

# Mark-to-market structure: An end-investor perspective on the evolution of developed equity markets



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## Introduction

Equity markets play a vital role in the economy, allowing companies to access capital from a broad range of investors, while providing a means for end-investors to grow their savings. Over recent decades, equity market structure has changed dramatically in ways that have greatly benefitted both these end-beneficiaries. A modern equity ecosystem has emerged that makes greater use of technology, and is more efficient than ever before.

While these developments have on the whole improved the functioning of equity markets, policy makers continue to evaluate how the regulatory environment should keep pace with this evolution. In this *ViewPoint*, we highlight several key principles that should inform future regulation. We then apply a regional lens, putting forward specific recommendations to improve the quality of equity markets in the US and the EU.

## Modern equity markets

Equity markets have experienced material transformation over the past few decades due to advances in technology and the adoption of new regulation, such as Regulation National Market System (Reg NMS) in the US, and the Markets in Financial Instruments Directive and Regulation (MiFID / MiFIR) in the EU. These drivers have increased the speed and automation of markets, fostered the emergence of new venues and market participants, and helped facilitate the growth of exchange-traded funds (ETFs). We break down these trends below:

**Electronification.** Advances in computing capability have been fundamental drivers of developments in equity markets. Manual means of transacting equities have largely given way to electronic solutions for order transmission and execution. Individual clicks and voice tasks can be carried out electronically, ensuring safer workflows and a more consistent investor experience. The resulting increase in connectivity and speed has made markets more accessible, and paved the way for greater use of automation. While broadly positive in reducing costs and increasing access for the end-investor, electronification can create new challenges to market resilience, and may require additional guardrails.

**New market participants.** Regulatory responses to the global financial crisis brought increases in bank capital requirements and limitations to proprietary trading, reducing the market making appetite of traditional broker-dealers. This dynamic has, in part, fostered the entrance of new market participants – such as Electronic Liquidity Providers (ELPs) – which are proprietary trading firms that have developed better tools to manage and automate traditional market making. We view the increased diversity of liquidity providers as a net positive for market quality and liquidity. The increased prominence of new participants also brings a set of new issues to monitor.

**Competition, fragmentation and complexity.** Over the past two decades, we have witnessed increased competition between trading venues, with new firms and business models challenging incumbent players. In many respects, this has been beneficial, reducing costs and spreads while increasing choice for investors. However, it has also created fragmentation, as activity is increasingly spread across numerous venues. In the US, for example, market participants must connect to 13 exchanges and 47 active alternative trading systems (ATSs). In the EU, while MiFID II and MiFIR have catalysed an effort to harmonize rules across Member States, liquidity has fragmented across multiple trading venues and jurisdictions. Fragmentation and complexity are likely to continue as an ongoing challenge, with significant further policy work and industry-driven initiatives necessary to complete EU Capital Markets Union (CMU).

**Exchange Traded Funds (ETFs).** All of the above factors have combined to facilitate the growth of ETFs. Advances in technology and data management have allowed the systematic investment processes utilized by ETFs to take place on a large scale, and therefore at increasingly low cost. In addition, electronic market makers are integral to supporting an efficient ETF arbitrage mechanism. ETFs

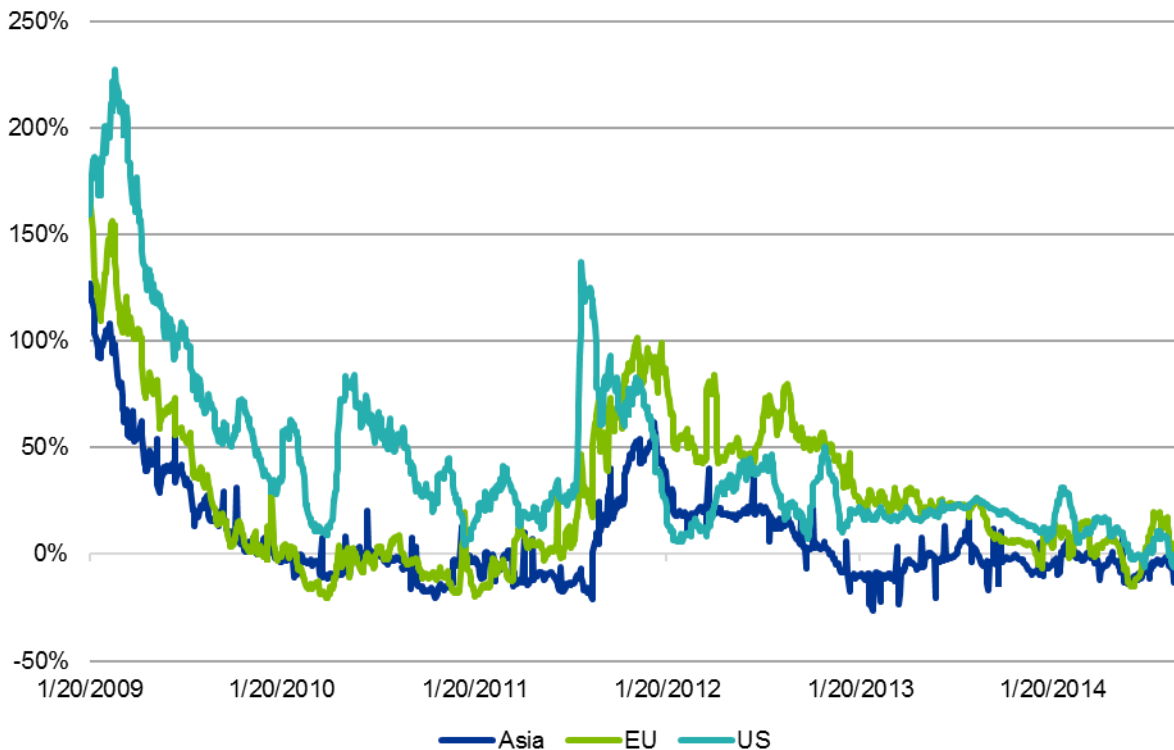
have changed the way individuals and institutions invest, and are now core building blocks of investor portfolios. The current popularity of ETFs is primarily due to their role as a low cost, transparent, and accessible market exposure vehicle for a range of end investors.

Overall, these developments have benefitted end investors through deeper and more liquid equity markets, but with change of this magnitude we should consider whether regulation has kept pace. US and EU regulators have largely succeeded in developing deep and liquid equity markets, but there is room for improvement.

At the same time, modern equity markets are complex with issues tightly interwoven with one other. Policymakers should tread carefully and seek to avoid unintended consequences from well-intentioned regulation. In this paper, we highlight several key principles that should guide regulators as they look to the future of global equity markets.

While these global themes have relevance in equity markets around the world, regulation typically happens at the national level, and different markets are at various stages in their development. In the remainder of this paper, we take a regional lens to each of the global themes, looking specifically at the US and the EU.

**Figure 1: Global transaction costs by region (indexed to Q3 2014)**



Source: Morgan Stanley Electronic Trading

## Recommendations for refining US and EU market structure

Equity markets have evolved dramatically in response to new regulations and advances in technology. The changes in market structure have primarily been beneficial for end-investors by improving market quality and lowering transaction costs. However, new challenges accompany these developments and we believe that the additional recommendations outlined below would help to make equity markets fairer and more effective. We see the strengthening of transparency – in particular in Europe – as the foundation for driving further growth of electronic trading, increasing execution efficiencies, and extending these benefits to Exchange Traded Funds.

### US

#### **Expand National Market System Plan governance to broaden participation**

The shift from stock exchanges as member owned entities to public listed companies has not been fully reflected in the regulatory regime. Including a more diverse set of market participants in National Market System Plan governance will make regulation less partial and more representative.

#### **Improve latency and data coverage of the consolidated tape**

The co-existence of the consolidated tape and proprietary exchange data feeds gives rise to concerns about a two-tiered system, with some market participants lacking access to timely or comprehensive market data. Launching competing or geographically distributed Securities Information Processors (SIPs) would reduce concerns about latency, and policymakers should consider expanding the data available through the SIP to reduce the reliance on proprietary feeds.

#### **Refine existing standards for market resiliency mechanisms**

It is important to consider how the market resiliency mechanisms interact with each other. Experience has shown that improper calibration and harmonisation of mechanisms can exacerbate market stress. Stock-specific halts should not interfere with market-wide halts, and should be aligned with erroneous execution rules.

### EU

#### **Deliver a consolidated tape for trades and quotes**

ESMA should take the lead in providing a pan-European consolidated tape solution, as an authoritative source of post-trade information. This would increase transparency, strengthen best execution, and improve competitiveness.

#### **Introduce an official European Best Bid and Offer (EBBO)**

Pre-trade transparency could be strengthened via an EBBO equivalent to the US' National Best Bid and Offer (NBBO). Many market participants use a self-calculated EBBO, but there is no prescribed standard, as in the US.

#### **Allow midpoint executions in any size and venue**

EU policymakers are increasingly focused on shifting trading activity towards venues with high pre-trade transparency (such as traditional stock exchanges and some Multilateral Trading Facilities). We disagree with the assumption that this improves transparency and price formation, and emphasise the cost benefit to end-investors from trading at midpoint.

#### **Clarify the scope of the Share Trading Obligation**

The Share Trading Obligation has created some confusion over whether shares with primary listings outside of the EEA must be traded on EEA venues. This requirement could force firms trading non-EEA stocks to execute trades away from the primary, lower-cost, source of liquidity – to the detriment of EU investors. We recommend that regulators clarify that the STO is limited to stocks with primary liquidity in the EEA.

#### **Focus future regulatory debate on benefits to end-investors**

Mechanisms such as the 'Double Volume Cap' place restrictions on 'dark' trading venues, assuming that they detract from price formation and liquidity provision. Regulators should take a less direct stance in trying to shift liquidity from dark to lit markets, focusing instead on contribution to liquidity and benefit the end-investor.

#### **Adopt minimum standards for market resiliency mechanisms**

Experience in the US has shown that market resiliency mechanisms that are not properly harmonised and calibrated with one another can worsen market stress. Controls should be automated and we recommend minimum standards around trade suspensions, cancellations, and auction processes.

## Principles for modern equity market structure regulation

- 1. Promote innovation and encourage fair competition while moderating increasing complexity.** While competition can be beneficial for markets, a cost is borne by investors to connect to a vast array of venues and to fully understand the complexity in the market. Further, rapid change and innovation may lead to misaligned incentives and new conflicts of interest. Today, equity markets in the US and Europe have become fragmented and complex. Regulators should look to moderate this trend while not impeding innovation.
- 2. Ensure equal and sufficient access to market data.** Market data integrity serves as the foundation for investor protection and public confidence in markets. A publicly available, aggregated view of the market is a fundamental requirement in today's fragmented and complex equity markets. Market data must be timely, accurate, and delivered on an equitable and efficient basis. As such, regulators should recognize the potential conflicts of interest and governance concerns that may arise from private or proprietary market data products competing with a public feed. Having disparate feeds with multiple protocols and channels for transmitting data may contribute to difference in data speeds, creating the perception of a two-tiered ecosystem for market data.
- 3. Improve disclosure and investor education.** An investor's ability to navigate modern markets is hindered by complexity and fragmentation. It is difficult to have full oversight of the trading process when the data is incomplete or the trading practises of brokers or venues are opaque. As such, regulators should focus on improving disclosure and investor

education, to empower market participants with the ability to evaluate their options and make informed investment decisions. Disclosures should be meaningful, clear, and easily comparable.

- 4. Establish consistent standards for price formation and market resiliency across the equity ecosystem.** Equity markets function smoothly and efficiently the vast majority of the time. However, examples of short-lived market stress highlight the need to develop robust mechanisms across both equity markets and related markets (such as those for equity derivatives), to ensure resilience when markets are volatile. Clear and consistent rules help to avoid confusion and uncertainty during times of stress. Individual controls or market mechanisms (such as single stock controls and market-wide circuit breakers) should be complementary and act in harmony. This is particularly important where stocks are traded across borders, with differing national regimes.
- 5. Ensure applicability of rulesets to ETFs.** ETFs have become a valuable tool used in a variety of institutional and retail investor portfolios. Many regulations were written prior to ETF adoption, and so do not contemplate ETFs. However, regulators are increasingly recognising the importance of rules tailored specifically to ETFs (such as the US ETF Rule proposal or the inclusion of ETFs in MiFID). Market structure rules are further behind in this regard and we encourage regulators to revisit existing rules with a view to explicitly contemplate ETFs. In addition, a global classification scheme for ETPs would help differentiate traditional ETFs from other ETPs that have different structural features and risks.

## US market structure

The most consequential development in the US equity market has been the creation of the National Market System (NMS). In the 1970s, policymakers envisioned that new technologies available for data processing and communications would enable all markets to be linked into a unified framework that would foster efficiency, competition, and transparency. In 1975, Congress directed the SEC to

establish a National Market System through amendments to the Securities and Exchange Act. The NMS was intended to: (i) promote efficient execution of securities transactions, (ii) encourage fair competition, (iii) facilitate the availability of information to investors, (iv) ensure brokers could execute investor orders in the best market, and (v) provide an opportunity for orders to be executed without the participation of a broker.<sup>1</sup>

**Figure 2: US equity market structure priorities and principles**

	Innovation & Competition vs Complexity	Equal Access to Market Data	Disclosure and Investor Education	Price Formation & Market Resiliency	Applicability of Rulesets to ETFs
Expand NMS Plan governance to broaden participation	✓	✓	✓	✓	✓
Improve latency and data coverage of the consolidated tape		✓		✓	✓
Refine existing standards for market resiliency mechanisms			✓	✓	✓

In the late 1990s, as new electronic communication systems began to compete with traditional exchanges, the SEC adopted Regulation Alternative Trading Systems (Reg ATS) and decimalized tick sizes to bring these new venues into the NMS. The SEC further strengthened and modernized the NMS with the introduction of Regulation National Market System (Reg NMS) in 2005. Table 1 provides a summary of key provisions in Reg NMS. Reg NMS formalized rules regarding the use of NMS Plans to expand upon the core

mechanisms of the central marketplace. Reg NMS ushered in a new era of electronic trading and intense competition among venues through automated execution and stronger linkages across markets. As shown in Figures 3 and 4, market share of incumbent trading venues such as NYSE and NASDAQ subsequently declined sharply. This has culminated in a fragmented US equity market, which today is comprised of 13 stock exchanges, 47 active equity ATSS, and over 200 over-the-counter market makers.<sup>2</sup>

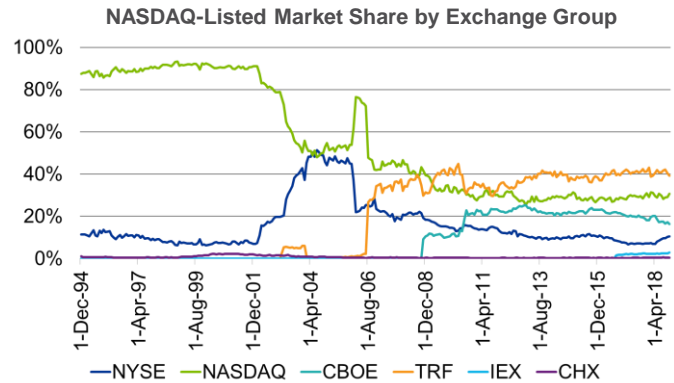
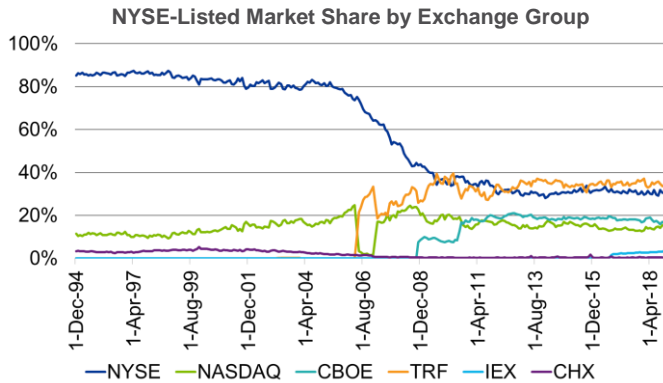
**Table 1: Key features of Regulation National Market System**

<b>1. Order Protection Rule (OPR)</b>	The OPR protects against 'trade-throughs' (situations where an exchange executes at a price inferior to the best possible price quotes on other exchanges). While venues often had protections in place to guard against them, the OPR is substantially tougher, requiring trading venues to establish, maintain, and enforce written policies.
<b>2. Access Rule</b>	The Access Rule underpins the OPR, recognising that protecting the best displayed prices against trade-throughs does not work if trading venues cannot access those prices fairly and efficiently. Hence, fees trading venues can charge for accessing 'protected quotations' are limited at \$0.003 per share, establishing an outer limit on the cost of accessing protected quotations.
<b>3. Sub-Penny Rule</b>	The Sub-Penny Rule aims to promote price transparency, consistency, and foster depth and liquidity of markets, by requiring quotations for NMS stocks to be priced in increments of no less than \$0.01 (or \$0.0001 where a stock trades for \$1 or less).
<b>4. Market Data Rules and Plans</b>	The Market Data Rules and Plans aim to promote the original objective, set out in 1975, that consolidated market data should "form the heart of the National Market System", and that the data should be affordable and useful to investors. At a high level, the amendments: <ul style="list-style-type: none"> <li>a) Altered the revenue allocation formula for market data to shift emphasis from number of trades on an exchange to the exchange's contribution to the best quotes displayed in equities.</li> <li>b) Gave non-exchange entities the scope to give their views on Plan business prior to decisions being made.</li> <li>c) Authorised exchanges to distribute their own data independently, whilst still contributing to consolidated data.</li> </ul>

Source: US Securities and Exchange Commission<sup>3</sup>



**Figures 3 and 4: Trading of NYSE and NASDAQ listed equities by exchange**



Source: Credit Suisse

The US equity market is one of the best functioning and most efficient in the world as a result of these changes. Trading costs for investors have steadily declined and are among the lowest in the world. The US equity market is not in need of wholesale change and regulators should take care to avoid harming an already well-functioning market. That said, we have a number of recommendations to continue to improve market quality and protect end-investors.

### National Market System Plan governance

At the inception of the NMS, the SEC was given authority to delegate aspects of NMS governance to stock exchanges, who would act as ‘Self-Regulatory Organizations’ (SROs). Specifically, the SEC can “authorize or require [SROs] to

act jointly with respect to ... planning, developing, operating or regulating a national market system (or subsystem thereof) or one or more facilities thereof.”<sup>4</sup>

The tradition of self-regulation is grounded in the principle of cooperative regulation between the industry and government. Self-regulation is believed to benefit from “the expertise and intimate familiarity with complex securities operations which members of the industry can bring to bear on regulatory problems.”<sup>5</sup>

However, since the early 2000s, stock exchanges have transitioned from member owned entities to public companies, while maintaining their status as SROs. They therefore maintain a role as both for-profit companies and arbiters of key aspects of equity market regulation, their

### SEC access fee pilot

Access fee caps were originally established through Rule 610 of Reg NMS to ensure that brokers would have fair and non-discriminatory access to protected quotations on an exchange.<sup>6</sup> Until recently, the cap of 30 cents per 100 shares, set in 2005, had not changed, while commissions and spreads decreased significantly. Evolution in pricing structures also led to the emergence of new maker-taker venues, driving exchanges to increase rebates that maximize incentives to attract liquidity.<sup>7</sup> The fee disparity between posting an order and removing liquidity from an exchange could be as wide as 0.5 or 0.6 cents per share. These anachronistically large fees (or rebates) represented a significant cost (or inducement) in the ecosystem, and posed a conflict for broker dealers between achieving best execution for clients and lowering their own costs.<sup>8</sup>

We therefore welcome the SEC’s recent decision to conduct a transaction fee pilot, which will implement a varied reduction in the access fee cap, measuring the impact of fees and rebates on liquidity and routing

behaviour.<sup>9</sup> Lowering the fee cap will reduce the distortive effect that rebates, fees, and pricing tiers have on order routing behaviour. It may also encourage trading activity to migrate onto exchanges from off-exchange venues by eliminating cost as a factor in routing decisions. In line with the principle of reducing complexity whilst promoting competition, this will improve the quality of displayed liquidity on exchanges. Reduced price differentiation may induce some exchanges or ATSS to consolidate or cease operations, which would help mitigate the excessive market fragmentation, complexity, and costs for investors.

However, it is important to note that a one-size-fits-all model is unlikely to be appropriate for all stocks. Rebates may have a beneficial impact on price discovery, liquidity, and spreads for more thinly traded stocks. The optimal solution may be a multi-tiered model where fees and rebates are determined by the liquidity, price, or bid-ask spread of a security.

members, and the wider equity ecosystem. This transition has not been fully reflected in the regulatory regime. Given the significant changes to equity market structure and participants, stock exchanges are now less representative of the wider industry, but exercise disproportionate influence on the design and operation of the NMS Plans.

We therefore believe that **NMS Plan governance should be broadened to include a more diverse set of market participants, including broker-dealers, investors, issuers, and vendors. Further, equitable voting representation should be given to these participants**, to empower them to affect NMS Plan decisions. This would make NMS Plans better informed and more impartially operated.

### Market data

Recognising that market data would “form the heart of the national market system”, US policymakers granted the SEC “pervasive rulemaking power” to make consolidated market information available to all investors.<sup>10</sup> The NMS plans established centralized Securities Information Processors (SIPs) that collect data from trading venues, aggregate the information, and disseminate a consolidated market data feed to the public.

The resulting framework is recognized as “an essential element in the success of the US securities market”; it allows transparency of buying and selling interest, monitoring of different market centres, and facilitates broker-dealers’ best execution requirements.<sup>11</sup> However, recent trends in the cost of data, availability of competing products, and advances in technology have impacted the quality of the SIPs and eroded public confidence in the market.

Today, exchanges sell direct or proprietary market data feeds alongside the core data that they provide to the SIPs. Proprietary data streams are a relatively new development that were not in existence when the SIPs were created, and as such are not governed by the same NMS Plan structure. Direct feeds only carry data from a specific venue or exchange group, but offer additional information which is not on the public feed, such as depth-of-book, odd-lot quotes, and auction imbalance data. This information makes proprietary streams exceptionally valuable for automated trading systems and market participants seeking to fulfil their best execution obligations for customers.

Proprietary data feeds compete directly with the SIPs and are generally subject to less latency (i.e. deliver market data faster), which is a significant concern for market participants due to the emphasis on speed in modern equity markets.<sup>12</sup> Recent upgrades to SIP infrastructure have dramatically reduced latency via data processing improvements.<sup>13</sup> However, differences in communication protocols and connectivity options available for the SIP and direct feeds

continue to contribute to discrepancies in latency. Further, the most significant source of latency stems from the physical topology of exchanges; SIP subscribers are subject to the additional transmission time caused by broadcasting data from geographically dispersed data centers to or from a centralized SIP.<sup>14</sup> Proprietary feeds, by comparison, are consumed directly from the exchange so that no non-essential routes are introduced in the delivery of data.

Providing proprietary market data streams alongside a public data feed creates incentives that are incompatible with promoting fair and orderly markets. Industry concerns about SIP performance and a two-tiered playing field for market data are predominately due to the co-existence of private feeds – using their own protocols and technology – with the SIP. There is significant value to the additional data available on proprietary feeds – many consider this data essential to remaining competitive and providing best execution for clients.

**The SEC should pursue reforms that level the playing field by encouraging the launch of competing or more geographically distributed SIPs**, which would lessen the timing disparity between SIP data and direct data feeds. To improve the governance of market data and eliminate the inherent conflicts of interest from competing products, **the SEC should consider whether the additional information currently available via proprietary feeds, such as auction imbalances, odd-lot quotes, or depth-of-book data should be made available as part of the SIP infrastructure.**

### Market resiliency mechanisms

The developments that have made markets more efficient have also transformed the market risks. Electronification and automation present new challenges for markets, and we have seen several stress tests resulting from technical errors, or volatility in pricing and liquidity conditions. Faster and more interconnected markets have moreover reduced the response times of market participants. Extraordinary market volatility has the potential to undermine investor confidence and negatively impact the operation of fair and orderly markets.

As such, regulators have rightly focused on developing market mechanisms to stabilize markets during periods of stress. Volatility safeguards typically constrain price moves within pre-defined thresholds. They may also seek to halt or slow trading in order to provide market participants time to reassess economic conditions and replenish liquidity. It is crucial that volatility controls are properly calibrated to strike the right balance between preventing aberrant trades and unnecessarily impeding market access or interfering with the price discovery.

The US equity market has three major mechanisms in place to manage price dislocations and extreme volatility:

- **Market-Wide Circuit Breakers (MWCB)** are a set of coordinated exchanges procedures designed to halt trading on a market-wide basis for both securities and futures, in order to stabilize markets and permit liquidity to replenish after a large market decline. Halts can be triggered at three different levels depending upon the single-day decrease in the S&P 500 index: Level 1 (7% decline), Level 2 (13% decline), and Level 3 (20%). If a Level 1 or 2 Halt is triggered before 3:25 PM, market-wide trading will be halted for 15 minutes. If a Level 3 Halt is triggered at any time during the day, market-wide trading will cease for the rest of the day.<sup>15</sup>
- **Limit Up-Limit Down (LULD)** mechanisms were established by an NMS Plan to prevent trading in an individual security from occurring outside of specified price bands above and below the average price over the preceding five minutes. LULD price bands are also coupled with trading pauses and dynamic re-opening procedures designed to better accommodate fundamental price moves and order imbalances. Securities are generally classified as Tier 1 with 5% price bands or Tier 2 with 10% price bands, based on volume and index membership; some low priced stocks have bands of 20%, 75%, or \$0.15. LULD price bands are doubled during the opening and closing periods of the trading day.<sup>16</sup>
- **Clearly Erroneous Execution (CEE)** rules are specified by trading venues, governing the review and possible cancellation of trades. CEE rules help exchanges to manage the risks that obviously incorrect trades may pose to maintaining fair and orderly markets or protecting the public interest. After the 2010 Flash Crash, CEE rules were revised to create more objective standards and consistent numerical guidelines to reduce exchange discretion and provide more clarity regarding the CEE review process. CEE thresholds during regular trading hours are 10% for stocks priced less than \$25.01, 5% for stocks priced between \$25.01 and \$50, and 3% for stocks priced greater than \$50; different thresholds exist for multi-stock events and leveraged ETP products.

While it is appropriate to have robust controls in place, it is also important to consider how they interact with one another, to ensure that they do not worsen any market volatility, or prevent the efficient functioning of markets. In particular, market-wide and stock-specific controls should complement rather than interfere with one another. The former is appropriate for instances when normal market mechanisms are not working; the latter for idiosyncratic, stock-specific events. For example, on August 24 2015, nearly 1,300 LULD halts were triggered, causing a deterioration in market quality and transparency.<sup>17</sup> Where a large number of LULD halts have been triggered, the MWCB may be impaired as the S&P 500 index may be distorted. Further, the MWCB may be a better tool to stabilize markets for a widespread volatility event. **Policymakers should examine how the LULD controls should optimally interact with the MWCB mechanism; policymakers should also consider doubling LULD bands during market-wide events to avoid interference.**

The 2010 Flash Crash prompted regulators to provide clarity regarding trade cancellation procedures and reduce the uncertainty posed by exchange discretion around cancellations.<sup>18</sup> Market participants need to have confidence that their trades and associated hedges will stand: they face unhedged risks if some portion of their trades are cancelled. When securities are able to trade at prices which fall within erroneous trade guidelines, certainty of execution is absent and market makers may be inclined to reduce trading rather than risk exposure to subsequent trade cancellations. This is particularly important during times of stress when liquidity provision is most critical. Currently, CEE rules are not harmonised with LULD price bands; in some instances the threshold to trigger a CEE cancellation is smaller than that of the stock's LULD band. As a result, market makers are less willing to provide a bid, making the market less liquid and more fragile. CEE and LULD mechanisms should be harmonised to avoid exacerbating uncertainty and volatility. This may require revisions to existing thresholds to ensure they are adequately tailored to the volatility of the instrument.



## The growth of ETPs and the need for a classification system

The ETF market has grown substantially, with global ETF assets under management reaching \$5.1 trillion at the end of September 2018.<sup>19</sup> Global investors are increasingly using ETFs as tools for both long-term and tactical investing. Studies by Greenwich Associates show that institutional users currently allocate an average of 15% of their assets into ETFs.<sup>20</sup>

Exchange Traded Product (ETP) is a generic term for any portfolio exposure product that trades on an exchange. ETFs, ETCs, ETNs and ETIs are all subsets of ETPs. Often, the terms ETP and ETF are used interchangeably. While these two investment vehicles share one common trait – they are traded on an exchange – they can have very different embedded structural risks. A clear-cut ETP naming convention would better serve investors by providing greater clarity on the specifics of these products, and help regulators focus their efforts.

BlackRock defines an ETF as a publicly offered investment fund that:

1. trades on an exchange
2. tracks underlying securities of stocks and bonds, or other investment instruments
3. does not have leveraged or inverse features.

A standard global classification system, such as the one shown in Table 2, governed by regulatory or standard setting bodies would not only benefit investors by setting clear expectations about the inherent risks of a product, but could also assist regulators in developing appropriate rules in each jurisdiction.

**Table 2: ETP classification system**

<b>ETP</b>	<b>Exchange-Traded Product</b>	<ul style="list-style-type: none"> <li>• Generic term for any portfolio exposure product that trades on an exchange.</li> <li>• ETFs, ETCs, ETNs and ETIs are all subsets of ETP.</li> </ul>
<b>ETF</b>	<b>Exchange-Traded Fund</b>	<ul style="list-style-type: none"> <li>• ETFs are publicly-offered investment funds that trade on an exchange.</li> <li>• ETFs can be passive or active, if they meet diversification and liquidity thresholds set by regulators and exchanges.</li> <li>• ETFs' underlying securities can include stocks, bonds or other investment instruments.</li> <li>• ETFs may purchase the underlying securities or other instruments directly or create exposure or hedge using futures, swaps and options.</li> <li>• This category should exclude ETIs, as defined below.</li> </ul>
<b>ETN</b>	<b>Exchange-Traded Note</b>	<ul style="list-style-type: none"> <li>• Debt instruments that provide an index-based return. ETNs may or may not be collateralized, but depend on the issuer's solvency and willingness to buy and sell securities to deliver fully to expectations.</li> <li>• This category should exclude ETIs, as defined below.</li> </ul>
<b>ETC</b>	<b>Exchange-Traded Commodity</b>	<ul style="list-style-type: none"> <li>• A variety of fully-collateralized legal structures that are not ETNs but seek to deliver the unleveraged performance of a commodity or basket of commodities.</li> <li>• Some ETCs may hold physical commodities, while others invest in commodity futures or commodity-based total return swaps.</li> </ul>
<b>ETI</b>	<b>Exchange-Traded Instrument</b>	<ul style="list-style-type: none"> <li>• An ETI is any ETP that has embedded structural features designed to deliver performance that will not track the full unlevered positive return of the underlying index or exposure (that is, products that seek to provide a leveraged or inverse return, a return with caps on upside or downside performance or "knock-out" features).</li> </ul>

## EU market structure <sup>21</sup>

The last two decades have seen efforts to integrate and harmonise disparate national markets into a single EU market. The 2004 Markets in Financial Instruments Directive (MiFID I) increased competition in a range of financial services through the single market 'passport', removing a number of barriers to cross-border trading, and paving the way for electronic trading platforms to compete with the established stock exchanges. These changes, and new technology, allowed brokers to route orders across competing trading venues, platforms, and exchanges, to achieve best execution for investors. While this caused fragmentation, competition reduced transaction costs for end investors.

In parallel, MiFID I imposed new requirements to report trading activity to selected entities in an attempt to improve post-trade transparency. The success of this initiative was limited, and market participants had difficulties gaining an accurate picture of trading activity.<sup>22</sup> In the wake of the 2008-09 Global Financial Crisis, a review of MiFID I in 2010 culminated in MiFID II and MiFIR (effective from January 2018). MiFID II attempted to strengthen investor protection; shift trading onto regulated, transparent, centralised trading venues; improve transparency; and reduce the volume of bilateral (OTC) trading. As a result, new venue types – such as Systematic Internalisers or Periodic Auctions – have increased in popularity.

The attempt to shift trading onto centralized lit venues looks to improve market transparency. In EU equity markets, liquidity is spread across venues (Table 3 describes the most common types). End-investors benefit from the competition among such venues, however post-trade transparency of where trading occurs is still insufficient. Strengthened transparency in particular is critical for improving the decision-making ability of market participants, regulators and investors alike.

### Delivering a consolidated tape

A consolidated tape of post-trade information discloses execution quantities and prices in a timely manner after trades have occurred. This happens near real-time with the exceptions of waivers for particularly large trades whose disclosure might damage liquidity supply. Real-time trade information strengthens price discovery and optimal venue choice, in line with best execution requirements. It promotes investor confidence in quoted prices and execution quality across electronic execution venues.

In the US market, SIPs perform this role, providing a high level of post-trade transparency around trading activity across venues – lit and dark alike. SIPs are integral to the functioning and efficiency of the US market.<sup>23</sup> In Europe, a consolidated tape of trades could be equally transformative, increasing transparency, strengthening best execution, and improving competitiveness.

**Figure 5: EU equity market structure priorities and principles**

	Innovation & Competition vs Complexity	Equal Access to Market Data	Disclosure and Investor Education	Price Formation & Market Resiliency	Applicability of Rulesets to ETFs
Deliver a European Consolidated Tape for trades and quotes		✓		✓	✓
Introduce an official European Best Bid and Offer		✓		✓	✓
Allow Midpoint Executions in any size and venue	✓			✓	✓
Clarify the Scope of the Share Trading Obligation	✓			✓	
Focus Future Regulatory Debate more on end investor benefits	✓		✓	✓	✓
Adopt Minimum Standards for Market Resiliency Mechanisms			✓	✓	✓

Under MiFID I, market participants were required to submit information on their trading activity to a Regulated Market, Multilateral Trading Facility, a third-party reporting entity, or to their own website. In practice, double counting and data quality issues led to widespread confusion. Estimates of dark pool activity ranged from 16% to 40% of trading volume.<sup>24</sup> More recently, MiFID II required all firms to publish trade reports on equities and ‘equity-like instruments’ (such as ETFs) through Approved Publication Arrangements (APAs), regulated by national authorities. MiFID II requires this information to be made available at reasonable cost, aiming to “set the conditions” for the emergence of consolidated tape providers, who would aggregate the data into a clean consolidated tape.

Despite its aspirations, MiFID II has not yet brought about a consolidated tape of real-time trades in Europe. This is mainly because it is currently uneconomical for a commercial organization to undertake the required data processing and cleaning. We believe that a single mandated consolidated tape is the best solution for Europe - **ESMA is well placed to take the lead in providing a pan-European consolidated tape solution.** At the upcoming 2020 review of MiFID II, policymakers should consider whether the current requirements are achieving their aim, and begin the process of mandating a solution if not. The target should be to establish a single authoritative source of trading data.

### European Best Bid and Offer

Beyond the strengthening of post-trade transparency, SIPs also provide pre-trade transparency for the US equity market. They collect real-time quote data from execution

venues and exchanges which is then disseminated as the consolidated National Best Bid and Offer (NBBO). Europe has no equivalent European Best Bid and Offer (EBBO). An official EBBO has the potential to increase pre-trade transparency, improve the public availability of pricing information to investors, and solve some regulatory market structure concerns.

At present, an EBBO is closer to being realised than a consolidated tape of post-trade information: data vendors provide aggregated pricing information from multiple execution venues. Execution algorithm providers compute their own EBBO to guide routing behaviour. The operators of Periodic Auctions compute and reference their EBBO for determining the midpoint of bid and ask prices. However, there is no official EBBO feed, meaning end-investors or smaller investment managers do not have access to pre-trade transparency data. Unequal access to pricing information hampers investor confidence in quoted prices and in obtaining best execution across venues.

While an EBBO presents the opportunity to disseminate official pricing information and further promote efficient electronic execution at low transaction costs, it is important to learn from the lessons observed in US equity markets. The implementation choices of the EBBO should consider the following aspects:

- **Competing feeds:** To avoid a situation where market participants need to buy both proprietary exchange data feeds and official SIP data we recommend mandating the quote feed broadly enough to include all data items and

**Table 3: Venue Types in European Equity Markets**

Venue Type	Description	Midpoint Execution	Examples
<b>Primary Exchange</b>	Main exchange of a country, before MiFID I a country's only exchange. Closing auction activity takes place on primary exchange. Considered lit due to pre-trade transparency	No	London Stock Exchange
<b>Pre-trade transparent MTF</b>	Execution venues that operate in a very similar way to the primary exchange based on visible limit order books; also considered lit	No	CSE Book CBOE, Turquoise
<b>Systematic Internaliser</b>	Execution venue operated by a liquidity provider for principal or “risk” trades; increased popularity after MiFID II banned Broker Crossing Networks; pre-trade transparency for smaller orders	Yes	Broker SIs (e.g. JPM), Electronic Liquidity Provider SIs (e.g. Jane Street)
<b>Periodic Auction</b>	New type of venue that runs multiple auction sessions to match buys and sells; reference to best bid and offer prices available (EBBO); lit properties due to transparent prices	Yes	CBOE, Sigma X
<b>Dark MTF</b>	Venue without pre-trade transparency in which buyers and sellers look to match orders, often in large size; midpoint execution mitigates market impact; considered dark	Yes	ITG Posit, Liquidnet
<b>Dark Large-in-Scale or Conditional Venue</b>	Venue or functionality to execute blocks under the Large-in-scale waiver when block liquidity becomes available	Yes	CBOE Large-in-scale, ITG Posit, Turquoise Plato

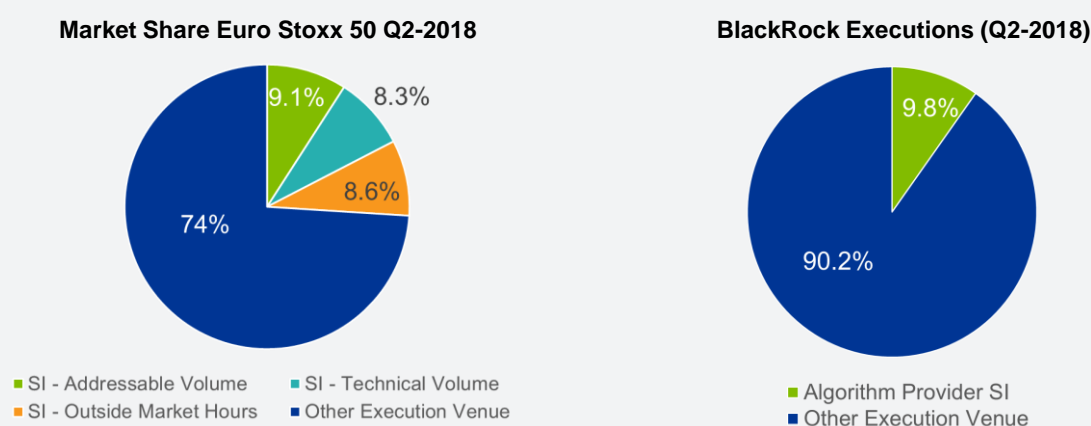
Source: BlackRock. Parent companies often operate different protocols which cover multiple types of venues. For example, ITG Posit is a dark MTF, has large-in-scale functionality and also operates a periodic auction protocol. CBOE operate lit and dark order books as well as a periodic auction. As a result, the classification of venue operators can be ambiguous and span multiple types of venues. Primary exchanges do not offer midpoint executions in their regular continuous trading protocols but can have additional midpoint crossing auctions or protocols.

## The need for a consolidated tape: Systematic Internaliser transparency

The current debate around Systematic Internalisers in Europe highlights the importance of a clean consolidated tape. Systematic Internalisers have grown in popularity and estimates of their market share vary between 2% and 30%. These are different interpretations of the same data – underlining the need for a single authoritative source to establish consensus. RTS 27 reports, supplemented with market data of daily traded volumes, suggest that Electronic Liquidity Provider (ELP) and Bank Systematic Internalisers together account for 26%

of the European Large Cap universe. The Systematic Internaliser market share composed 9.1% of addressable liquidity during continuous trading hours, 8.3% non-addressable 'technical' liquidity, and 8.6% non-addressable outside-hours liquidity when exchanges are shut.<sup>25</sup> It would be misleading to claim that Systematic Internaliser liquidity accounts for a third of Europe's liquidity when, instead, the accessible market share is 9.1%. A consolidated tape could objectively clarify that order routing to SIs is not as excessive as claimed.

**Figure 6: Market share of Systematic Internaliser Volumes**



Source: BlackRock

fields which are critical for order routing. This would strengthen the its credibility as a single authoritative source of data and helps eliminate conflicts of interest from exchanges providing competing products which market participants would be forced to purchase.

- **Latency:** Markets are neither fair nor effective when data is disclosed selectively or made available at different speeds. It is important to avoid creating a two-tiered market data ecosystem between proprietary and consolidated data feeds. For Europe, we recommend a set-up which encourages the launch of either competing or more geographically distributed consolidated tape providers to lessen any potential timing disparity between consolidated data and proprietary feeds – particularly as exchange data centres are heavily dispersed across Europe in terms of geography.

- **Best execution:** Best execution is a long-established concept in Europe, strengthened by MiFID II's enhanced monitoring requirements. To promote it further, we recommend a focus on the quality of quote data aggregation and efficient dissemination to market participants. This supports optimal order routing and the ability to evaluate the executions ex-post based on objective data.<sup>26</sup>
- **Contributors:** The EBBO could strengthen pre-trade pricing information and therefore price discovery. To level the playing field between all execution venues with pre-trade quoting, we recommend a holistic approach to EBBO contribution (such as the inclusion of Systematic Internaliser quotes not covered by Large-in-Scale waivers). This would mitigate any concerns that Systematic Internaliser activity is detrimental to price discovery, making a shift to exchanges redundant.

## Improving European ETF market structure

Equity market structure in Europe has undergone a huge shift towards electronic trading, resulting in efficiency benefits and lower trading costs. ETF market structure has undergone a similar shift, mostly trading on Request for Quote (RFQ) platforms with a low proportion of Central Limit Order Book (CLOB) execution. The differences between ETF and Equity electronic trading methodologies are partly explained by a lack of pre- and post-trade transparency for ETFs relative to Equity markets, and greater fragmentation, resulting in multiple trading identifiers. Historically, the lack of good quality centralized pricing and volume data for ETFs has slowed the development of equity-like execution utilising algorithms and CLOBs. The inclusion of ETFs as MiFID instruments and the improved post-trade transparency is a step in the right direction. **A consolidated tape with an EBBO and central clearing for RFQ and OTC trades will further increase transparency, reduce fragmentation and improve settlement efficiency for ETFs.**

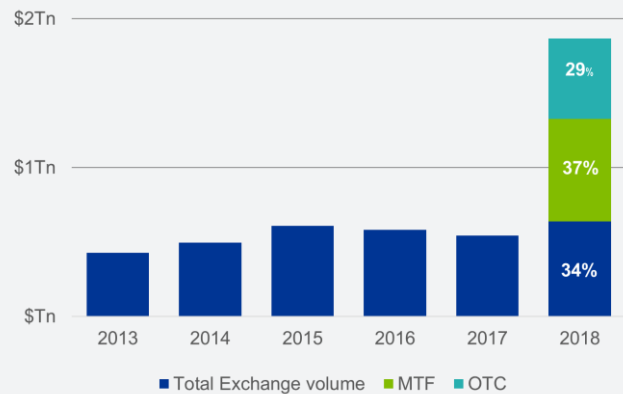
## Mid-price executions

European regulators increasingly focused on policy measures aimed at shifting trading activity onto 'lit' execution venues with high pre-trade transparency requirements. These include a change in Systematic Internaliser and Periodic Auction regulation, and an extension of the tick size regime. It is critical that these amendments do not interfere with an investor's ability to execute at midpoint, which is essential for implementing investment decisions cost efficiently and keeping European equity markets globally competitive.

Midpoint executions allow buyers and sellers to match their orders at the midpoint price, allowing both parties to make a saving relative to the respective best bid and ask prices on an exchange. They occur on block crossing venues, in Periodic Auctions, in the closing auction, or in Systematic Internalisers. Block crossing venues and auctions facilitate investor-to-investor transactions while Systematic Internalisers facilitate investor-to-broker (or to-ELP) risk trades. Investors benefit from the favourable midpoint price.

We support MiFID II's ban on Systematic Internalisers crossing client-to-client flow as riskless principal, and the aspiration to establish a level playing field across execution venues. However, to ensure a level playing field, Systematic Internalisers should be able to execute trades against their own capital at the midpoint, with full adherence to the tick size regime. This is particularly important for large-in-scale orders.

Figure 7: Trading volumes by venue type



Source: Bloomberg, BlackRock; 2018 volume data has been annualized. MTF and OTC volume are not available before 2018.

We also welcome regulatory efforts to improve the contributions of Periodic Auctions to the European equity landscape.<sup>26</sup> Periodic Auctions emerged after MiFID II implementation, and the question of whether their broker self-matching feature is replicating (banned) broker crossing is rightly being raised.<sup>28</sup> However, Periodic Auctions are an innovative midpoint execution venue with benefits for end investors.

The current debate on the tick size regime may have implications for midpoint execution. The Investment Firm Review (IFR) proposes to apply the tick size regime to Systematic Internaliser quotes of all sizes, price improvements, and execution prices. We support amendments to the tick size regime that enforce quoting in round ticks and prohibit insignificant tick increments; marginal improvements provide no meaningful benefit to end investors. However, the tick size regime should not interfere with investor's ability to execute at midpoint even when this is a half tick. This is an essential feature for matching buys with sells fairly, and is common practice in markets globally.

**As policymakers consider amendments and clarifications to the MiFID regime, any changes should allow midpoint executions to take place across all venues. We recommend clarifying that execution at EBBO midpoint is permitted when quotes adhere to the tick size regime.** This improves execution quality for end-investors and avoids unnecessary erosion of the competitiveness of European equity markets.



## Share Trading Obligation and Double Volume Cap

MiFID II places some direct restrictions where stocks can trade, notably under the ‘Share Trading Obligation’ (STO) and Double Volume Cap (DVC). While the objective of these measures is to shift increasing amounts of trading onto stock exchanges, they can result in ineffective or harmful outcomes for end-investors.

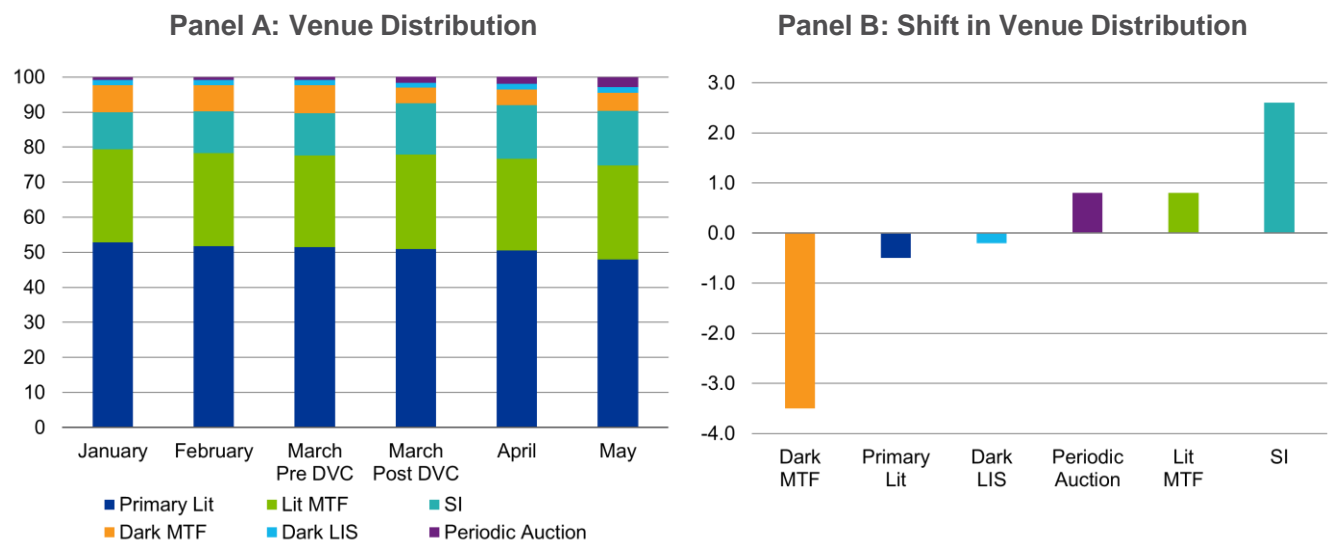
Under the STO MiFID investment firms are only allowed to execute shares which are tradable on European trading venues (TOTV) on regulated EU trading venues, on ‘third-country’ (non-EU) trading venues in countries deemed equivalent, or through a Systematic Internaliser. This has led to confusion around the treatment of shares with primary listings outside of the EEA, particularly where there are delays in equivalence decisions. Without clarification, investment firms trading non-EEA stocks with EEA listings (such as Apple) may be forced to execute differently for European clients than for US clients. This puts European investors at a disadvantage. For the majority of non-EEA stocks, there will be better trading outcomes if trades take place where the stock has its primary listing, where liquidity is typically concentrated. In these scenarios, application of the STO could impede execution quality. While Apple may be a straightforward case, there are other examples where it is less obvious whether European liquidity is non-systematic, ad hoc, irregular and infrequent (i.e. subject to the ‘infrequent exemption’). **We recommend that regulators clarify that STO should be limited only to stocks with significant liquidity in the EEA.** European end-investors otherwise

face a disadvantage relative to those in other countries. Brexit may exacerbate this challenge for European investors.<sup>29</sup>

The Double Volume Cap restricts the volume of a stock that can trade in venues without pre-trade transparency: dark trading is capped at 4% at the venue level, and 8% across all venues in the EU. Figure 8 provides some empirical evidence on how the DVC impacted the distribution of volumes across venues in mid-March 2018. We saw an immediate drop of Dark MTF liquidity by 3.5% of total volume share, lit markets remained largely unchanged, SI share rose 2.6%, and Periodic Auctions by 0.8%. The results are qualitatively similar for longer time periods, with a further rise of Periodic Auctions. This reflects the complex interactions in the equity eco-system; dark executions migrate to multiple execution venues best suited for the properties of each. Given this, we should not assume that lit trading is preferable to dark and that restricting dark trading will shift volume to lit alternatives.<sup>30</sup>

Venues with and without pre-trade transparency contribute to liquidity provision. **Regulators should take a less direct stance in trying to shift liquidity from dark to lit markets, and reframe the debate on the contributions to liquidity and benefit to the end-investor (and in turn the Capital Markets Union).** Excessive attempts to shift trading from dark to lit markets risks reducing market liquidity and increasing costs without improving price discovery. A consolidated tape and EBBO are more effective tools to strengthen transparency and price discovery.

**Figure 8: Liquidity Across Venues before and after DVC (% of Total Volume)**



Source: Goldman Sachs, Reuters, BlackRock<sup>31</sup>

## Market Resiliency mechanisms

MiFID II addressed the provision of market resilience controls across European trading venues, in an attempt to ensure resiliency in stressed markets. Importantly, however, it did not specify the mechanisms required.<sup>32</sup> The fragmented nature of the European trading ecosystem has led to a wide variety of approaches to volatility controls across markets and asset classes. **We urge the adoption of minimum and consistent standards across European markets**, in particular:

- **Automated controls should be a basic requirement for trading venues.** Currently, a number of markets rely on manual interventions, which are not suitable for market wide volatility events. On volatile days it is likely that trading in large numbers of securities will be paused or suspended while exchange controls attempt to find clearing prices. It is imperative that controls are automated and do not rely on manual intervention to ensure securities return to trading as quickly as possible, minimising disruption.
- **Opening auctions should have staggered standardised thresholds** (for example 5%, 10%, or 15%), based on the underlying volatility of the security, ensuring that methodologies are robust and disclosed. This would ensure that on particularly volatile days, securities are able to enter a live trading phase, rather than being suspended due to the operation of volatility controls, and avoids unnecessary trading halts impacting price formation and ability to execute trades. Currently, European market utilise a wide variety of volatility controls, and use different price thresholds (for instance some markets use a fixed disclosed threshold for pausing trades and other markets use variable thresholds based on the volatility of the security). Some securities trade on multiple exchanges across Europe, so diverging practises could lead to different price impacts during volatile periods, impacting confidence in the markets and liquidity provision. These controls protect investors when trading but also to determine opening and closing prices which are critical for benchmarking and valuation purposes.
- **Intra-day volatility auctions** (similar to LULD policies in the US) **should be an additional feature of all trading venues**, and standardised across venues. These would include the same features as the opening auction with

controls based on the underlying volatility of the security. The methodology should be disclosed and closely aligned with opening and closing auctions.

- **Trade cancellation policies** (similar to CEE policies in the US) **should be aligned with any volatility auction process and should not occur within volatility thresholds.** The use of trade cancellation policies varies across Europe, with some exchanges utilising these policies as their primary volatility control. We believe that trade cancellation policies should be used sparingly, with volatility auctions used as a primary resiliency mechanism. This will ensure that liquidity provision and arbitrage activity is not impacted by trade cancellations. Most liquidity provision is hedged, and cancelling one leg of a transaction can leave liquidity providers exposed. The methodology for trade cancellations should be transparent to all market participants, and should use clearly defined thresholds for assessing erroneous trades.
- **Resumption of trading after a pause or halt requires as much consideration and calibration as those that trigger them.** Securities should resume trading under conditions where buy-sell imbalances are relieved and market prices represent equilibrium levels.

The US experience with market resiliency mechanisms highlights the importance of making sure all mechanisms complement rather than interfere with one another. We urge Europe's policymakers to be mindful of this in any upcoming review of the MiFID regime.

## Conclusion

Overall, we consider the regulatory frameworks governing equity market structure in both the US and EU to be of a high standard, and not in need of fundamental change. Recent reforms in both regions have generally supported the overall trend towards well connected, liquid, and lower cost markets, and have largely kept pace with rapid technological changes. The principles we have identified are intended to help regulators continue to ensure markets are orderly, resilient, and fair. Adhering to these principles and continuing to make technical adjustments as markets develop will benefit both end-investors and the companies seeking their capital. We look forward to working with regulators on these issues going forward and will continue to bring the end-investor perspective to the discussion.

1. Securities Exchange Act §11A(a)(1)(C) OR 15 USC § 78k-1(a)(1)(C)
2. Brett Redfearn, Director, Division of Trading and Markets, *Statement on Enhancing Order Handling Disclosures*, Nov. 2, 2018 (see <https://www.sec.gov/news/public-statement/redfearn-statement-enhancing-order-handling-disclosures>)
3. US Securities and Exchange Commission (2005) *17 CFR Parts 200, 201, et al. Regulation NMS; Final Rule*, available at: <https://www.sec.gov/rules/final/34-51808fr.pdf>
4. Securities Exchange Act § 11A(a)(3)(B) OR 15 USC § 78k-1(a)(3)(B)
5. Report of the Subcommittee on Securities of the Senate Committee on Banking, Housing and Urban Affairs, *Securities Industry Study*, S. Doc. No. 93-13, at 149 (1973)
6. Automated quotes on exchanges are protected by the Order Protection Rule – Rule 611 of Reg NMS.
7. A maker-taker model is one where orders that execute against (take) a resting bid or offer receive a rebate, while non-marketable orders which rest (make) in the order book are charged an access fee. In the traditional maker-taker model, orders which provide liquidity (make) receive a rebate, while orders which remove liquidity (take) pay an access fee.
8. Indeed there is evidence that brokers route orders in a way that maximises payments and is unlikely to be in investors' best interests. See Battalio *et al.* (2015) *Can Brokers Have it All? On the Relation between Make-Take Fee and Limit Order Execution Quality*, available at: <https://www.sec.gov/spotlight/emsac/can-brokers-have-it-all.pdf>
9. SEC (2018) *Press release: SEC Adopts Transaction Fee Pilot for NMS Stocks*, available at: <https://www.sec.gov/news/press-release/2018-298>
10. H.R. Rep. No. 94-229, 94<sup>th</sup> Cong., 1<sup>st</sup> Sess. 93 (1975).
11. Concept Release: Regulation of Market Information Fees and Revenues, SEC Release No. 34-42208, 64 FR 70613 (December 17, 1999)
12. Latency is the time interval or delay experienced when transmitting or processing data. In a market data context, market participants are concerned with the difference between the time when a transaction takes place and the time when information is received about it.
13. In 2016, the latency of the NASDAQ SIP was reduced by 95% to less than 20 microseconds as a result of software and hardware upgrades and a switch to binary protocols. See <https://globenewswire.com/news-release/2016/10/24/882097/0/en/Securities-Information-Processor-SIP-Migrates-to-the-Nasdaq-Financial-Framework-and-INET-Technology.html>
14. For instance, a SIP subscriber in a Secaucus data center observing a NYSE execution in a NASDAQ listed stock, must wait for the data regarding the transaction to travel from Mahwah (NYSE) to Carteret (NASDAQ SIP) to Secaucus (subscriber). A market participant using a proprietary NYSE feed would only be subject to the more direct transmission time from Mahwah to Secaucus.
15. SEC (2016) *Investor Bulletin: Measures to Address Market Volatility*, available at: <https://www.sec.gov/oiea/investor-alerts-bulletins/investor-alerts-circuitbreakersbulletinhtm.html>
16. See SEC *Investor Bulletin* at 15.
17. See BlackRock (2015) *ViewPoint: US Equity Market Structure: Lessons From August 24*, available at: <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-us-equity-market-structure-october-2015.pdf>
18. Joint Advisory Committee on Emerging Regulatory Issues (2011) *Recommendations regarding regulatory responses to the market events of May 6, 2010*, available at: <https://www.sec.gov/spotlight/sec-cftcjointcommittee/021811-report.pdf>
19. BlackRock, Markt
20. Greenwich Associates, *Global Trends in Institutional ETF Adoption: Drivers for Growth Through 2020*
21. The European market structure recommendations are being provided for participants bound by MiFID II rules with the assumption of no immediate Brexit impact. There is a high degree of uncertainty how Brexit will affect UK participants, EEA participants and the eco-system of European equity markets in the medium to long term.
22. Double-reporting of trading activity in particular remained an obstacle to gaining an accurate picture of aggregate liquidity. For orders not executed on a RM or MTF, investors were required to report their equity trades to an RM, MTF, another third-party reporting entity, or their own website. Although the intention of this initiative was to improve transparency around how much trading was taking place in dark pools, the effect was the opposite: the reporting led to widespread confusion – some estimates of dark pool activity ranged from 16% to 40% of trading. For more information see Aite (2013) *Market Fragmentation and Its Impact: a Historical Analysis of Market Structure Evolution in the United States, Europe, Australia, and Canada*, available at: [http://www.cvm.gov.br/export/sites/cvm/audiencias\\_publicas/ap\\_sdm/anexos/2013/sdm0513-manifestacaoBMFBovespaAnexoll\\_09-08-2013.pdf](http://www.cvm.gov.br/export/sites/cvm/audiencias_publicas/ap_sdm/anexos/2013/sdm0513-manifestacaoBMFBovespaAnexoll_09-08-2013.pdf)
23. See previous US section.
24. See Aite (2013) at 22.
25. 'Technical liquidity' could be, for example, the CFD give-up process. For further analysis, see BAML (2018): EMEA Equities Market Structure Update, 07 December 2018. The universe is based on the Euro Stoxx 50 in the second quarter of 2018. Separate BlackRock analysis of BlackRock algorithmic execution data for the same time period shows that 9.8% of child level executions were filled in the algorithm provider's own SI rather than executed elsewhere in the market. This finding is similar to BofAML's results.
26. Further best execution measures such as the US market's Order Protection rule seem unnecessary in Europe.
27. ESMA, Call for evidence: Periodic Auctions for equity instruments, ESMA70-156-785, 09 November 2018.
28. A recent study observes that up to 20% of activity could be interpreted as 'broker crossing'; see Kepler Cheuvreux: *The benefits of Periodic Auctions Beyond Dark Trading Caps*, Dec 2018. Kepler Cheuvreux do not operate a Periodic Auction.
29. Under Brexit we may be confronted with similar questions for shares listed in the UK and EEA in the future which would equally benefit from clarification that trades in the larger liquidity pool are still permissible. So far, there has been no indication that EU regulation will recognize UK venues, including Systematic Internalisers, as equivalent. Without such equivalence, trades for European investors on UK venues could be in breach of a European STO under Brexit.
30. There is no empirical evidence that Dark pool activity had been detrimental to investors or liquidity. Monica Petrescu, Michael Wedow (2017): *Dark pools in European equity markets: emergence, competition and implications*, European Central Bank Occasional Paper Series, No 193, July 2017.
31. The graph does not contain auction flow. SI data captures flow report on the BATS/Chi-X OTC Reporting Tape excluding technical trades. The data set includes BATS Europe, Chi-X and Turquoise as the measure of lit MTF volume. The data covers trades from 01 January to 31 May 2018 (Panel A), and 01 March to 31 March 2018 (Panel B). March data is split into pre/post DVC effective date 12 March.
32. Article 48(5) of Directive 2014/65/EU in financial instruments (MiFID II), available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0065&from=EN> specifies that "Member States shall require a regulated market to be able to temporarily halt or constrain trading if there is a significant price movement in a financial instrument on that market or a related market during a short period and, in exceptional cases, to be able to cancel, vary or correct any transaction".

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