# SIFMA Insights

## US Equity Market Structure Analysis

*Why Market Structure and Liquidity Matter*

**September 2021**

### Key Takeaways

In a post-Reg NMS world, one unintended consequence is the rise of fragmentation, complicating equity market structure & leading market participants to wonder if changes are necessary. Market structure matters as it can drive liquidity and trade costs. As such, market participants continually strive to create the most efficient markets. Inside this note we assess:

- Liquidity & Trade Costs: Market liquidity is the ability to efficiently buy/sell securities without causing a substantial change in the price of the asset and is important as it impacts trade costs and therefore affects returns to investors.
- Market Landscape: When routing an order, whether directly to an exchange or executed off exchange, firms balance likelihood of execution against price/size improvement. (Also includes a look at market participants.)
- Role of Market Makers: Market makers exist to provide liquidity in securities and execute trades, playing an important role in equity market structure by enabling the smooth flow of markets.

# Contents

**For further details and additional information on the functioning of capital markets, please see the SIFMA Insights Market Structure Primer Series:**

- Global Capital Markets & Financial Institutions Primer (https://www.sifma.org/resources/research/capital-markets-financial-institutions-primer/)
- Primary, Secondary & Post-Trade Markets (https://www.sifma.org/resources/research/insights-primary-secondary-post-trade-markets-primer/)
- Sector Specific (www.sifma.org/primers): Electronic Trading; US Equity Capital Formation & Listings Exchanges; US Equity; US Multi-Listed Options; US ETFs; and Evolution of the Fintech Narrative

SIFMA Insights can be found at: www.sifma.org/insights

**Disclaimer: This document is intended for general informational purposes only and is not intended to serve as investment advice to any individual or entity.**

SIFMA is the leading trade association for broker-dealers, investment banks and asset managers operating in the U.S. and global capital markets. On behalf of our industry's nearly 1 million employees, we advocate on legislation, regulation and business policy, affecting retail and institutional investors, equity and fixed income markets and related products and services. We serve as an industry coordinating body to promote fair and orderly markets, informed regulatory compliance, and efficient market operations and resiliency. We also provide a forum for industry policy and professional development. SIFMA, with offices in New York and Washington, D.C., is the U.S. regional member of the Global Financial Markets Association (GFMA). For more information, visit http://www.sifma.org.

# Executive Summary

In a post Regulation National Market System (NMS) world, one unintended consequence is the rise of fragmentation, perhaps too much fragmentation given there are now 16 exchanges, 33 alternative trading systems (ATS), and multiple over-the-counter (OTC) venues. This forces traders to balance the likelihood of certainty of execution against potential price and size improvement and other transaction costs when choosing an execution venue. As such, this has complicated U.S. equity market structure, leading market participants to wonder if changes are necessary.

Market structure can drive liquidity and trade costs. Therefore, market participants continually strive to create the most efficient markets. This includes adapting new technologies to achieve operational efficiencies, searching for new ways to transact and, generally, sculpting market structure to maximize efficiencies. In this note, we look at how market structure matters to achieving high levels of market liquidity and minimizing trade costs.

- **Market Liquidity** – Market liquidity is the ability to efficiently buy or sell securities without causing a substantial change in the price of the asset (stable prices), as measured by speed and ease of execution. Markets need robust trading volumes to remain liquid, as liquidity is tied to price volatility. Wide swings in prices can limit demand for the securities, keeping volumes depressed. Lower volumes lead to increased time to execute a trade and wider bid-ask spreads – a measure of market liquidity – which increases costs to trade.
- **Trade Costs** – Market liquidity is important as it impacts the costs to trade and therefore affects returns to investors. Higher spreads lead to higher transaction costs which cut into an investor's return. Total trade costs can be split into: explicit (broker commissions, market access fees, transaction costs, clearing and settlement costs, taxes) and implicit (bid-ask spreads, opportunity cost, price impact of a trade).
- **Order Routing** – Fragmentation in U.S. equity markets forces traders to balance the likelihood of execution against potential price and size improvement and other transaction costs when choosing an execution venue. Traders must balance the cost of not filling the order with the potential for price or size improvement. Firms have built technologies to address market fragmentation and seek out hidden liquidity to achieve best execution of trades on behalf of their clients. When routing an order, a broker can either send the order directly to an exchange (on exchange) or it can execute institutional and retail trades on a bilateral basis (off exchange).
- **Market Participants** – Capital markets connect those needing capital (corporations) with providers of capital (investors). These relationships are facilitated by various financial institutions and equity exchanges: listing and trading exchanges; off-exchange venues; short-term holders of stocks; and liquidity providers.
- **Market Makers** – Market makers must make two-sided markets at all times, no matter what the market environment. Even when markets become volatile or fall under extreme stress, market makers must continue facilitating the flow of liquidity in markets. In short, market makers play an important role in U.S. equity market structure by enabling the smooth flow of markets.

# Market Structure Matters

## Market Liquidity

Market liquidity is the ability to efficiently buy or sell securities without causing a substantial change in the price of the asset (stable prices), as measured by speed and ease of execution. Market liquidity impacts everything from the bid-ask spread (difference between the highest price that a buyer is willing to pay for an asset and the lowest price that a seller is willing to accept, an important variable in calculating the total cost of a trade) to the ability to execute a trade. Liquidity is a tradeoff between speed of execution and transaction costs. For example, a market participant may accept a less optimal price in order to execute the trade in a timely manner. Additionally, others look at liquidity as the ability to quickly and easily convert the security to cash. If it is difficult to convert an asset into cash, then the market is considered illiquid.

Markets need robust trading volumes to remain liquid, as liquidity is tied to price volatility. In a less liquid market, there are not as many buyers and sellers. As such, large transactions may lead to large price movements, increasing price volatility. Typically, security prices represent the estimated value based on fundamental analysis. When market participants see market prices move outside of their estimated price range, they step in to buy or sell the security. These actions adjust the price back to fair value accordingly. However, in illiquid markets, low demand leads to fewer transactions, hindering traders' ability to execute quickly and cost efficiently. Fewer market participants mean traders are not there to step in and adjust prices (or at least not as quickly as in liquid markets). Therefore, prices can experience wide swings.

This can further limit demand for the securities, keeping volumes depressed. Lower volumes lead to increased time to execute a trade and wider bid-ask spreads – a measure of market liquidity – which increases costs to trade. Additionally, lower liquidity increases risk – lack of liquidity is known as liquidity risk – as traders cannot quickly open and close their positions.

| Liquid Markets | Illiquid Markets |
|---|---|
| High demand for a security | Low demand for a security |
| Many buyers and sellers | Fewer buyers and sellers |
| Frequent trading | Infrequent trading (trading by appointment) |
| Narrower bid-ask spreads | Wider bid-ask spreads |
| Security easily converted to cash | Security not easily converted to cash |

While on the whole equitiy markets are considered to be liquid markets, the liquidity of individual stocks can vary. Stocks trading on exchanges will generally be more liquid than those traded over the counter. Many other factors also come into play, including a stock's: market cap, float size (number of shares available for trading), inclusion in an index, investor demand, etc. Large cap stocks have a market cap of $10 billion or more, and are typically blue-chip companies with established revenue and earnings. They are transparent, enabling ease of analysis by investors, and they often pay dividends, depending upon business model. Mid cap stocks have market caps between $2 billion and $10 billion. Small cap stocks – which can also be well-established companies, not necessarily startups – have market caps between $300 million and $2 billion. (Stocks can also be classified as mega cap, greater than $200 billion, micro cap, less than $300 million, or nano cap, less than $50 million.) Smaller cap stocks are traded less frequently than large caps, lowering liquidity and making prices more volatile.

## Trade Costs

As described above, market liquidity is important as it impacts the costs to trade and therefore affects returns to investors. Higher spreads lead to higher transaction costs which cut into (decrease) an investor's return. Lower liquidity can also increase the cost of capital raising for corporations and governments.

The calculation for total trade costs is:

**Trade Costs = ∑ (Explicit Costs + Implicit Costs)**

| Cost Type | Cost Examples |
|---|---|
| Explicit | Broker or dealer commissions: Fees to cover trade execution expenses; may provide reasonable profit for executing the trade; add a premium for the risk that they may lose money executing the transaction; cover costs to hold the inventory of securities to make markets (supply of securities; capital required to be held against these securities); cover costs of staff and technology; etc. |
| | Market access fees |
| | Transaction costs: Fees paid for accessing liquidity are added to trade costs; rebates received for adding liquidity are subtracted from trade costs |
| | Clearing and settlement costs |
| | Taxes (includes SEC Section 31 fees, financial transaction taxes) |
| | |
| 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: |
| | (a) Losses can occur from market prices moving when executing large volumes; block trades are often performed off exchange to lessen this price impact |
| | (b) Information leakage occurs when other market participants learn a player 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 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 |
| | (c ) In some markets, including in the U.S., brokers are required to seek the best execution price 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 |

### More on Bid-Ask Spreads

A bid-ask spread is the amount by which the ask (sell) price exceeds the bid (buy) price for a security in the market, or the difference between the highest price that a buyer is willing to pay and the lowest price that a seller is willing to accept. The bid represents the demand for the security, and the ask represents the supply of a security. The spread is the transaction cost. Price takers, the traders, buy at the ask price and sell at the bid price, and, as the counterparty to the trade, the market maker buys at the bid price and sells at the ask price.

Bid-ask spreads are a measure of market liquidity. As the liquidity of a security increases, the bid-ask spread usually tightens, decreasing trade costs. And, vice versa, higher spreads mean higher costs.

## Putting It All Together

Putting together these pieces – achieving high levels of market liquidity and minimizing trade costs – shows that market structure matters. Market structure can drive liquidity and trade costs. As such, market participants continually strive to create the most efficient markets.

This includes adapting new technologies to achieve operational efficiencies, searching for new ways to transact and, generally, sculpting market structure to maximize efficiencies.

# US Equity Market Structure

## Background on Order Routing

U.S. equities that are traded on a national securities exchange can trade on one of the 16 exchanges or over-the-counter (OTC), known as off exchange trading.[1] Off-exchange trading can take place on alternative trading systems (ATS), which anonymously match trades and are an important source of market liquidity. ATS are regulated by the SEC for their execution of exchange listed stocks under Regulation ATS, and, in 2018, the SEC adopted Form ATS-N to create greater public disclosure about certain ATS, i.e. increase transparency. Off-exchange trading can also occur through a network of market makers and broker dealers trading as principal, including wholesalers who execute retail flow. Why trade exchange listed stocks off exchange one may ask. Traders choose a venue by balancing timing, costs, anonymity, etc.; for example, institutional investors prefer to make block trades off exchange for the pre-trade anonymity and potential price stability provided.

Of note, when taking place off exchange, trades are still reported to the consolidated tape and, in accordance with FINRA requirements, must take place at the best price reasonably available, typically at or inside the bounds of the current national best bid and best offer (NBBO) on all trading venues. Under Reg NMS, applicable to exchange listed stocks, the order protection rule (Rule 611) mandates trades be executed at the best displayed price. A trading venue cannot “trade through” (ignore) a better displayed quote, rather it must route the trade to the venue displaying the better quote or execute the trade at a better price (price improvement). Hidden orders are not protected and can be ignored, even if at a better price (as can manual quotes, those not published on an electronic trading system). This heightens the importance of price and speed ahead of all other best execution factors (fill rates, etc.), which can actually increase trade costs.

Fragmentation in U.S. equity markets – 16 exchanges, 33 alternative trading systems (ATS), multiple over-the-counter (OTC) venues – forces traders to balance the likelihood of certainty of execution against potential price or size improvement and other transaction costs when choosing an execution venue. Exchanges offer pre-trade transparency but may not provide the trader with sufficient liquidity. Off-exchange trading venues may not offer pre-trade transparency, meaning the quantity of shares available for execution could be uncertain, depending upon the execution venue. (For example, retail firms meet regularly with market makers to determine what price/size improvement they will receive based on the price and liquidity of a stock, eliminating the uncertainty when executing with these firms and, thereby, ensuring best execution for their customers.) Risk neutral traders must balance the cost of not filling the order with the potential for price or size improvement, the cost-immediacy tradeoff. Firms have built technologies to address market fragmentation and to seek out hidden liquidity to achieve best execution of trades on behalf of their clients.

---

[1] This differs from OTC equities, which are stocks not listed on an exchange for various reasons. These stocks must trade off exchange, since they are not listed, instead trading directly through a network of market makers or broker-dealers. Our description and assessment of U.S. equity market structure covers only exchange listed stocks, those falling under Reg NMS, not over-the-counter (unlisted) equities

Order routing, or the path the broker can take to execute a trade, is the process by which an order goes from the investor through to execution. After an investor places a trade, the order goes to a broker. If the order is marketable[2], the broker will look at the size of the order and determine the path to achieve best execution, considering the liquidity of the stock being traded and other factors. If the order is non-marketable, the order will be displayed on an exchange, consistent with FINRA's order handling rules.

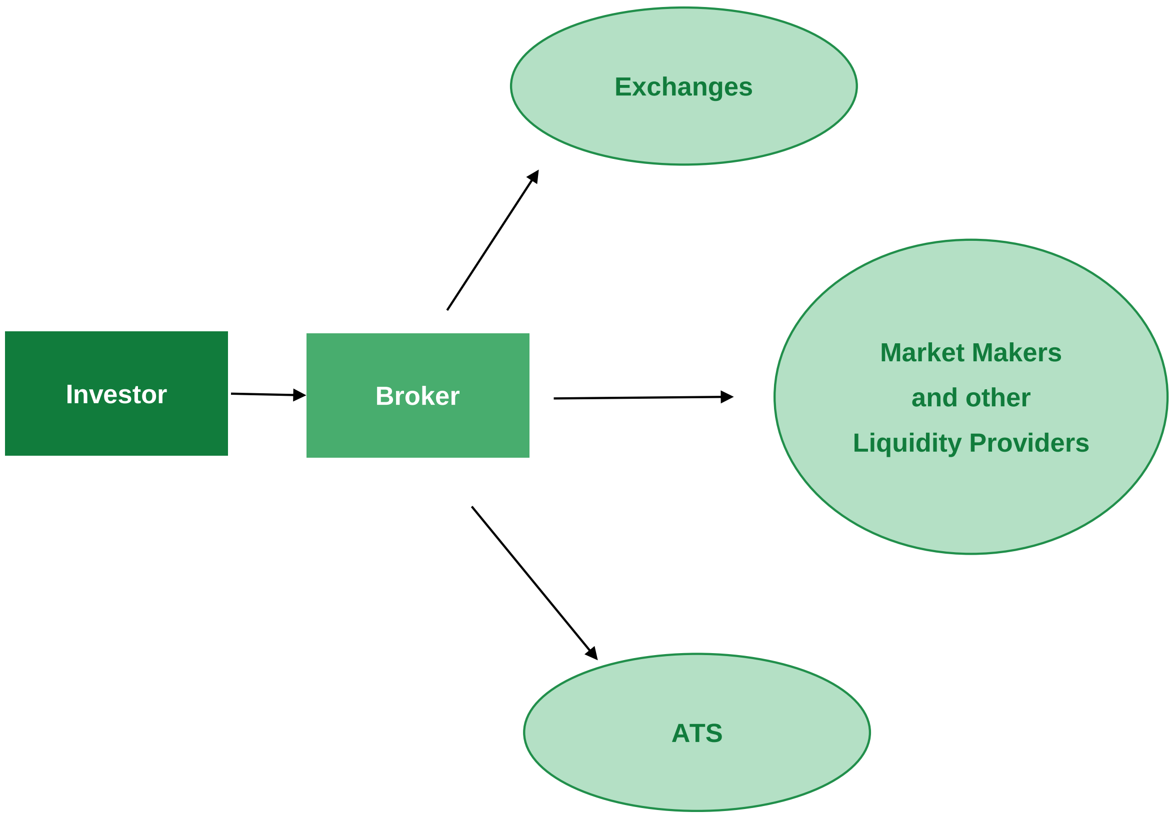
This path to achieve an execution can vary, but best execution is always paramount. When receiving a customer order, if a broker elects to route the order to a venue other than a market maker for immediate execution, that broker must search buy/sell interest on all 16 exchanges, 33 ATS, and multiple OTC venues. When finding the best venue that meets the customer's demands – for example, a customer may prioritize speed of execution over price – the broker will route the order to that venue. The executing venue, whether exchange, market maker or other liquidity provider, looks at the NBBO as the benchmark for best execution, since the broker is obligated to either execute at the protected quote price or improve it.

Order routing options for the broker include (visual on next page):

- **On Exchange** – A broker can send the client's order direct to the exchange
- **Off Exchange** – A broker can execute institutional and retail trades on a bilateral basis, through high-touch block trading, by trading at the midpoint, through spread trading, etc.
    - Liquidity Providers – A broker can fill a client's order from its own inventory of stocks (internalization), making for faster and cheaper execution, or it can send the order to another execution venue
    - Market Makers – A broker can send orders to market makers, who stand ready to buy/sell stocks on a continuous basis, as they are obligated to maintain a two sided quote at all times

[2] A marketable order is eligible for immediate execution based on current market conditions. Non-marketable orders are not immediately executable for various reasons: the limit price is outside the current market, it was an all or none trade and the quantity is not available in the market, etc.

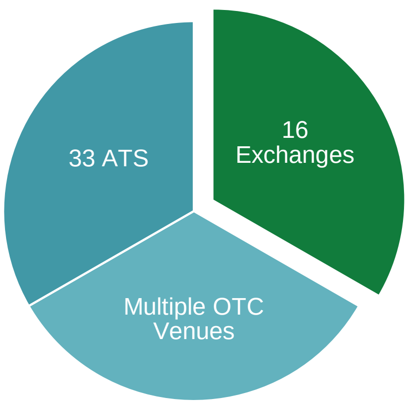
**Order Routing Flow[3]**

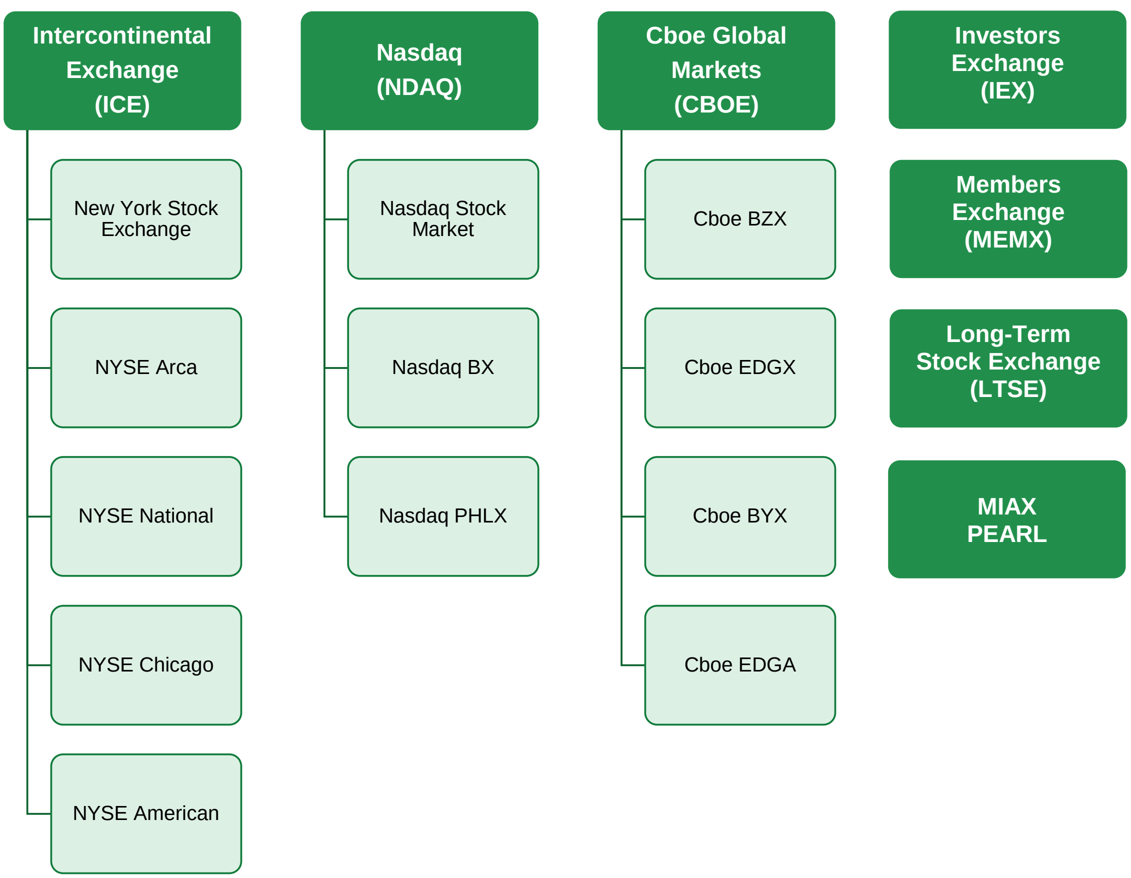



[3] Single-dealer platforms (SDP) are included in the market maker and other liquidity providers bubble. An SDP is an execution venue that provides a broker dealer with access to the firm's principal liquidity.

## US Equity Market Structure Landscape

- On Exchange – 16 Exchanges (7 parent groups)
- Off-exchange – 33 ATS, multiple OTC venues (please see Appendix for a list of venues)



## A Look at Market Participants

Capital markets connect users of capital with providers of capital, and these relationships are facilitated by various financial institutions and equity exchanges. We assess the following relationships and roles of market participants:

**Needing Capital** – Issuers, corporations in the equity markets, looking to raise capital offer their stock (common, preferred) to the investing public in either initial public offerings (IPO) or follow-on offerings (secondaries)
U.S. stock market cap $47 trillion, 39.2% of the $120 trillion global equity market cap[4]

**Connecting the Dots** – While investors have money to offer corporations, there is a whole ecosystem connecting the parties:

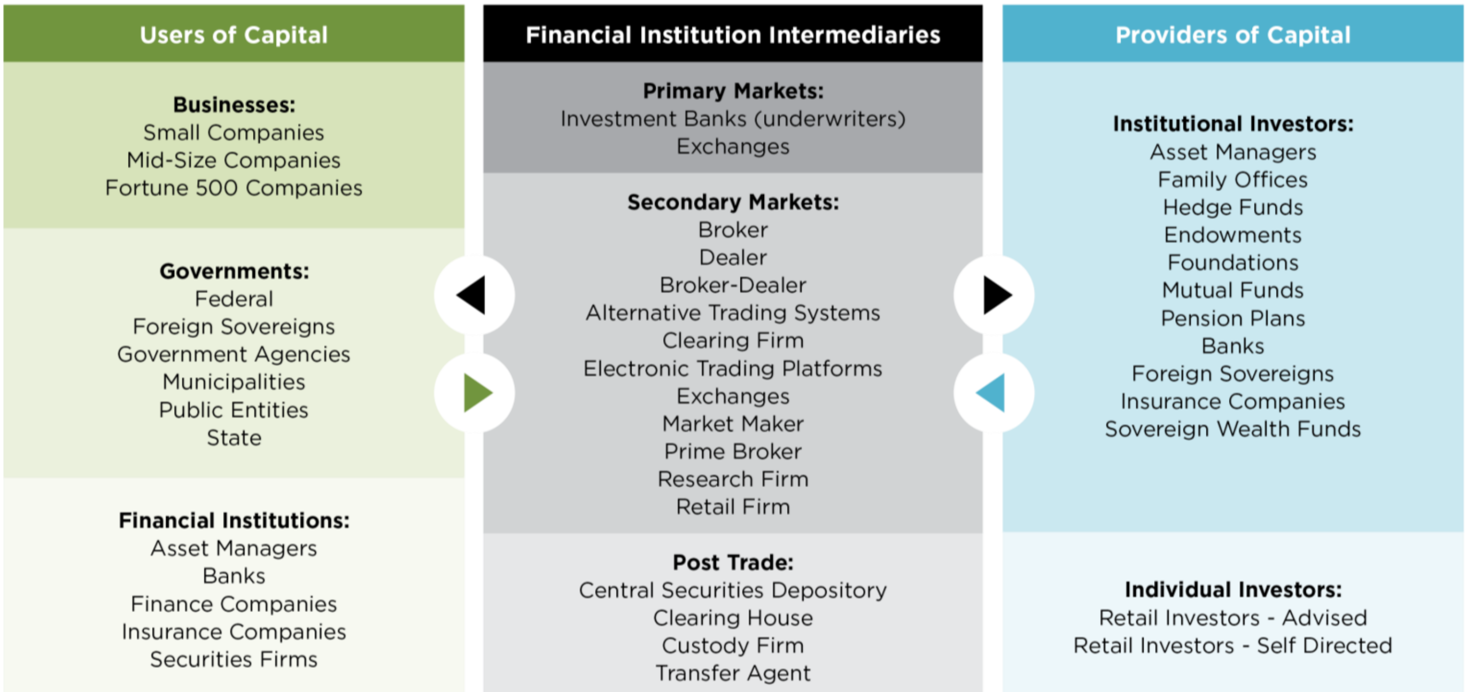
- Exchanges – As part of the plumbing of the capital markets ecosystem, exchanges play a role in the functioning of both the primary and secondary markets.
    - Primary – There are two listings exchanges for corporations, Nasdaq and NYSE, while ETFs are listed on Nasdaq, NYSE Arca and Cboe. There are 4,147 domestic listed companies and 2,404 U.S. ETFs[5].
    - Secondary – There are 16 exchanges, under 7 parent groups.
- Off-Exchange Venues – There are 33 ATS and multiple OTC venues, operated by banks and broker-dealers (of which there are 3,435 FINRA-registered broker-dealers[6]).
- Efficiency[7] – Short-term holders of stocks, either for investment, trading, or risk management, help maintain cheap liquidity and market efficiency (the degree to which market prices reflect all available, relevant information).
    - Market makers – Enable regular and continuous trading as counterparties to those wishing to buy or sell stocks.
    - Hedge funds, arbitragers, etc. – Hold long and short positions at the same time (ex: pair trading), which keeps stocks efficiently priced.
- Liquidity[8] –
    - Market makers – Provide liquidity by creating a two-sided market.
    - Banks, broker-dealers – Contribute to liquidity and capital formation.

**Providing Capital** – In order to raise capital, corporations need long-term investors. There are institutional (ex: asset managers) and individual (retail) investors.
Households, or retail, owned 39.7% of equities, followed by 27.2% in mutual funds, ETFs and closed end funds and 10.2% in private and government pension funds

---

[4] Source: SIFMA Research (2Q21)
[5] Source: SIFMA Research, ETFGI Research (2Q21). NYSE is a subsidiary of Intercontinental Exchange (ICE). Cboe Global Markets lists its own stock
[6] Source: SIFMA Research (FY20)
[7] Source: Nasdaq Economic Research

### Market Participant Groupings




Please see Capital Markets Primer Part II: Primary, Secondary & Post-Trade Markets for more information on the roles of market participants and functioning of markets.

## Role of Market Makers

According to Section 3(a)(38) of the Securities Exchange Act of 1934, the term market maker means any specialist permitted to act as a dealer, any dealer acting in the capacity of block positioner, and any dealer who, with respect to a security, holds himself out (by entering quotations in an inter-dealer communications system or otherwise) as being willing to buy and sell such security for his own account on a regular or continuous basis. Market makers can be a standalone firm – such as one whose business model focuses predominantly on making markets and providing execution services – or a broker-dealer that provides capital commitment and trading services for investors. Regardless of firm type, market makers exist to provide liquidity in securities and execute trades both on and off national securities exchanges.

All market makers actively quote two-sided markets in a stock – or regularly and continuously hold themselves out if not necessarily quoting, as can be the case with wholesalers – providing bids (buys) and asks (sells) along with the market size (volume) they are willing to trade for each. Market makers are mandated to be willing buyers/sellers at the NBBO for all exchange listed stocks in which they make a market. Market makers must also commit their own capital to enable transactions and can maintain an inventory of the stocks in which they make a market, ensuring their ability to quickly facilitate executions in their quoted names. Once an order is received from a buyer, the market maker immediately uses shares from its own inventory, or shorts the stock, to complete the order. This maintains sufficient liquidity in markets and creates efficiencies in trading stocks.

Market makers come in all types and must fulfill all sorts of obligations, regardless of how they are defined. In short, market makers play an important role in U.S. equity market structure by enabling the smooth flow of markets.

**Requirements**: The SEC requires all market makers to display customer limit orders that (a) are priced better than a market maker's quote or (b) add to the size associated with a market maker's quote when the market maker is at the best price in the market on a national exchange. Equity market makers must also operate under the bylaws of each exchange on which it operates, with rights and responsibilities varrying by exchange. For exchange market makers, their execution obligations are around their assigned stock(s) listed on that specific exchange. The two listing exchanges have different requirements for a firm to be defined as an exchange market maker. Nasdaq market makers display buy/sell interest in their registered Nasdaq, NYSE and other listed securities in which they make a market. Nasdaq's market structure requires a minimum of three – or four, depending upon the criteria – market makers in each single stock. NYSE differs in that it has designated market makers (DMMs, formerly called specialists) acting as the official market maker for a given NYSE-listed stock, i.e. there is only one DMM for a stock.

**Inventories**: In order to maintain the flow of markets, the role of a market maker is to provide liquidity by acting as a counterparty for incoming orders. Accordingly, market makers must accumulate inventory, either long or short. They are compensated for the risk of holding inventories – there could be a decline in the price of a stock after it has been purchased from a seller but before it is sold to a buyer – by charging a spread on each trade. For example, with a bid price of $100 and an ask price of $100.02, the bid-ask spread is $0.02. While a small amount of money on its face, market makers perform a high-volume of trades each day, enabling them to generate profits.

**No Off Day**: All market makers must make two-sided markets at all times, no matter what the market environment. Even when markets become volatile or fall under extreme stress, market makers must continue facilitating the flow of liquidity in markets.

# Appendix: ATS List

To generate a proxy list, we use the FINRA ATS transparency data for trading of Reg NMS stocks.

| Name | MPID | Name | MPID |
|---|---|---|---|
| UBS ATS | UBSA | CODA | CODA |
| SIGMA X2 | SGMT | INSTINET BLOCKCROSS | BLKX |
| CROSSFINDER | CROS | DEALERWEB | DLTA |
| JPM-X | JPMX | MS RPOOL (ATS-6) | MSRP |
| LEVEL ATS | EBXL | CBX | ICBX |
| MS POOL (ATS-4) | MSPL | LIQUIDNET H2O ATS | LQNA |
| IBKR ATS | IATS | LIQUIDNET NEGOTIATION ATS | LQNT |
| THE BARCLAYS ATS | LATS | LUMINEX ATS | LMNX |
| BIDS ATS | BIDS | CITIBLOC | CBLC |
| INTELLIGENT CROSS LLC | INCR | USTOCKTRADE SECURITIES, INC. | USTK |
| VIRTU MATCHIT ATS | KCGM | AQUA | AQUA |
| INSTINCT X | MLIX | INSTINET CROSSING | XIST |
| SUPERX ATS | DBAX | XE | PJCX |
| MS TRAJECTORY CROSS (ATS-1) | MSTX | TZERO ATS, LLC | PROS |
| CROSSSTREAM | XSTM | BOATS | BLUE |
| POSIT | ITGP | STIFEL X | STFX |
| JPB-X | JPBX | | |
| **TOTAL** | **33** | | |

Source: FINRA (as of 2Q21, list may vary each quarter)

# Appendix: OTC Venue List

There are multiple OTC venues executing trades for exchange listed stocks. To generate a proxy list, we use the FINRA OTC (Non-ATS) block data download (aggregated trade data in NMS stocks reported to the FINRA equity trade reporting facilities: Alternative Display Facility and Trade Reporting Facilities). We do note that not all of these transactions, and therefore not all of these venues, involve cutomer trades, as some of these venues may have executed only proporietary trades.

| Name | Name | Name |
|---|---|---|
| A.G.P. / ALLIANCE GLOBAL PARTNERS | CANACCORD GENUITY LLC | ELEVATION, LLC |
| ACS EXECUTION SERVICES, LLC | CANTOR FITZGERALD & CO. | EVERCORE GROUP L.L.C. |
| AEGIS CAPITAL CORP. | CAPITAL INSTITUTIONAL SERVICES, INC. | EXANE, INC. |
| ALLEN & COMPANY LLC | CELADON FINANCIAL GROUP LLC | FBN SECURITIES, INC. |
| ALPACA SECURITIES LLC | CHARLES SCHWAB & CO., INC. | FIRST BALLANTYNE, LLC |
| ALTERNATIVE EXECUTION GROUP | CHURCHILL CAPITAL USA, INC. | FIS BROKERAGE & SECURITIES SERVICES LLC |
| AMERICAN CAPITAL PARTNERS, LLC | CIBC WORLD MARKETS CORP. | FLOW TRADERS U.S. INSTITUTIONAL TRADING LLC |
| AMERICAN ENTERPRISE INVESTMENT SERVICES INC. | CITADEL SECURITIES LLC | FLOW TRADERS U.S. LLC |
| AMERICAN VETERANS GROUP, PBC | CITIGROUP GLOBAL MARKETS INC. | FOG EQUITIES LLC |
| AXOS CLEARING LLC | CJS SECURITIES, INC. | G1 EXECUTION SERVICES, LLC |
| B. RILEY SECURITIES, INC. | CLARKSONS PLATOU SECURITIES, INC. | GFI SECURITIES LLC |
| BARCLAYS CAPITAL INC. | CLEAR STREET LLC | GLENDALE SECURITIES, INC. |
| BAY CREST PARTNERS, LLC | CLEARPOOL EXECUTION SERVICES, LLC | GMS GROUP |
| BCP SECURITIES, LLC | CLSA AMERICAS, LLC | GOLDMAN SACHS & CO. LLC |
| BERENBERG CAPITAL MARKETS LLC | COLLIERS SECURITIES LLC | GTS SECURITIES LLC |
| BGC FINANCIAL, L.P. | COMHAR CAPITAL MARKETS, LLC | GUGGENHEIM SECURITIES, LLC |
| BMO CAPITAL MARKETS CORP. | COMPASS POINT RESEARCH & TRADING, LLC | HILLTOP SECURITIES INC. |
| BNP PARIBAS SECURITIES CORP. | COWEN AND COMPANY | HOLD BROTHERS CAPITAL LLC |
| BNY MELLON CAPITAL MARKETS, LLC | CRAIG-HALLUM CAPITAL GROUP LLC | HOVDE GROUP, LLC |
| BOENNING & SCATTERGOOD, INC. | CREDIT SUISSE SECURITIES (USA) LLC | HRT EXECUTION SERVICES LLC |
| BOFA SECURITIES, INC. | D.A. DAVIDSON & CO. | HSBC SECURITIES (USA) INC. |
| BOK FINANCIAL SECURITIES, INC. | DAIWA CAPITAL MARKETS AMERICA INC. | HUATAI SECURITIES (USA), INC. |
| BROAD STREET CAPITAL MARKETS, LLC | DASH FINANCIAL TECHNOLOGIES LLC | I-BANKERS SECURITIES, INC. |
| BROWNSTONE INVESTMENT GROUP, LLC | DEUTSCHE BANK SECURITIES INC. | ICAP CORPORATES LLC |
| BTG PACTUAL US CAPITAL, LLC | DRIVEWEALTH INSTITUTIONAL LLC | IMC FINANCIAL MARKETS |
| BTIG, LLC | DRIVEWEALTH, LLC | IMPERIAL CAPITAL, LLC |
| C. L. KING & ASSOCIATES, INC. | E D & F MAN CAPITAL MARKETS INC. | INCAPITAL LLC |
| C6 CAPITAL SECURITIES LLC | E*TRADE SECURITIES LLC | INSTINET, LLC |
| CABRERA CAPITAL MARKETS, LLC | EDWARD JONES | INTERACTIVE BROKERS LLC |

Source: FINRA (as of June 2021, list may vary each month)

| Name | Name | Name |
|---|---|---|
| ITAU BBA USA SECURITIES, INC. | NATIXIS SECURITIES AMERICAS LLC | STEPHENS |
| J.P. MORGAN SECURITIES LLC | NEEDHAM & COMPANY, LLC | STIFEL, NICOLAUS & COMPANY, INCORPORATED |
| J.V.B. FINANCIAL GROUP, LLC | NOMURA SECURITIES INTERNATIONAL, INC. | STOCKPILE INVESTMENTS, INC. |
| JANE STREET CAPITAL, LLC | NORTHERN TRUST SECURITIES, INC. | STONEX FINANCIAL INC. |
| JANE STREET EXECUTION SERVICES, LLC | NORTHLAND SECURITIES, INC. | SUSQUEHANNA FINANCIAL GROUP, LLLP |
| JANNEY MONTGOMERY SCOTT LLC | ODEON CAPITAL GROUP LLC | SVB LEERINK LLC |
| JEFFERIES LLC | OLD MISSION MARKETS LLC | TD AMERITRADE CLEARING, INC. |
| JMP SECURITIES LLC | OLIVETREE FINANCIAL, LLC | TD SECURITIES (USA) LLC |
| JONESTRADING | OPPENHEIMER & CO. INC. | THE BENCHMARK COMPANY, LLC |
| JOSEPH GUNNAR & CO. LLC | OSCAR GRUSS & SON INCORPORATED | THE VERTICAL GROUP |
| JWTT INC. | OTA LLC | THEMIS TRADING LLC |
| KEEFE, BRUYETTE & WOODS, INC. | PAULSON INVESTMENT COMPANY LLC | TJM INVESTMENTS, LLC |
| KEPLER CAPITAL MARKETS, INC. | PENSERRA SECURITIES, LLC | TOURMALINE PARTNERS, LLC |
| KEYBANC CAPITAL MARKETS INC. | PIPER SANDLER & CO. | TRADITION SECURITIES AND DERIVATIVES LLC |
| LADENBURG THALMANN & CO. INC. | PNC INVESTMENTS | TRC MARKETS LLC |
| LAKE STREET CAPITAL MARKETS, LLC | PRECISION SECURITIES, LLC | TRUIST SECURITIES, INC. |
| LEK SECURITIES CORPORATION | PUMA CAPITAL, LLC | TUDOR, PICKERING, HOLT & CO. SECURITIES, LLC |
| LIBUCKI & CO., LLC | QUATTRO M SECURITIES INC. | TULLETT PREBON FINANCIAL SERVICES LLC |
| LIQUIDNET, INC. | R. F. LAFFERTY & CO., INC. | TWO SIGMA SECURITIES, LLC |
| LPL FINANCIAL LLC | R. SEELAUS & CO., LLC | UBS FINANCIAL SERVICES INC. |
| LPS CAPITAL LLC | R.W.PRESSPRICH & CO. | UBS SECURITIES LLC |
| LUMINEX TRADING & ANALYTICS LLC | RAYMOND JAMES & ASSOCIATES, INC. | UNITED FIRST PARTNERS LLC |
| MACQUARIE CAPITAL (USA) INC. | RBC CAPITAL MARKETS, LLC | USCA SECURITIES LLC |
| MARKET SECURITIES, LLC | REDBURN (USA) LLC | VANGUARD MARKETING CORPORATION |
| MAXIM GROUP LLC | ROBERT W. BAIRD & CO. INCORPORATED | VELOCITY CLEARING, LLC |
| MCAP LLC | ROBINHOOD SECURITIES, LLC | VIRTU AMERICAS LLC |
| MESIROW FINANCIAL, INC. | ROSENBLATT SECURITIES INC. | WALL STREET ACCESS |
| MIZUHO SECURITIES USA LLC | ROTH CAPITAL PARTNERS, LLC | WALLACHBETH CAPITAL LLC |
| MKM PARTNERS LLC | SAFRA SECURITIES LLC | WATERMILL INSTITUTIONAL TRADING LLC |
| MOMENTUM INDEPENDENT NETWORK INC. | SAGETRADER, LLC | WEDBUSH SECURITIES INC. |
| MONNESS CRESPI HARDT & CO., INC. | SAMI BROKERAGE LLC | WELLINGTON SHIELDS & CO., LLC |
| MORGAN STANLEY | SANFORD C. BERNSTEIN & CO., LLC | WELLS FARGO CLEARING SERVICES, LLC |
| MORGAN STANLEY & CO. LLC | SANTANDER INVESTMENT SECURITIES INC. | WELLS FARGO SECURITIES, LLC |
| MORGAN WILSHIRE SECURITIES, INC. | SCOTIA CAPITAL (USA) INC. | WILLIAM BLAIR |
| MUFG SECURITIES AMERICAS INC. | SEAPORT GLOBAL SECURITIES LLC | WILLIAM O'NEIL SECURITIES |
| MURIEL SIEBERT & CO., INC. | SG AMERICAS SECURITIES, LLC | WILLIAMS TRADING LLC |
| NASDAQ EXECUTION SERVICES, LLC | SIDOTI & COMPANY, LLC | WILSON-DAVIS & CO., INC. |
| NATALLIANCE SECURITIES, LLC | SIEBERT WILLIAMS SHANK & CO., LLC | WOLVERINE EXECUTION SERVICES, LLC |
| NATIONAL FINANCIAL SERVICES LLC | SRT SECURITIES LLC | XP INVESTMENTS US, LLC |
| NATIONAL SECURITIES CORPORATION | STATE STREET GLOBAL MARKETS, LLC | XTELLUS CAPITAL PARTNERS, INC. |
| | | XTX EXECUTION SERVICES LLC |

Source: FINRA (as of June 2021, list may vary each month)

# Appendix: Terms to Know

| | |
|---|---|
| EMS | Equity Market Structure |
| NMS | National Market System |
| Reg NMS | Regulation National Market System |
| SIP | Security Information Processor |
| PFOF | Payment For Order Flow |
| Tick Size | Minimum price movement of a stock |
| CAT | Consolidated Audit Trail |
| SRO | Self Regulatory Organization |
| FINRA | Financial Industry Regulatory Authority |
| SEC | Securities and Exchange Commission |

| | |
|---|---|
| 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 |
| Dark Pool | Private trading venues, not accessible by the public |
| 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 |
| SI | Systematic Internaliser |

| | |
|---|---|
| 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 a few minutes before the market open |
| Closing Cross | To determine the closing price of a stock, accumulating all buy and sell interest a few minutes before 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 |

## Appendix: SIFMA Insights Research Reports

Monthly Market Metrics and Trends: www.sifma.org/insights-market-metrics-and-trends

- Statistics on volatility and equity and listed options volumes
- Also highlights an interesting market trend

SIFMA Insights Market Structure Primers: www.sifma.org/primers

- Capital Markets Primer Part I: Global Capital Markets & Financial Institutions
- Capital Markets Primer Part II: Primary, Secondary & Post-Trade Markets
- Electronic Trading
- US Capital Formation & Listings Exchanges
- US Equity
- US Multi-Listed Options
- US ETF
- US Fixed Income
- SOFR: The Transition from LIBOR
- The Evolution of the Fintech Narrative

SIFMA Insights: www.sifma.org/insights

- Market Structure Survey: Volatility, Volumes, Market Levels & Retail Investor Participation
- SPACs versus IPOs
- A Look Back at 2020 Market Structure Themes
- US Capital Formation’s 2020 Journey
- Market Structure Download: Post-Election Update
- Market Performance Around US Presidential Elections
- Market Volatility Around US Presidential Elections
- Market Structure Download
- A Deeper Look at US Listed Options Volumes
- The Cboe Trading Floor Reopened – Revisiting Volume Data
- NYSE Goes All Electronic – What Does It Mean?
- The NYSE Trading Floor Reopened – Revisiting Market Share Data
- COVID-19 Related Market Turmoil Recap: Part I (Equities, ETFs, Listed Options & Capital Formation)
- 2020, the Year of the SPAC
- The 2020 Market Madness
- The VIX's Wild Ride
- The 10th Anniversary of the Flash Crash
- DTCC's Important Role in US Capital Markets

## Author

**SIFMA Insights**
Katie Kolchin, CFA
Director of Research
kkolchin@sifma.org