Crash

**Objective:** To address extraordinary market volatility in NMS Stocks.

**Details:**

The NMS Plan to Address Extraordinary Market Volatility was designed to address the type of sudden price movements the market experienced during the Flash Crash. This includes:

- **Limit Up-Limit Down Mechanism (LULD)** – This addresses market volatility by preventing trades in listed equity securities when triggered by large, sudden price moves in an individual

stock, i.e. preventing trades from occurring outside of a specified price band. This price band is set at a percentage level above and below the average price of the stock over the immediately preceding five-minute trading period, including: 5%, 10%, 20%, or the lesser of $0.15 or 75%, depending on the price of the stock (the price bands double during the opening and closing periods of the trading day). If the stock price does not naturally move back within the price bands within 15 seconds, there will be a five-minute trading pause.

- **Revised Market-Wide Circuit Breakers** – First introduced after the 1987 market crash, market-wide circuit breakers provide for cross-market trading halts during a severe market decline as measured by a single-day decrease in the S&P 500 Index, at these thresholds: 7% (Level 1), 13% (Level 2), and 20% (Level 3). These triggers are set by the markets at point levels that are calculated daily based on the prior day's closing price of the S&P 500 Index. A market decline that triggers a Level 1 or Level 2 circuit breaker before 3:25 p.m. will halt market-wide trading for 15 minutes, while a similar market decline at or after 3:25 p.m. will not halt market-wide trading. A market decline that triggers a Level 3 circuit breaker, at any time during the trading day, will halt market-wide trading for the remainder of the trading day.
- **Large Trader Reporting Regime** – This rule established large trader reporting requirements to identify large market participants, collect information on their trading and analyze their trading activity. The new rule required large traders to self register with the SEC, assigning each trader a unique identification number. Large traders will provide this number to broker-dealers, who will be required to maintain transaction records for each large trader and report this information to the SEC upon request.

## Regulation Systems Compliance and Integrity (Reg SCI, 2014)

https://www.sec.gov/rules/final/2014/34-73639.pdf

**Catalyst:** The evolution of new technologies, as well as external events (ex: Superstorm Sandy)

**Objective:** Ensure the resiliency of trading systems.

**Details:**

The rules were designed to: reduce the occurrence of systems issues (glitches, crashes, etc.); improve resiliency when systems problems do occur; and enhance regulatory oversight and enforcement of market technology infrastructure. The regulation applies to SROs, registered clearing agencies, ATS trading NMS and non-NMS stocks exceeding specified volume thresholds, disseminators of consolidated market data (plan processors) and certain exempt clearing agencies. The regulation required exchanges to design, develop, test, maintain and surveil systems for key securities market functions: trading, clearance and settlement, order routing, market data, market regulation and market surveillance. Reg SCI did not necessarily introduce new procedures to the exchanges – systems resiliency is important to combat reputational risk and their entire business model and exchanges continuously invest in systems and technology – but rather put formal rules down on paper.

## Pilots to Assess Potential Changes

Historically, the SEC utilized pilot programs to test changes to market structure, noting pilots come with real costs to market participants and therefore need a solid structure, a clearly defined program, a set end date, and an assessment system to measure success. The SEC uses these pilots to collect high-quality data to determine if a proposed change helps markets or if it could lead to a suboptimal solution.

### Tick Size Pilot (2016)

The two-year tick size pilot was designed by the SEC to assess the impact of wider minimum quoting and trading increments (tick sizes) on the liquidity and trading of small cap stocks. Beginning in October 2016, the pilot included stocks with a market cap less than $3 billion and share prices of at least $2.00, splitting them into one control and three test groups (around 400 stocks in each test group and the rest in the control group). The groups were broken out as follows:

- **Test Group #1** – Quoting in $0.05 per share increments but continue to trade at the current price increments, subject to limited exceptions.
- **Test Group #2** – Quoting in $0.05 per share increments but trading in $0.05 per share increments. Exceptions permit executions that are the (1) midpoint between the NBBO, (2) retail investor orders with price improvement of at least $0.005 per share, or (3) negotiated trades.
- **Test Group #3** – Quoting in $0.05 per share increments and trading in $0.05 per share. These securities are also subject to a trade-at prohibition, preventing price matching by a trading center that is not displaying the best price, subject to limited exceptions.
- **Control Group** – Continue to quote and trade at the current tick size increment of $0.01 per share.

The thought process behind the pilot was that a wider tick increment might improve liquidity for smaller cap stocks, potentially increasing the number of market makers trading the stocks, research analysts covering the stocks, and overall trading in these names. The pilot expired October 2, 2018.

The pilot was widely considered a failure by market participants. Coalition Greenwich estimated that the pilot cost investors from $350 million to $900 million, not including implementation costs to the industry which could have been in the hundreds of millions.

### Proposed Transaction Fee Pilot (2019, never enacted)

The objective of the proposed transaction fee pilot, or access fee pilot, was to assess the impact of transaction-based fees and rebates, and changes to those fees and rebates, on order routing behavior, execution quality, and general market quality. This was a two-year pilot, with a one-year automatic sunset. The pilot was to apply to all NMS stocks of any market cap, with a share price of at least $2.00 (and not closing below $1.00 per share during the proposed pilot) and to include all equities exchanges (including taker-maker exchanges).

The groups were broken out as follows:

- **Test Group #1** – $0.0015 fee cap for removing and providing displayed liquidity (no cap on rebates)
- **Test Group #2** – $0.0005 fee cap for removing and providing displayed liquidity (no cap on rebates)
- **Test Group #3** – Rebates and linked pricing prohibited for removing and providing displayed and undisplayed liquidity; Rule 610(c) cap continues to apply to fees for removing displayed liquidity (30 cents per 100 shares cap to access protected quotations)
- **Control Group** – Rule 610(c) cap continues to apply to fees for removing displayed liquidity (30 cents per 100 shares cap to access protected quotations)

While the SEC's proposal arose out of a recommendation by the Equity Market Structure Advisory Committee (EMSAC, now dissolved), the inclusion of a test group ending rebates diverged from the EMSAC. Yet, the SEC believed it would be missing an opportunity to fully evaluate exchange pricing models without this feature. At the end of the pilot, the SEC intended to also assess the appropriate role of regulators in setting market pricing – could competitive market forces cap fees without the government setting caps?

Market participants had expressed concerns about the size of the test buckets: 1,000 stocks in each of three groups, totaling over one-third of all NMS stocks. In 2019, exchanges sued the SEC to halt the pilot. In 2020, a federal appeals court agreed with the exchanges that the regulator exceeded its authority, indicating that the SEC acted outside of its authority in approving the pilot.

### Roundtables to Discuss Potential Changes

In 2018/19, the SEC also held a series of roundtables to discuss market structure issues and potential fixes with market participants. These exercises included:

- **Market structure for low volume securities** (<100,000 ADV) – 50% of NMS stocks were low volume, as were ~30% of U.S. corporate stocks. The low volume corporate stocks represented 15% of total NMS stocks at the time, but <1% of total NMS volume (low volume ETPs equal 18% and <0.5% respectively). While low volume stocks may be illiquid for many reasons, the SEC indicated it was worthwhile to look into market structure changes that could make it easier to trade these stocks, allowing exchanges to innovate to serve issuers and investors and repatriate liquidity back onto exchanges.
- **Access to markets and market data** – Market participants have access to products and services providing a range of entrances to markets and market data. This roundtable explored costs, speed, and transparency around data, including the amount of SIP money collected and how much is reinvested in improving the SIP.

The third roundtable addressed **regulatory approaches to combat retail fraud.**

## Equity Market Structure Reform (2022)

https://www.sec.gov/newsroom/market-structure-proposals-december-2022

**Catalyst:** N/A; market participants do not believe there was a market event or failure warranting an overhaul of market structure at this scale. SEC Chair Gensler has not pointed to an existing problem or incident in either Reg NMS or the best execution proposal – just that the first is “old” and the other is done by FINRA (and not the SEC).

**Objective:** To modernize rules and increase transparency and fairness while increasing competition for individual investors' stock orders, or “making markets work better for everyone”, according to an SEC statement.

**Details:**

On December 14, 2022, the SEC proposed four equity market structure rulemakings. Then, on October 18, 2023, the SEC proposed a fifth rule. These rules included:

1. (Amendments to) Exchange Act **Rule 605** – adopted on March 6, 2024 – enhancing broker disclosure of order execution information. The new rule expands the scope of entities required to report to include: broker-dealers who introduce or carry 100,000 or more customer accounts; single-dealer platforms; and entities that would operate qualified auctions under the proposed Order Competition Rule. It also revises the scope and content of the information required to be included in the monthly reports, including: broadening the definition of covered order; modifying existing order size categories, basing them on round lots and including other size groups for fractional shares, odd-lots, and larger-sized orders; requiring new statistical measures of execution quality, including a size improvement benchmark calculating execution greater than the displayed size at the quote. The rule further revised report content and requires a summary report to be published.

2. (Amendments to) Exchange Act **Rules 610 and 612**, amending minimum pricing increments (tick sizes) and exchange access fee caps and enhancing the transparency of better-priced orders. This proposed rule would eliminate the current one-size-fits-all tick approach for NMS stocks priced at $1.00 or more and establish variable minimum pricing increments according to certain criteria, which would apply to the quoting and trading of NMS stocks on any national securities exchange or alternative trading system as well as over-the-counter. Given changes to tick sizes, the proposed rule also recommends recalibrating access fee caps that limit what a trading center may charge for the execution of orders against a protected quotation. The proposal would also accelerate the modified round lot definition and inclusion of odd-lot information into consolidated market data. This will be the first time the SIP introduces an odd lot NBBO, which could lead to investor confusion since it will not be protected.

3. (New) **Regulation Best Execution**, establishing a best execution standard to which broker-dealers must achieve the most favorable price for customers under prevailing market conditions. It would also require policies and procedures for certain conflicted transactions with retail customers. To some extent, the proposal mirrored existing rules from FINRA for its broker-dealer members and the Municipal Securities Rulemaking Board (MSRB) for municipal securities dealers. However, it includes a conflicted transactions

section which specifically targets payment for order flow (conflicted also includes principal trading and routing customer orders to affiliates), subjecting broker-dealers transacting with retail customers to additional best ex obligations. Further, the proposal requires exchanges disclose the fee for transactions at the time of execution, in contrast to proposal #5 below.

4. (New) **Order Competition Rule**, requiring certain retail orders to be sent to auctions or midpoint ATSs before being internalized. This proposal would require segmented orders of natural persons in Reg NMS stocks to be exposed to competition in fair and open auctions before they could be executed internally by any trading center that restricts order-by-order competition, with certain exemptions. The duration of auctions would be between 100 and 300 milliseconds (an eternity in trading terms).

5. (New) Exchange Act **Rule 6b-1**, addressing volume based exchange transaction pricing for NMS stocks. This proposal would prohibit national securities exchanges from offering volume-based transaction pricing in connection with the execution of agency or riskless principal-related orders in NMS stocks.

In addition to these five proposals/rules, participants in equity markets are dealing with a slew of other SEC proposals and issues, including but not limited to: definitions of exchange and dealer; Regulation Systems Compliance and Integrity (Reg SCI); Consolidated Audit Trail (CAT) funding; and the transition to T+1 settlement.

**Where We Stand Today** (as of the writing of this report)

These proposals/rules individually could have a significant impact on markets, let alone the aggregate impact and potential for unintended consequences of implementing all five proposals together. Where are we today in the rulemaking process? As noted above, the amendments to Rule 605 were already adopted on March 6, 2024, and market participants expect the SEC to move forward with the other proposals.

As to **Rule 605 amendments**, the industry had called for this form to be updated for many years, since it had not been substantively updated since its adoption in 2000. Given how much markets, products traded, and technologies have changed, additional transparency is seen as necessary to assess market quality. However, market participants indicate that the amount of information requested is “enormous” and the rule expanded the universe of reporting firms. Yet, the SEC made no requirement for a standardized template. As such, market participants indicate FAQ (frequently asked questions) guidance will be necessary for this rule.

Further, given the eighteen month implementation timeline for the industry – let alone time for the SEC to collect and analyze the data – this means the SEC will not use new 605 data to redo the analysis for the other proposals, as the industry had suggested.

Moving onto **Rules 610 and 612** (tick sizes and access caps), market participants expect this proposal to be finalized next. This is another one that had been under discussion by market participants for years. While the industry agrees that changes could improve market quality, there had not been agreement on the changes themselves. The industry does agree that the proposal was more aggressive than people had expected. Market participants indicate the industry has asked for a phased-in approach for this proposed rule.

For the proposed **Regulation Best Execution**, market participants believe this rule proposal remains a priority for the SEC Chair. To begin, the industry still questions why this proposed rule was necessary, given the FINRA rule

has worked well for decades. Overall, the proposed rule is considered too prescriptive, mostly relying on prevailing price and disregarding all other factors – broker-dealers know their clients and use judgement backed by experience and information on the current market environment to route orders – which could restrict broker-dealers' actions.

On the **Order Competition Rule**, market participants believe auctions may not be mandated, rather just encouraged through the best ex rule proposal. Previously, the regulatory structure allowed market participants to compete. This proposal would now force a routing path. This proposed rule could also increase the number of unfilled orders and increase operational risk and complexity given the scale of messages and surge of orders as brokers respond to multiple auctions across multiple exchanges. This would be a negative for investors.

Finally, on **Exchange Act Rule 6b-1**, the SEC had expressed concerns that volume-based exchange transaction pricing raises competitive concerns among exchange members and among exchanges. Most market participants are opposed to this proposal. Additionally, it appears to contradict the fee disclosure at time of execution requirement under the tick size proposal.

**Predictive Data Analytics (PDA)**

As mentioned above, market participants are dealing with other SEC proposals/rules. Some of these were not necessarily directed at equity trading but could have significant market impacts regardless of the intended target. One of these proposals is the PDA rule, proposed July 26, 2023. To say this proposal would impact markets is the understatement of the year.

Under the guise of slowing the adoption of artificial intelligence (AI) as it could harm investors, this proposal is incredibly, incredibly broad. However, as written, it is unclear what problem the SEC is trying to solve. It encompasses almost all forms of technology, such as websites with investment recommendations. It includes simple spreadsheets and stock screeners. None of these are viewed by industry as new or complex technologies that would warrant new regulations. As read, everything firms do appears in scope. It will impact all firms – and markets as a whole – and would have "mass" repercussions.

Additionally, conflicts have typically been handled by disclosures – and the SEC considers themselves a disclosure regulator. This rule would change that. Firms would have to neutralize or eliminate any conflicts of interest in any technology offering used to communicate with investors. For example, a presentation shows a stock chart with a trendline. The perceived conflict is that the trendline implies the stock price will keep going up. To eliminate the conflict, you can simply remove the trendline. Now it is just a factual stock chart. But what is neutralize? And why is a simple disclaimer saying historical performance is not necessarily indicative of future performance not sufficient to neutralize the conflict?

It is odd to market participants that disclosures would not be sufficient in this one instance, as they have been for so many other aspects of the financial services industry for decades.

Also of note, PDA will be reproposed according to the latest SEC Regulatory Flexibility (Reg Flex) Agenda.

## History of US Stock Exchanges and Market Events[14]

- **1790**, Board of Brokers of Philadelphia (will become the Philadelphia Stock Exchange) – This was the formation of the oldest stock exchange in the U.S.
- **1792**, The Buttonwood Agreement – This was an effort to organize securities trading in New York City, akin to their Philadelphia peers. The agreement was signed by 24 stockbrokers outside of 68 Wall Street in New York, under a buttonwood tree, and contained two provisions: (1) brokers were to deal only with each other, eliminating the auctioneers, and (2) commissions were set at 0.25%. It was the first example of self regulation.
- **1817**, New York Stock and Exchange Board (will become NYSE) – The stockbrokers in the Buttonwood Agreement instituted new reforms and reorganized, adopting restrictions on manipulative trading and formal structures of governance. The brokers began renting out exclusive space to trade securities, which previously took place at the Tontine Coffee House. Prior to settling at its current 11 Wall Street location in New York (the exchange used to have a second building at 18 Broad Street), several locations were used between 1817 and 1865.
- **1834**, Boston Stock Exchange (BX, formerly BSX or BSE) – The third oldest exchange in the U.S. opened
- **1864**, Open Board of Stock Brokers – This exchange, with a similar membership model, opened to directly compete with the NYSE
- **1864**, Oil Exchange (Pittsburgh Coal Exchange, Pittsburgh Oil Exchange; will become Pittsburgh Stock Exchange) founded
- **1865**, NYSE acquired New York Gold Exchange
- **1867**, stock tickers were introduced
- **1869**, Open Board of Stock Brokers merged with NYSE
- **1875**, Board of Brokers of Philadelphia renamed itself the Philadelphia Stock Exchange (PHLX)
- **~1880**, New Orleans stock Exchange began operating
- **1881**, Baltimore Stock Exchange opened
- **1882**, Chicago Stock Exchange (CHX) founded
- **1882**, San Francisco Stock and Bond Exchange founded
- **1884**, Washington Stock Exchange began operating
- **1885**, Cincinnati Stock Exchange founded
- **1888**, Salt Lake Stock and Mining Exchange founded (will become Intermountain Stock Exchange)

[14] Other U.S. regional stock exchanges include: Buffalo Stock Exchange, Colorado Springs Stock Exchange, Denver Stock Exchange, Detroit Stock Exchange, Hartford Stock Exchange, Honolulu Stock Exchange, Louisville Stock Exchange, Milwaukee Stock Exchange, Richmond Stock Exchange and Wheeling Stock Exchange. This section is not meant to be exhaustive of all U.S. exchanges or highlights in the history of stock markets.

- **1894**, Pittsburgh Oil Exchange rebranded as Pittsburgh Stock Exchange
- **1896**, Dow Jones Industrial Average (DJIA) was first published in The Wall Street Journal, price 40.45
- **1897**, Spokane Stock Exchange began operating
- **1899**, Cleveland stock Exchange founded
- **1899**, Los Angeles Oil Exchange founded
- **1899**, St. Louis Stock Exchange opened
- **1906**, DJIA crosses 100
- **1907**, Panic of 1907 (1907 Bankers' Panic, Knickerbocker Crisis) – This was a financial crisis lasting three weeks starting in mid-October, when the NYSE fell ~50% from last year's peak. With the country in an economic recession, panic spread and caused runs on banks and trusts. The panic was triggered by the failed attempt to corner the market on United Copper Company stock. This led to the collapse of the Knickerbocker Trust Company, New York's third largest trust, creating a domino effect of regional banks withdrawing reserves from New York City banks. Financier J.P. Morgan stepped in with other bankers to provide money to stabilize the banks. The event emphasized the inability of the country's Independent Treasury system to inject liquidity back into the market and eventually led to the creation of the Federal Reserve System.
- **1907**, the curb brokers gained rights of seniority but intentionally averted organizing to avoid authorities forcing them to sell exchange memberships
- **1908**, the New York Curb Market Agency was established, with formal trading rules for curbstone brokers
- **1910**, the informal Curb Association formed to weed out "undesirables"
- **1911**, the New York Curb Market Association was formed with a formal constitution
- **1914**, World War I stock exchange closures
- **1915**, quoting and trading in stocks changed from percent of par value to dollars
- **1920**, Wall Street bombing (outside the NYSE building)
- **1923**, Poor's Publishing introduced the Composite Index (now the S&P 500)
- **1927**, Seattle Stock Exchange began operating
- **1928**, San Francisco Stock and Bond Exchange took the name San Francisco Stock Exchange
- **1929**, Minneapolis-St. Paul Stock Exchange opened
- **1929**, New York Curb Market Agency changed its name to New York Curb Exchange
- **1929**, Wall Street Crash of 1929 (the Great Crash) – As the Roaring Twenties rolled on, the stock market soared despite the Fed's warning of excessive speculation (leading to a mini crash in March, stopped by a credit backstop by National City Bank). During the decade, the stock market had increased tenfold. Yet, the U.S. economy showed signs of trouble, with declines in steel production and auto sales, coupled with an

increase in consumer debt based on easy credit. After gaining ~20% between June and September, the market corrected in September, after financial expert Roger Babson predicted a crash. Then, on September 20, the London Stock Exchange crashed, when top British investor Clarence Hatry and many of his associates were jailed for fraud and forgery, weakening optimism and creating instability in the U.S. stock market. On October 24, the market declined but was stemmed by strategic blue chip stock buying by a group of banks. Media coverage over the weekend increased the hysteria, and the DJIA declined ~13% on October 28, Black Monday (it fell another ~12% the next day). By mid-November, the DJIA had lost almost half of its value, with the slide continuing through the summer of 1932 when the DJIA troughed 89% below its peak. The DJIA did not return to its pre-crash heights until November 1954.

- **1933**, Securities Act of 1933
- **1934**, Securities Exchange Act of 1934 and the establishment of the SEC
- **1935**, Seattle Stock Exchange merged with Seattle Curb and Mining Exchange
- **1938**, San Francisco Stock Exchange absorbed the San Francisco Curb Exchange
- **1938**, Maloney Act Amendments to the Securities Exchange Act of 1934, authorizing the formation of national securities associations to supervise the conduct of their members subject to the oversight of the SEC, i.e. self-regulatory organizations (SRO)
- **1939**, National Association of Securities Dealers established as an SRO to play a leading role in the management of stock trading in the markets
- **1942**, Seattle Stock Exchange closed
- **1949**, Philadelphia Stock Exchange and Baltimore Stock Exchange merged
- **1949**, CHX merged the St. Louis, Cleveland and Minneapolis/St. Paul exchanges to form the Midwest Stock Exchange
- **1953**, New York Curb Exchange changed its name to the American Stock Exchange (AMEX)
- **1954**, Philadelphia-Baltimore Stock Exchange merged with the Washington Stock Exchange
- **1956**, Pacific Coast Stock Exchange was formed with the merger of the San Francisco Stock and Bond Exchange and the Los Angeles Oil Exchange
- **1957**, Poor's Publishing merged with Standard Statistics Bureau and the Standard & Poors composite index grew to track 500 companies on the NYSE – now known as the S&P 500 – price 39.99 (prices were back built to 1927, 17.66)
- **1959**, New Orleans Stock Exchange merged with the Midwest Stock Exchange
- **1968**, S&P 500 crosses 100 for the first time
- **1968+**, The Paper Crisis – Equities ADV hit 12M shares per day, with piles of stock certificates and other paperwork overwhelming many Wall Street back offices, those responsible for settling and clearing trades. NYSE was forced to restrict trading to four days a week, but it was not enough to stop a flood of fails (failures by firms to receive or deliver securities within five days of a trade). Many firms lost control of their

records and costs, leading to around a sixth of all NYSE member firms disappearing either through merger or closure. Capitalizing on the confusion, organized crime syndicates made off with >$400M in stolen securities in 1971, according to the U.S. Attorney General's office.

- **1969**, Philadelphia-Baltimore-Washington Stock Exchange acquired the Pittsburgh Stock Exchange
- **1969**, Institutional Networks Corp (Instinet) founded
- **1970**, Securities Investor Protection Corporation (SIPC) established
- **1971**, National Association of Securities Dealers Automated Quotations (NASDAQ, now Nasdaq) founded as the world's first electronic stock market
- **1972**, DJIA crosses 1,000 for the first time
- **1972**, Salt Lake Stock and Mining Exchange changed its name to Intermountain Stock Exchange
- **1973**, the Pacific Coast Stock Exchange was renamed the Pacific Stock Exchange
- **1973**, The Depository Trust Company (DTC) was created to alleviate the paper crisis
- **1976**, as another solution to the paper crisis, the National Securities Clearing Corporation (NSCC) was formed to clear U.S. equities, using multilateral netting
- **1980s**, Savings and Loan Crisis – Lasting through the 1980s and into the early 1990s, more than 700 U.S. savings and loan associations failed. The S&Ls were lending long term at fixed rates using short-term money and became insolvent when interest rates rose.
- **1982**, LatAm Sovereign Debt Crisis – Mexico, Brazil and Argentina (and others) borrowed money for development and infrastructure programs, and LatAm debt roughly quadrupled in seven years. With the U.S. recession in the late 1970s, interest rates rose while LatAm currencies devalued significantly. Mexico was the first country to acknowledge it could not repay its debt, and many LatAm nations eventually received bailouts from the IMF.
- **1985,** NASDAQ-100 Index introduced
- **1986,** COMEX acquires Intermountain Stock Exchange
- **1987**, Black Monday – On October 19, 1987, the DJIA dropped 23% in the day. The Wednesday before Black Monday, the U.S. House of Representatives filed legislation to eliminate tax benefits for financing mergers. Stock values re-adjusted, as many companies were no longer viewed as takeover targets. That same day, the trade deficit for August came in notably above expectations, causing the dollar to decline as expectations increased for the Fed to tighten rates, pressuring stocks. By Thursday, markets continued to decline, with flight to safety moves as funds flowed to bonds from stocks. That Friday, many stock index options expired, and previous price movements eliminated at-the-money options preventing investors from rolling into new contracts/hedges easily. People sold futures contracts to hedge, creating a significant price discrepancy between the values of the stock index and its underlying stocks. There was substantial selling pressure on the Monday open at the NYSE. Specialists were not able to settle the imbalances, delaying the open by an hour. With the delay in trading in stocks, the futures markets opened using stale prices on the indexes. Once the NYSE opened, stock prices dropped massively.

- **1989**, Junk Bond Crisis – During this decade, junk bonds became popular for use in leveraged buyouts and as a business financing mechanism, and the market grew exponentially. While the start of the junk bond collapse is debated, it culminated with the failure of Drexel Burnham Lambert, due to its substantial participation in junk bonds. The crisis led to a recession in the U.S.
- **1991**, Spokane Stock Exchange closed
- **1993**, Midwest Stock Exchange changed its name back to CHX
- **1994**, TerraNova Trading was founded; it started excepting orders on Archipelago (an ECN) in 1997
- **1994**, Tequila Crisis – A nearly 50% devaluation in the Mexican peso (driven by a reversal in economic policy removing tight currency controls) caused interest rates to increase significantly and led Mexico to need a bailout for its bonds.
- **1996**, real-time tickers introduced
- **1998**, S&P 500 crosses 1,000 for the first time
- **1999**, DJIA crosses 1,0000 for the first time
- **1999**, The Depository Trust & Clearing Corporation (DTCC) formed as a holding company for DTC and National Securities Clearing Corporation (NSCC)
- **1997-1998**, Asia Crisis – The Thai Baht collapsed, leading to Thailand not being able to repay its debt. The crisis spread across the region, particularly South Korea, Indonesia, Laos, Hong Kong and Malaysia. This also contributed to the failure of Long-Term Capital Management, which was bailed out by the Fed and a group of banks to prevent a wider collapse of the financial markets.
- **1998**, Attain (will become Direct Edge, both ECNs) founded
- **1999-2000**, Dotcom Bubble – Following a rush into technology and Internet stocks, despite the fact that many of them made essentially no money, a slowing economy and rising interest rates forced the dotcoms to go bankrupt.
- **2000**, National Association of Securities Dealers spun off the Nasdaq Stock Market to create a publicly traded company
- **2001**, trading in fractions ($^{n}/_{16}$) replaced by decimals (increments of $0.01), or decimalization
- **2001**, September 11 terrorist attack forced stock exchange closures
- **2003**, Cincinnati Stock Exchange rebranded as the National Stock Exchange (NSX)
- **2004**, NYSE merged with Euronext, forming the first transatlantic stock exchange
- **2005**, Archipelago acquired the Pacific Exchange
- **2005**, NASDAQ acquired Insitnet (from Reuters, which acquired it in 1987); Instinet was simultaneously spun off from Nasdaq, which kept only Island, an ECN.
- **2005**, Bats Global Markets (BATS) founded

- **2006**, NYSE merged with Archipelago Exchange (ArcaEx, now NYSE Arca), an exchange on which both stocks and options are now traded
- **2007**, Nasdaq merged with OMX, a leading exchange operator in the Nordic countries and renamed itself the NASDAQ OMX Group
- **2007**, Knight Capital Group spun off Attain (which it bought two years earlier) and rebranded it as Direct Edge, as an electronic communication network
- **2007**, CBOE Stock Exchange (CBSX) launched in partnership with four liquidity providers
- **2007**, BX was purchased by NASDAQ
- **2007**, PHLX was purchased by NASDAQ
- **2007**, FINRA was formed, merging NASD and the regulation, enforcement and arbitration functions of NYSE
- **2007-2008**, Global Financial Crisis – The housing (price) bubble burst when mortgage delinquency rates began rising in August 2006. This led to a rapid devaluation of financial instruments (MBS, CDS, etc.). As values continued to quickly decline, buyers disappeared and the financial institutions holding these securities faced a liquidity crisis. It became difficult to borrow money, resulting in a decrease in home buyers and a corresponding plunging of home prices. What began with a crisis in the U.S. subprime mortgage market developed into a full-blown international financial services crisis.
- **2008**, Bats Global Markets became an operator of a licensed U.S. stock exchange
- **2008**, NYSE Euronext acquired AMEX; AMEX was integrated with the Alternext European small-cap exchange and was renamed NYSE Alternext US
- **2009**, after the DJIA reached a 12-year low at 6,547.05, it rebounded to >10,000 in October
- **2009**, NYSE Alternext US rebranded as NYSE Amex Equities
- **2010**, Direct Edge received approval to operate licensed national securities exchanges
- **2010** Flash Crash – In May 2010, the U.S. equity markets experienced a severe disruption, as a large number of stock prices suddenly dropped by significant amounts in a very short time period and then equally suddenly reversed to pre-decline levels. This led to a large number of trades being executed at temporarily depressed prices, including many that were more than 60% away from pre-decline prices.
- **2011**, Bats Global Markets acquired Chi-X Europe
- **2011**, CBSX acquired NSX
- **2012**, NYSE Amex Equities changed its name to NYSE MKT
- **2012**, Hurricane Sandy forced stock exchange closures
- **2013**, IEX (Investors Exchange) opened for trading
- **2013**, ICE acquired NYSE Euronext

- **2014**, S&P 500 crosses 2,000 for the first time
- **2014**, CBSX closed
- **2014**, NSX ceased trading operations
- **2014**, Direct Edge merged with BATS
- **2015**, NSX resumed trading operations under new ownership
- **2016**, IEX received SEC approval as an official exchange
- **2017**, NYSE MKT renamed NYSE American
- **2017**, ICE acquired NSX, rebranded as NYSE National
- **2017**, IEX received SEC approval to list companies
- **2017**, CBOE acquired BATS
- **2017**, DJIA crosses 20,000 for the first time
- **2018**, ICE acquired CHX
- **2019**, S&P 500 crosses 3,000 for the first time
- **2020**, COVID – Due to U.S. economic shutdowns in early March, trading was halted twice in the span of four days. Investors rapidly lost confidence in the market as workplaces and consumer retail areas were shut down to prevent the spread of COVID. Between February 19, 2020, and March 23, 2020, the S&P 500 dropped 1,149 points or 33.9% from 3,386.15 to 2,237.40. In light of the economic uncertainty, the Federal Reserve pledged to keep interest rates near zero through 2022 and continue its bond buying programs for the foreseeable future, creating what was called the Fed floor for markets. Additionally, the U.S. government pumped $7.1 trillion into the economy (more on this later).
- **2020**, the Members Exchange (MEMX) opened for trading
- **2020**, MIAX PEARL Stock Exchange opened for trading
- **2020**, the Long-Term Stock Exchange (LTSE) opened for trading
- **2020**, DJIA crosses 30,000 for the first time
- **2021**, DIJA crosses 35,000 for the first time
- **2021**, S&P 500 crosses 4,000 for the first time
- **2022**, monetary policy – In June, inflation hit a 40-year high of 9.0%, leading the Fed to pursue aggressive interest rate hikes. The Fed raised rates 525 bps from March 2020 to July 2023 (17 months), including four 75 bps hikes in a row in 2022.
- **2023**, regional bank turmoil – Due to rapidly rising interest rates, the value of older government bonds held by banks declined. This led some regional banks to face a liquidity crisis, forcing them to sell Treasuries at a loss. On Thursday, March 9, the stock price of the then fifteenth largest bank in the U.S. by total assets was

down 30%, eventually ending the day down 60%. That day, its customers – mostly venture capital firms and startups – began pulling their money out of the bank. By the end of the day $42 billion had been withdrawn. To put this in perspective, prior to this event, the largest bank failure occurred during the global financial crisis. At this time, it took ten days for $16 billion to leave that bank. In March 2023, the $42 billion exited in a single day, with another $100 billion slated to be withdrawn the following day. This event marked the first social media driven bank run. By the next day, the Federal Deposit Insurance Corporation (FDIC) took control of the bank. That Sunday, March 12, the FDIC took over another regional bank, also a main source of liquidity for digital asset participants. This activity created the equity markets own March madness. Some regional bank stock prices were down 20-30% at the height of the turmoil, with even some of the larger regional banks dropping 5-10%.

# Appendix: Capital Markets Terms to Know

| Statistics | |
|---|---|
| Y/Y | Year over Year |
| Q/Q | Quarter over Quarter |
| M/M | Month over Month |
| W/W | Week over Week |
| D/D | Day over day |
| YTD | Year to Date |
| QTD | Quarter to Date |
| MTD | Month to Date |
| WTD | Week to Date |
| BPS | Basis Points |
| PPS | Percentage Points |
| CAGR | Compound Annual Growth Rate |
| RHS | Right hand side (for charts) |

| Other | |
|---|---|
| AUM | Assets Under Management |
| DCM | Debt Capital Markets |
| ECM | Equity Capital Markets |

| Regulators | |
|---|---|
| North America | |
| FINRA | Financial Industry Regulatory Authority (United States) |
| SEC | Securities and Exchange Commission (United States) |
| CSC | Canadian Securities Administrators |
| European Union | |
| ESMA | European Securities and Markets Authority |
| AMF | Autorité des marchés financiers (France) |
| BaFin | Federal Financial Supervisory Authority (Germany) |
| FINMA | Swiss Financial Market Supervisory Authority (Switzerland) |
| United Kingdom | |
| FCA | Financial Conduct Authority |
| AsiaPac | |
| ASIC | Australian Securities and Investments Commission |
| CSRC | China Securities Regulatory Commission |
| SFC | Securities and Futures Commission (Hong Kong) |
| SEBI | Securities and Exchange Board of India |
| FSA | Financial Services Agency (Japan) |
| MAS | Monetary Authority of Singapore |

| Trading | |
|---|---|
| ADV | Average Daily Trading Volume |
| Algo | Algorithm (algorithmic trading) |
| ATS | Alternative Trading System |
| Best Ex | Best Execution |
| BPS | Basis Points |
| CLOB | Central Limit Order Book |
| D2C | Dealer-to-Client |
| D2D | Dealer-to-Dealer |
| ECN | Electronic Communication Network |
| ETP | Electronic Trading Platforms |
| HFT | High-Frequency Trading |
| IDB | Inter-Dealer Broker |
| IOI | Indication of Interest |
| MM | Market Maker |
| OTC | Over-the-Counter |
| SDP | Single-dealer platform |
| Bid | An offer made to buy a security |
| Ask, Offer | The price a seller is willing to accept for a security |
| Spread | The difference between the bid and ask price prices for a security, an indicator of supply (ask) and demand (bid) |
| NBBO | National Best Bid and Offer |
| Locked Market | A market is locked if the bid price equals the ask price |
| Crossed Market | A bid is entered higher than the offer or an offer is entered lower than the bid |
| Opening Cross | To determine the opening price of a stock, accumulating all buy and sell interest prior to the market open |
| Closing Cross | To determine the closing price of a stock, accumulating all buy and sell interest prior the market close |

| Order Types | |
|---|---|
| AON | All or none; an order to buy or sell a stock that must be executed in its entirety, or not executed at all |
| Block | Trades with at least 10,000 shares in the order |
| Day | Order is good only for that trading day, else cancelled |
| FOK | Fill or kill; must be filled immediately and in its entirety or not at all |
| Limit | An order to buy or sell a security at a specific price or better |
| Market | An order to buy or sell a security immediately; guarantees execution but not the execution price |
| Stop | (or stop-loss) An order to buy or sell a stock once the price of the stock reaches the specified price, known as the stop price |

| Post Trade | |
|---|---|
| DTCC | The Depository Trust and Clearing Corporation |
| CSD | Central Securities Depository |
| CCP | Central Counterparty Clearing House |
| CP | Counterparty |
| IM | Initial Margin |
| VM | Variation Margin |
| MPR | Margin Period at Risk |
| T | Trade Date |
| T+1 | Settlement Date |

| Investors | |
|---|---|
| Institutional | Asset managers, endowments, pension plans, foundations, mutual funds, hedge funds, family offices, insurance companies, banks, etc.; fewer protective regulations as assumed to be more knowledgeable and better able to protect themselves |
| Individual | Self-directed or advised investing |

| Equities | |
|---|---|
| EMS | Equity Market Structure |
| NMS | National Market System |
| Reg NMS | Regulation National Market System |
| SIP | Security Information Processor; aggregates all exchange's best quotes, sent back out to the market in one data stream |
| PFOF | Payment For Order Flow |
| Tick Size | Minimum quote increment of a trading instrument |
| CAT | Consolidated Audit Trail |
| SRO | Self Regulatory Organization |

| ETFs/Funds | |
|---|---|
| AP | Authorized Participant |
| PCF | Portfolio Composition File |
| NAV | Net Asset Value |
| IIV | Intraday Indicative Value |
| ETF | Exchange-Traded Fund |
| ETP | Exchange-Traded Product |
| MF | Mutual Fund |
| OEF | Open-End Fund |
| CEF | Closed-End Fund |
| UIT | Unit Investment Trust |

| Options | |
|---|---|
| Call | The right to buy the underlying security, on or before expiration |
| Put | The right to sell the underlying security, on or before expiration |
| Holder | The buyer of the contract |
| Writer | The seller of the contract |
| American | Option may be exercised on any trading day on or before expiration |
| European | Option may only be exercised on expiration |
| Exercise | To put into effect the right specified in a contract |
| Underlying | The instrument on which the options contract is based; the asset/security being bought or sold upon exercise notification |
| Expiration | The set date at which the options contract ends, or ceases to exist, or the last day it can be traded |
| Stock Price | The price at which the underlying stock is trading, fluctuates continuously |
| Strike Price | The set price at which the options contract is exercised, or acted upon |
| Premium | The price the option contract trades at, or the purchase price, which fluctuates constantly |
| Time Decay | The time value portion of an option's premium decreases as time passes; the longer the option's life, the greater the probability the option will move in the money |
| Intrinsic Value | The in-the-money portion of an option's premium |
| Time Value | (Extrinsic value) The option premium (price) of the option minus intrinsic value; assigned by external factors (passage of time, volatility, interest rates, dividends, etc.) |
| In-the-Money | For a call option, when the stock price is greater than the strike price; reversed for put options |
| At-the Money | Stock price is identical to the strike price; the option has no intrinsic value |
| Out-of-the-Money | For a call option, when the stock price is less than the strike price; reversed for put options |

| Equity Capital Formation | |
|---|---|
| IPO | Initial Public Offering; private company raises capital buy offering its common stock to the public for the first time in the primary markets |
| SPAC | Special Purpose Acquisition Company; blank check shell corporation designed to take companies public without going through the traditional IPO process |
| Bought Deal | Underwriter purchases a company's entire IPO issue and resells it to the investing public; underwriter bears the entire risk of selling the stock issue |
| Best Effort Deal | Underwriter only guarantees the issuer it will make a best effort attempt to sell the shares to investors at the best price possible; issuer can be stuck with unsold shares |
| Secondary | (Follow-on) Issuance of shares to investors by a public company already listed on an exchange |
| Direct Listing | (Direct placement, direct public offering) Existing private company shareholders sell their shares directly to the public without underwriters. Often used by startups or smaller companies as a lower cost alternative to a traditional IPO. Risks include, among others, no support for the share sale and no stock price stabilization from the underwriter after the share listing. |

| Underwriting | |
|---|---|
| Underwriting | Guarantee payment in case of damage or financial loss and accept the financial risk for liability arising from such guarantee in a financial transaction or deal |
| Underwriter | Investment bank administering the public issuance of securities; determines the initial offering price of the security, buys them from the issuer and sells them to investors. |
| Bookrunner | The main underwriter or lead manager in the deal, responsible for tracking interest in purchasing the IPO in order to help determine demand and price (can have a joint bookrunner) |
| Lead Left Bookrunner | Investment bank chosen by the issuer to lead the deal (identified on the offering document cover as the upper left hand bank listed) |
| Syndicate | Investment banks underwriting and selling all or part of an IPO |
| Arranger | The lead bank in the syndicate for a debt issuance deal |
| Greenshoe | Allows underwriters to sell more shares than originally planned by the company and then buy them back at the original IPO price if the demand for the deal is higher than expected, i.e. an over-allotment option |

| Documentation | |
|---|---|
| Pitch | Sales presentation by an investment bank to the issuer, marketing the firm's services and products to win the mandate |
| Mandate | The issuing company selects the investment banks to underwrite its offering |
| Engagement Letter | Agreement between issuer & underwriters clarifying: terms, fees, responsibilities, expense reimbursement, confidentiality, indemnity, etc. |
| Letter of Intent | Investment banks' commitment to the issuer to underwrite the IPO |
| Underwriting Agreement | Issued after the securities are priced, underwriters become contractually bound to purchase the issue from the issuer at a specific price |
| Registration Statement | Split into the prospectus and private filings, or information for the SEC to review but not distributed to the public, it provides investors adequate information to perform their own due diligence prior to investing |
| The Prospectus | Public document issued to all investors listing: financial statements, management backgrounds, insider holdings, ongoing legal issues, IPO information and the ticker to be used once listed |
| Red Herring Document | An initial prospectus with company details, but not inclusive of the effective date of offering price, filed with the SEC |
| Tombstone | An announcement that securities are available for sale. (Also a plaque awarded to celebrate the completion of a transaction or deal) |

| Process | |
|---|---|
| Roadshow | Investment bankers take issuing companies to meet institutional investors to interest them in buying the security they are bringing to market |
| Non-Deal Roadshow | Research analysts and sales personnel take public companies to meet institutional investors to interest them in buying a stock or update existing investors on the status of the business and current trends |
| Pricing | Underwriters and the issuer will determine the offer price, the price the shares will be sold to the public and the number of shares to be sold, based on demand gauged during the road show and market factors |
| Stabilization | Occurs for a short period of time after the IPO if order imbalances exist, i.e. the buy and sell orders do not match; underwriters will purchase shares at the offering price or below to move the stock price and rectify the imbalance |
| Quiet Period | (Cooling off period) The SEC mandates a quiet period on research recommendations, lasting 10 days (formerly 25 days) after the IPO |

| SEC Filings | |
|---|---|
| Reg S-K | Regulation which prescribes reporting requirements for SEC filings for public companies |
| Reg S-X | Regulation which lays out the specific form and content of financial reports, specifically the financial statements of public companies |
| Form S-1 | Registration statement for U.S. companies (described above) |
| Form F-1 | Registration statement for foreign issuers of certain securities, for which no other specialized form exists or is authorized |
| Form 10-Q | Quarterly report on the financial condition and state of the business (discussion of risks, legal proceedings, etc.), mandated by the SEC |
| Form 10-K | More detailed annual version of the 10Q, mandated by the SEC |
| Form 8-K | Current report to announce major events shareholders should know about (changes to business & operations, financial statements, etc.), mandated by the SEC |
| EGC | Emerging Growth Company; qualified companies may choose to follow disclosure requirements that are scaled for newly public |

| Fixed Income | |
|---|---|
| CUSIP | Committee on Uniform Securities Identification Procedures; a nine character security identifier |
| FICC | Fixed Income, Currencies and Commodities |
| FI | Fixed Income |
| TRS | Total Return Swap |

| Rates Markets | |
|---|---|
| UST | U.S. Treasury Securities |
| FRN | Floating Rate Note |
| T-Bill | U.S. Treasury Bill |
| T-Note | U.S. Treasury Note |
| T-Bond | U.S. Treasury Bond |
| TIPS | Treasury Inflation Protected Securities |
| Repo | Repurchase Agreement; also have reverse repos |
| Agency | Federal Agency Securities |
| FAMC | Farmer Mac/Federal Agricultural Mortgage Corporation |
| FCS | Farm Credit System |
| FHLB | Federal Home Loan Banks |
| FHLMC | Freddie Mac/Federal Home Loan Mortgage Corporation |
| FNMA | Fannie Mae/Federal National Mortgage Association |
| GNMA | Ginnie Mae/Government National Mortgage Association |
| TVA | Tennessee Valley Authority |

| Credit Markets | |
|---|---|
| Corporates | Corporate Bonds |
| HY | High Yield Bond |
| IG | Investment Grade Bond |
| Munis | Municipal Securities |
| GO | General Obligation Bond |
| Revenue | Revenue Bond |

| Securitized Products | |
|---|---|
| MBS | Mortgage-Backed Security |
| CMO | Collateralized Mortgage Obligation |
| CMBS | Commercial MBS |
| RMBS | Residential MBS |
| ABS | Asset-Backed Securities (auto, credit card, home equity, student loans, etc.) |
| CDO | Collateralized Debt Obligation |

| Money Markets (MM) | |
|---|---|
| CP | Commercial Paper |
| ABCP | Asset-Backed Commercial Paper |
| MMF | Money Market Funds |

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- Global Equity Market Comparison
- Capital Formation & Listings Exchanges
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- The ABCs of Equity Market Structure: How US Equity Markets Work and Why
- Analyzing the Meaning Behind the Level of Off-Exchange Trading, Part II
- Analyzing the Meaning Behind the Level of Off-Exchange Trading
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