



End-user Perspectives on Computerised Trading

In association with



The Future of Computer Trading in Financial Markets

This paper has been commissioned as part of the UK Government's Foresight Project on The Future of Computer Trading in Financial Markets. The views expressed are not those of the UK Government and do not represent its policies.

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Executive summary

Context

To support the UK Government Office for Science's study into The Future of Computer Trading, Oliver Wyman was commissioned to gather the views of buy-side participants on the usage, impact, and policy options for computer generated trading, in particular algorithmic and high frequency trading. This report is a summary of the findings from the survey and interviews undertaken.

The study aims to capture the perspectives of end-users of capital markets, focusing on traditional investors defined as Asset Managers, Pension Funds and Insurers. To cover the gamut of end users, survey participants range in size and geography from large global institutions to national entities. Alternative investors, in particular long-short hedge funds, are long-term holders of significant quantities of securities; therefore their perspectives are included on key issues. In terms of products, the study covers all capital markets but current market practices draw focus on cash equities and listed derivatives.

Key findings

Investors are concerned about the lack of clarity in the public debate around the types and uses of computerised trading, including in the recent MiFID II text. Algorithmic trading (AT) now has widespread use amongst all types of investor due to its benefits in terms of workflow and liquidity optimisation and cost efficiency. Most traditional investors use algorithms provided by their brokers, though increasingly some have developed or are developing in-house solutions.

High frequency trading (HFT) techniques are largely only used by alternative investors employing quantitative programs to arbitrage market movements. That said, a small number of other investors were aware that the algorithms their brokers use to execute their trades may resemble some HFT techniques; this is seen to be rare.

The wide use of AT is also seen as a necessary reaction to the fragmentation of market venues brought about by MiFID I and other market and regulatory developments, a step largely seen as positive by investors. While all investors agree that direct trading costs in terms of commissions and spreads have decreased significantly as a result, there are mixed views about the trend of the total cost of trading, with some investors believing that gains have been offset by increased market impact costs or increased operational costs for personnel to monitor and manage their order flow.

Traditional investors are increasing their use of market auctions and dark pools in an attempt to optimise overall execution cost. While pre-trade price transparency is seen to have deteriorated since the introduction of MiFID, traditional investors caution that an increase in the disclosure requirements for dark pools will serve to benefit HFT strategies at their own expense. However, without any change, there is growing concern that price discovery is migrating away from the lit venues, to the overall detriment of market quality and stability. Balancing these issues is seen as a complex task but key to market quality going forward.

Post-trade transparency is viewed as a less complex and more immediate issue; traditional investors unanimously support the implementation of a consolidated tape in Europe and voice

frustration that this has not happened to date. Achieving this will provide some comfort that the price discovery risk is contained.

Liquidity has become more fragmented for traditional investors but services offered by brokers have helped to mitigate this impact. Traditional investors feel the volatility of liquidity has increased due to AT/HFT, with market depth diminishing in stressed phases, spurring additional price volatility. By contrast, alternative investors see no meaningful impact on liquidity for their trade requirements, with most stating that liquidity has been enhanced by AT/HFT.

The recent increase in volatility is noted by all, but most do not consider AT/HFT to be the instigator of this. Consensus is that volatility is primarily caused by macro-economic factors, but that AT/HFT activity may exacerbate volatility once markets enter a stressed phase.

There is broad agreement among traditional investors that abusive trading practices need to be tackled, with most concerns centring on the high number of computer generated orders being used to manipulate 'real' liquidity. However, opinions vary on how best to address abusive trading. While far from uniform, there is enough support for micro-structural solutions such as minimum resting times, trade-to-order ratios and cancellation charges to warrant policy makers investigating these solutions in detail. However, all investors make clear that the second-order impacts of any measures need to be fully assessed prior to any action being taken. Traditional investors are particularly concerned on the inequality of latency; co-location services especially are viewed by some as a breach of equal market access. Investors also question the broader fee and incentive structures in place at execution venues. Alternative investors typically oppose the concept of regulatory action, citing a desire to avoid over-regulation and highlighting the potential negative impacts of ill-considered measures.

The prospect of computerised trading activity spreading to other markets such as OTC derivatives is met with cautious optimism. Many welcome the potential benefits of efficiency gains and reductions in transaction costs. However, traditional investors remain concerned that this could provide additional opportunities for malevolent HFT strategies and wish to see this addressed upfront.

The investors surveyed express significant discomfort with the regulatory process itself. There is a widespread sense that the buy-side does not have an adequate response mechanism and in the absence of this, the debate around AT/HFT seems to be largely conducted between policy makers and regulators, the broker-dealer community and the execution venues. In addition to this, several investors express concern that the regulatory process seems slow to deal with issues they see as key, such as post-trade transparency and abuse surveillance, while pushing for significant change very rapidly on a range of more complex issues through MiFID II and Dodd-Frank.

Key findings

Introduction

Purpose of this document

Her Majesty's Treasury (HMT) is sponsoring a project¹ to explore how computer generated trading in financial markets might evolve in the next ten years or more and the resulting effects on market participants, financial stability, market integrity and competition. As part of this, HMT invited buy-side market participants to engage in this important debate.

Oliver Wyman was commissioned to gather the views of buy-side participants on the usage, impact and policy options for computer generated trading, in particular algorithmic and high frequency trading. This report summarises the findings of the survey and interviews conducted by Oliver Wyman.

Survey approach and format

We engaged the end-users in a dialogue of around ~30 questions which were provided to participants a priori. While some participants provided written answers to the survey, the majority of the views were taken through interview discussions. We felt this approach would generate significantly more valuable insights than an exhaustive tick-box question approach. The survey is qualitative and not meant to generate statistical charts, though we have included one or two.

Percentages are used throughout this report to quantify the consensus amongst respondents. Not all survey participants answered all questions, thus the total number of responses received varies by question. Percentages given refer to the number of respondents who agree with a statement relative to the number of responses received for that particular question.

In addition, throughout the document we have taken the liberty of using descriptive terms to signify level of consensus among respondents on particular points. For the purpose of clarity, our own rule of thumb in applying these descriptions has been as follows.

'Unanimous' means 95%-100% of respondents, 'a large majority / most / broad consensus' corresponds to 67%-95% of survey participants, 'a majority / many' is above 50%. 'A significant minority / some' refers to 25%-50% of respondents agreeing with a statement and 'limited support / few' to percentages below 25%.

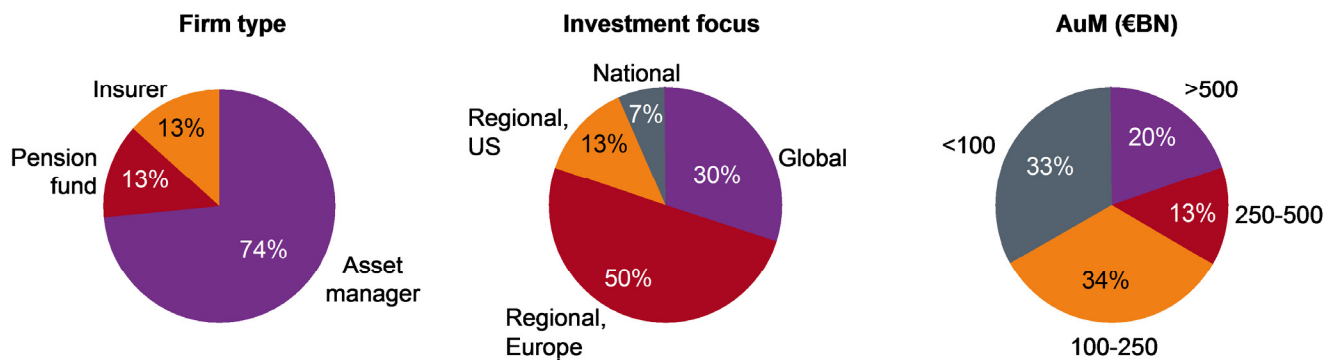
Definition and profile of survey participants

The mandate for the survey was to capture the perspectives of securities investors. To this end two segments of investors were involved:

¹ Foresight project *The Future of Computer Trading in Financial Market*. For details, please visit <http://www.bis.gov.uk/foresight/our-work/projects/current-projects/computer-trading>

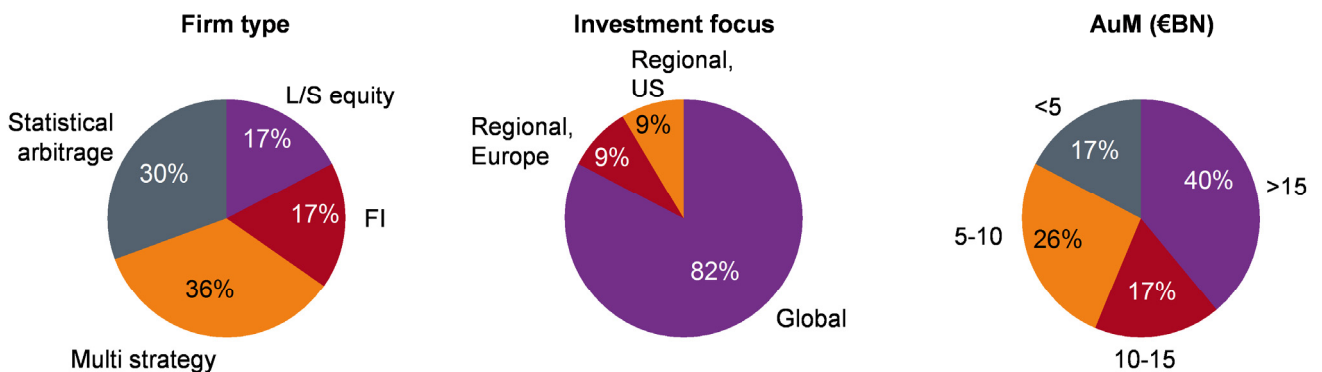
Traditional investors: We have pragmatically used the terminology ‘traditional investors’ for primarily unleveraged Asset Managers, Insurance Companies and Pension Funds. While there are weaknesses to this nomenclature, we felt it significantly better than other options such as long-only, real money or unleveraged (and their corollaries by extension). This was the main group surveyed: Of the 53 participants, 30 were traditional investors. To capture the gamut of end users, survey participants range in size and geography from large global institutions to national entities. Figure 1 shows the profile of the traditional investor group.

Figure 1: Profile of Traditional Investor participants (30 participants)



Alternative investors: The term ‘alternative investors’ is used for all hedge fund or primarily leveraged strategies. The focus in the alternatives group was on trade-able securities - we did not include private equity or real estate funds or other alternative investors (see Figure 2).

Figure 2: Profile of Alternative Investor participants (23 participants)



For clarity, the views of traditional investors and alternative investors are segregated throughout the report.

Definition of trading activities

Computerised trading is a broad term encompassing a range of activities but specifically includes Algorithmic Trading (AT) and High Frequency Trading (HFT). The definitions of Algorithmic Trading and High Frequency Trading are debated and interpretations vary. This report focuses on the impacts of AT and HFT, as per the definitions prescribed by the European Commission:

- Algorithmic trading (AT) is defined as “the use of computer programmes to enter trading orders where the computer algorithm decides on aspects of execution of the order such as the timing, quantity and price of the order”²
- High Frequency Trading (HFT) is defined as a type of AT “that uses sophisticated technology to try to interpret signals from the market and, in response, executes high volume, automated trading strategies, usually either quasi market-making or arbitraging, within very short time horizons. It usually involves execution of trades as principal (rather than for a client) and involves positions being closed out at the end of the day”²

Note that it is widely accepted that HFT is a subset of AT.

Other trading related activities referred to in this document include

- Electronic Execution - defined to be the use of an electronic interface to facilitate any activity across the trade cycle, from price discovery to order transmission. Note that it is widely accepted that AT and HFT are subsets of electronic trading
- Direct Market Access (DMA) – a service offered by brokers, providing investors with direct electronic access to exchanges and trading venues; this may also include the provision of technology infrastructure

Sub-segmentation of alternative investors into ‘core strategic users’ and ‘non-strategic users’

Algorithms are used in two broad ways by different alternative investors. Some investors use algorithms to execute trading decisions already taken. In other cases investors are using algorithms to generate orders and in some cases trades according to a pre-determined trading strategy. These strategies, for example, aim to profit from movements in market prices or higher order Greeks, to exploit arbitrage opportunities between different markets, or to exploit latency advantages.

In our sample, ~50% of alternative funds interviewed engage in AT/HFT to generate orders and will be referred to as “core strategic users” of AT/HFT. The remaining half of funds uses algorithms to execute trading decisions and will be referred to as “non-strategic users” of AT/HFT. We purposefully aimed for this mix of views in the survey although we have been careful to separate the views of alternative from traditional investors.

Definition of execution venues

For the purpose of this report, execution venues are primarily differentiated by the presence (“lit”) or the absence (“dark”) of pre-trade transparency.

The types of execution venue span regulated exchanges and alternative trading facilities (ATFs) – which include multi-lateral trading facilities (MTFs) and broker-pools. Note, the execution venue type and presence of pre-trade transparency are not mutually exclusive characteristics.







² European Commission 2010

Definition of products

While the survey is not particularly aimed on any specific product, the interviews focused largely on investors' use of the cash equity and listed derivative markets, given these are the markets in which computerised trading is most prevalent (see Table 1).

One section of the survey discusses the likely future application of AT/HFT to OTC derivatives markets with the advent of regulated electronic trading in these markets.

Table 1: Use of AT/HFT by asset class

Asset Class	Product	Detail	Current level of AT/HFT employment
Equity	Cash equity	<ul style="list-style-type: none"> Secondary trading of listed equities Includes secondary trading of ETFs AT/HFT prominent across all major global markets Limited penetration in emerging markets to date 	
	Equity OTC derivatives	<ul style="list-style-type: none"> Includes synthetics, OTC swaps, other delta-1 	
Listed derivatives	Listed F&O	<ul style="list-style-type: none"> All listed futures and options across all underlying asset classes (IRS, commodities, equity) Includes listed warrants, certificates Increasing levels of AT/HFT activity limited to sophisticated players 	
	Fixed Income	Bonds (cash)	<ul style="list-style-type: none"> All sovereign and agency bonds Corporate bonds
	FI OTC derivatives	<ul style="list-style-type: none"> Interest rate swaps (IRS) Credit-default swaps (CDS) Includes cross-currency swaps, structured rates and credit 	
	FX	<ul style="list-style-type: none"> Includes spots, forwards, FX swaps and options Some AT/HFT activity but limited to spot 	
Commodities	Commodity OTC derivatives	<ul style="list-style-type: none"> All non-listed commodity derivatives 	

 Primary class of AT employment
  High level employed
  Limited/none employed

Who is trading what and where?

Algorithmic Trading (AT) has become a widespread activity amongst all types of traditional investors. A distinction can be drawn between those institutions who use AT as a source for trades and those who use it purely for the efficient execution of trading decisions (see Table 2). A handful of survey participants highlighted that whilst their strategy was not focused on the use of HFT, they were aware that their brokers may be deploying HFT-like techniques, at specific points in time, to execute their orders.

By contrast about half of the alternative investors we surveyed used AT techniques to generate orders and trades as a fundamental part of their strategies, for example statistical-arbitrage, quantitative or discretionary quantitative funds; in our report we have referred to these as 'strategic users' of AT/HFT. The other ~50% of alternative funds stated that they do not have trading strategies dependent on the use of either AT or HFT. These investors were largely long-short equity funds, and in a number of cases event-driven funds. They typically use AT/HFT in similar ways to traditional investors, i.e. to most efficiently execute trading decisions already made. This group within the alternatives has been referred to as 'non-strategic' users of AT/HFT.

In fact within the strategic users group, only a couple of the alternative investor respondents described themselves as active users of HFT specifically as part of their trading strategies.

Table 2: Purpose and types of computerised trading

	Execution of trading decisions	Source for trade orders (e.g. Stat-driven arbitrage)
Algorithmic Trading (AT)	<ul style="list-style-type: none"> Used by 95% asset managers, 100% insurers and 50% pension funds surveyed Of the traditional investors who specified the asset classes, 96% use AT in cash equities, 25% in FX and 17% in listed derivatives Used by 100% alternative investors surveyed 	<ul style="list-style-type: none"> No traditional investors surveyed use AT in this way 48% of alternative investors surveyed have at least one statistical-driven strategy (use of algorithms to source trade orders)
High Frequency Trading (HFT)	<ul style="list-style-type: none"> A minority (fewer than 5%) of traditional investors surveyed aware of potential indirect dependence on HFT through brokers Limited disclosure from alternative investors surveyed on HFT strategies 	<ul style="list-style-type: none"> No traditional investors surveyed use HFT in this way A minority (fewer than 5%) of alternative investors surveyed described themselves as engaged in HFT as an order generation strategy

Use by product and share

Most market participants now view the use of AT tools for execution in cash equity markets as a standard market practice which is particularly important for block trades. More than 80% of traditional investor respondents engage in some form of AT, primarily for execution-only purposes. Some investors have begun to extend their use of AT to listed derivatives and FX.

The AT share of trade volume for traditional investors varies greatly, ranging from 3% (light users typically engaging via brokers only) to over 90% (heavy users who develop in-house algorithms in addition to broker services). In our sample, there appears to be very limited

correlation between the size of the institution (as measured by Assets under Management (AuM)) and the AT share of trade volume.

The use of Direct Market Access (DMA) by traditional investors is limited. Many are deterred by the increased burden on them to ensure efficient execution via DMA (i.e. minimise adverse price movements) and prefer to use the more holistic AT solutions on offer. The use of DMA increases the in-house human resources requirement for investors. The preference for AT over DMA has strengthened as the additional cost of AT solutions over DMA has reduced over time.

Alternative investors' use by product and share

All alternative investors interviewed use DMA and some also use AT execution tools. Amongst core strategic users, DMA/AT is responsible for an average of 80%-85% of trade volume. Non-strategic users execute 40%-60% of orders by DMA/AT. The proportion of total trades executed by DMA /AT is even higher than the proportion of volume, as almost all small trades tend to be executed in this way.

Most DMA/AT volume is in US and European equities, with smaller amounts in FX, listed derivatives, and other products.

Means of AT access

Over 85% of traditional investor respondents are dependent on their brokers for AT services. However, there is a divergence in the level of customisation and sophistication of AT tools being used by investors and offered by brokers.

- Large investors (by AuM) are generally satisfied with their brokers' services, with many indicating that they are provided with cutting-edge technology along with the ability to tailor AT to suit their needs
- Small asset managers (by AuM) raise some concerns over the transparency of their brokers' activities. In particular they would like greater visibility and control on where their trades are executed

Traditional investors are increasingly dependent on brokers to ensure efficient execution and this is seen to strengthen the position of brokers in the market.

Approximately ~15% of traditional respondents have begun developing in-house algorithms and roughly another ~15% of traditional investors have purchased third party vendor solutions over which they can exert greater control. These range from traditional passive Volume Weighted Average Price algorithms through to defensive 'anti-gaming' algorithms that aim to mitigate the effect of predatory HFT strategies.

Means of AT/DMA access for alternative investors

Most alternative investors interviewed access the market directly via DMA products offered by their prime brokers. A subset of funds has invested in the development of proprietary electronic execution infrastructure and connectivity. Various funds identify the use of dealer-offered electronic execution products (DMA/AT) as a complicating factor for regulators seeking to monitor HFT. Most dealer-offered DMA portals treat all orders equally, regardless of whether

the orders are coming from an established HFT firm or a long-only fund. Thus trades routed through these DMA “pipes” cannot be distinguished.

Reasons for using AT

AT is now seen by most traditional investors to be integral to achieving efficient trade execution in the world’s major cash equity markets. There is agreement across the investor universe on the advantages of AT (see Table 3).

The most common advantage cited by over half of traditional investor respondents is work flow efficiency and optimisation. Other key factors mentioned by a number of respondents are control of trading, anonymity, fragmentation mitigation and lower costs.

Table 3: Execution advantages of Algorithmic Trading

	Detail	Level of support
Fees	<ul style="list-style-type: none"> Lower commission rates vs. traditional voice brokerage 	
Anonymity	<ul style="list-style-type: none"> Reduces information leakage by use of multiple execution venues and splitting of orders Limits adverse price movements during execution 	
Efficiency	<ul style="list-style-type: none"> Automates workflow and reduces human effort required for trade allocation and execution Automates search for liquidity across multiple venues 	

Majority support
 Significant minority support

Alternative investors’ reasons for using DMA/AT

Alternative investors’ motivations for using DMA/AT are similar to traditional investors and include pricing, anonymity and efficiency. Funds also mention the ease with which large orders can be executed. For fewer than 10% of latency dependent funds, DMA/AT execution is a necessity given its speed advantage over non-DMA/AT execution. The majority of funds, which are not dependent on latency, see execution via DMA/AT as one of several options. These funds select the execution method (DMA, AT or voice) on a trade-by-trade basis.

Amongst core strategic users, 90% employ DMA/AT for virtually all small trades. Several funds believe that DMA/AT is generally more efficient than execution by voice but that large orders can still be finessed by humans in a manner that algorithms cannot mimic.

The use of alternative trading facilities (ATFs)

Over two-thirds of the traditional investors surveyed actively use alternative trading facilities (ATFs) for trade execution, either directly through their own smart order routing systems or indirectly via brokers. Note that both lit and dark ATFs are present in the market. A few

investors point out that this use of ATFs is not directly due to HFT, but rather a consequence of market fragmentation and the need to optimally source liquidity.

Dark pools are used by 65% of traditional investors surveyed, particularly when executing larger orders or trading less liquid securities. Many investors say that trading in dark pools helps to minimise market impact and price movements against them. Investors are increasingly concerned that their activity on lit venues provides HFT strategies with key signalling information, enabling them to profit from the trade at the cost of the traditional investor.

One global asset manager points out that predatory HFT strategies are not limited to the primary exchanges, resulting in the need to use AT execution tools to avoid HFT detection across all venues.

Dark pools are typically accessed indirectly via brokers (e.g. through the use of liquidity-seeking algorithms). A subset of respondents actively select the execution venues their brokers access – primarily with the motivation of avoiding the ATFs they perceive to be highly exposed to predatory HFT strategies. Many traditional investors are concerned that lit venues are becoming increasingly favourable to HFT strategies, to the detriment of traditional investors.

However, there are some different views. For example, two pension funds assert that while they do not use dark pools, they have limited visibility on the activity of their brokers and thus can provide little insight into any indirect engagement with AT/HFT.

Alternative investors' use of ATFs

All respondents are aware of dark pools, but none estimate that they execute more than 10% of their volume in such pools. Furthermore, 30% of funds express relative ambivalence on the issue, explaining that they are capable of executing all of their trades in lit venues, irrespective of whether they are part of an AT/HFT strategy or not.

A minority (20%) of funds express a meaningful desire for more transparency in dark pools but most are content with current dark pool transparency and are in favour of maintaining the status quo with regard to dark pools.

Migration to dark pools

Traditional investors highlight that before the formal creation of dark pools, equivalent activities took place at exchanges; with trades executed 'off-line' (or OTC) as brokers withheld parts of their order book from the exchange. The implementation of MiFID in Europe accelerated the creation of dark pools (and therefore increase the electronification of OTC trades), supported by demand from institutional investors looking to execute large whilst minimizing any adverse price impact.

The increase in HFT activity that followed MiFID is viewed by some traditional investors to be an unintended consequence of the new competitive environment that was created; with HFT strategies evolving to take advantage of the new market structure.

Of the traditional investors active in dark pools, many cite the presence of HFT in the market as a significant reason for migrating volume to dark venues. However, some believe the migration to be driven by an irrational paranoia of avoiding signalling risk, given that HFT strategies are also active in most dark pools. Many traditional investors make clear that HFT is not wholly responsible for dark pool use, as proven by the demand for equivalent activities prior to the advent of HFT. Other traditional investors view dark pools as a key source of liquidity, hence participation is required to ensure efficient execution of orders.

Traditional investors recognise there are different types of dark pools present in the market;

1. Institutional arenas (e.g. operated by Liquidnet, ITG) – primarily serving non-HFT institutional investors, enabled by selective membership criteria
2. Technology-driven venues (e.g. operated by Chi-X, BATS and broker hosted venues) – focused on execution performance (e.g. low latency, co-location provision)

Whilst traditional investors express a preference for using institutional arenas, many remain active in both types of venue, to avoid restricting sources of potential liquidity.

Most traditional investors active in dark pools are satisfied with the price discovery process. They believe that any potential issues of price divergence between lit and dark venues would be best addressed through improvements to post-trade reporting. Whilst many question the value that HFT strategies bring to dark venues, there is recognition that arbitrage strategies help ensure pricing efficiency between lit and dark venues.

Dark pools typically have greater venue fees than lit execution venues. However, the cost benefit of negating adverse price movements often outweighs the additional direct trading cost (given that explicit costs are typically only 5%-15% of overall execution costs, with the majority coming from market impact and timing). The specific advantages vary based on the functionality of each dark pool (e.g. mid-point match vs. a classic dark order book) but the key drawback in most is the uncertainty of execution. Hence it is the individual requirements of each investor that determine whether they use a dark pool.

Dark pools are used primarily for the execution of cash equities. The extension to listed derivatives has been restricted as contracts effectively remain proprietary material of the issuing venue through their monopoly on clearing. Some traditional investors believe there is potential for dark pools to extend to OTC derivatives, driven by underlying demand and the monopoly on clearing will not apply to these contracts.

Those traditional investors using dark venues strongly believe they play a key role in the equities market, with some suggesting that dark venues merely suffer from a perception problem by those who do not fully understand how they function and their purpose.

Alternative investors' perspectives on dark pools

Alternative investors as a whole acknowledge the presence and importance of dark pools as liquidity providers and as alternative trading venues, though they do not assess them as uniformly critical to a functional market. Of the alternative investors we met with, none of them had more than 10% of their total daily volume executed in dark pools. As a result, few of those we talked to perceived these unlit venues as vital to their business, which is not to say that the

advantages and motives for formation of dark pools is missed on the alternative investor community.

By in large, alternative investors tend to agree with traditional investors on many of the advantages associated with trading in dark pools. Anonymity is preserved when large trades are executed off exchange in these venues, and the price impact of these block trades can be diminished as well. Additionally, trade efficiency can be increased in the instance that a large order is executed in its entirety with a pre-arranged counterpart via a dark pool, as opposed to being executed in many bits and pieces over a longer period of time, as would likely need to be the case were the trade to take place on exchange. These are merely several of the advantageous characteristics of dark pools that alternative investors highlighted.

Assessment of the motives for the formation of dark pools is one place where alternative and traditional investors diverge slightly. Alternative investors did not indicate that they believe migrating volume to dark pools has been driven by the presence of AT/HFT in lit venues. Participants recognize that AT/HFT will eventually find their way into any trading venue where the kinds of pricing inefficiencies or latency factors that make these strategies profitable on exchange also exist. That is to say, it is understood by alternative investors that once liquidity in these unlit venues reaches a certain point, algorithms at play in lit venues will begin to also trade in these new unlit venues. The extent to which this can be curbed or hindered is correlated in some fashion with the extent to which liquidity in these venues can be restricted.

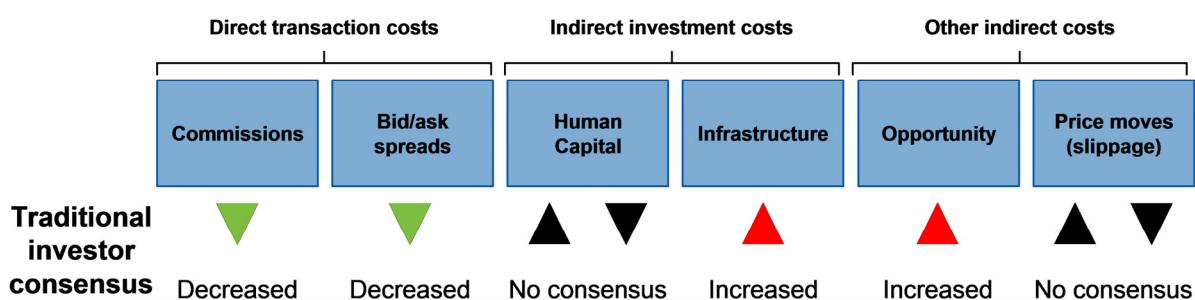
In sum, dark pools are not seen by alternative investors primarily as a haven from AT/HFT, since eventually one way or another these algorithmic approaches or strategies will find their way into any marketplace where profitable opportunities exist.

The quality of the trade

Cost of trading

The introduction of MiFID I led to the fragmentation of execution venues in the European market, altering the pricing models of exchanges, brokers, as well as the investment priorities of the buy-side. Similar trends occurred in the US. There are mixed opinions amongst traditional investors on the resulting impact on the cost of trading (see Figure 3).

Figure 3: Trading cost components for the buy-side



Of the traditional investors surveyed, approximately 30% have experienced an increase in the overall cost of trading in equity markets following the introduction of MiFID in Europe. However, only around 15% explicitly state that their costs have decreased while the rest of the group surveyed are unable to determine their overall cost impact.

In terms of direct transaction costs, the majority of respondents agree that commissions have decreased. Bid-ask spreads have also narrowed in many lit venues due to the increase in the number of market-makers and other liquidity providers. There remains some debate around the magnitude of the savings and how much of it is realised by the investor community. Some cite that the majority of direct cost gains are being reaped by brokers rather than being fully passed on to the investors themselves. Investors are aware that brokers will naturally seek to maximise returns on their infrastructure investments, on which investors are becoming increasingly dependent.

The narrowing of bid-ask spreads is seen as a by-product of execution venue fragmentation and AT/HFT activity. In particular, some respondents make clear the important role statistical-arbitrage strategies (a form of HFT) play in ensuring price convergence across venues. They also highlight their dependency on AT to navigate this liquidity fragmentation and realise the cost benefits.

The overall cost of trading, however, needs to take into account indirect investment costs (personnel, infrastructure) and opportunity costs. Many investors have experienced an increase in indirect costs. This increase relative to the direct cost savings determines whether the overall cost of trading has increased or decreased for investors.

Many traditional investors have observed an increase in their infrastructure spend. Though most rely on provisions from brokers, which are paid for directly via commissions on trades, some additional investment is still required. For example, more sophisticated investors are developing smart-order routing (SOR) systems in-house to enable greater control over where orders from broker algorithms get executed in the market.

Institutions that have complete dependence on their brokers for AT services have experienced limited change to their indirect costs. It is these same investors who feel they are not realising much of the direct cost benefits.

The impact of AT/HFT on the cost of human capital varies by institution. Some have benefitted from the increase in execution capacity offered by AT solutions through a reduction in the number of traders required to fulfil their mandates. Others have had to invest to ensure their in-house market practitioners are equipped with the appropriate skill-set to effectively trade in the market (i.e. they have a working understanding of algorithms in addition to markets knowledge).

Opinions vary on whether the lower direct transaction costs offset the additional investment requirements. Whilst the investor's trade volume performed via AT is a determining factor, there was not enough information from the survey to draw conclusions on this, primarily because most of the investors do not have hard analysis to allow them to assess this question.

In addition to direct and indirect costs, there are also opportunity costs associated with trading. Some traditional investors are experiencing an increase in the time it takes to fill their orders, especially in dark pools. Many hold HFT activity directly responsible for this. The increase in the time it takes to execute an order results in some traditional investors missing out on other trade opportunities and increasing their exposure to adverse price movements (slippage). Passive investment strategies (e.g. index tracking) are more exposed to price slippage as they are forced to rebalance their portfolios more frequently within a timeframe.

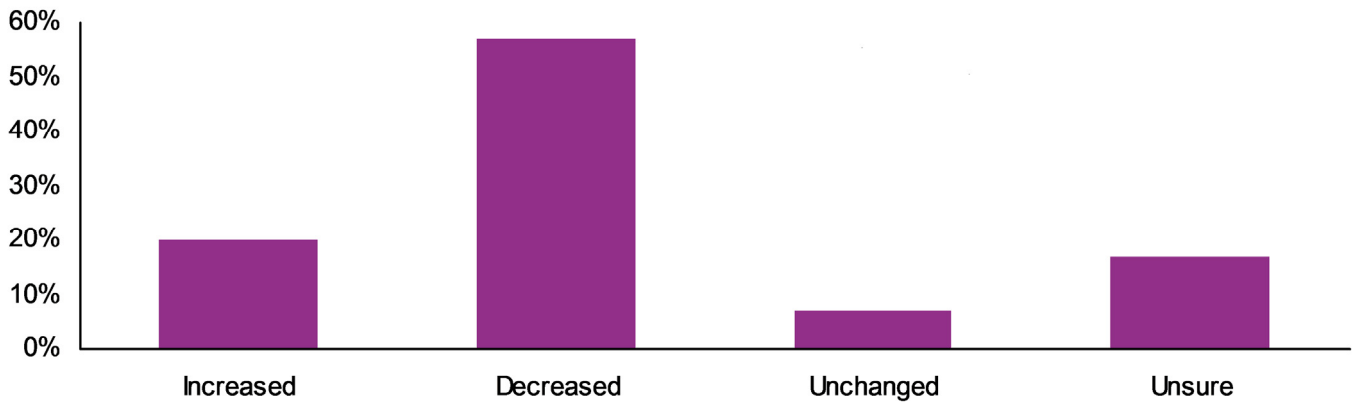
One large insurer recommends policy makers make use of external Transaction Cost Analysis (TCA) firms to analyse trends in the cost of trading.

Cost of trading according to alternative investors

Almost unanimously, alternative investor respondents explain that the advent of DMA/AT products has, in aggregate, reduced trading costs. More of the alternative funds are tracking metrics looking at overall trading costs in addition to spreads and commission levels. The extent to which the selection of execution tools is discretionary and widespread is cited by a number of funds as indicative of the cost-saving and efficiency-increasing properties of DMA/AT execution for alternative investors.

Price transparency

Over half of traditional investors surveyed believe that price transparency has decreased since the advent of AT/HFT (see Figure 4). However, a quarter of respondents is unsure of the impact or believes transparency to be unchanged. Most of the uncertainty centres around pre-trade price formation, whilst there is greater consensus on the post-trade issues.

Figure 4: With the advent of AT/HFT, overall price transparency has...**% traditional investor firms****Pre-trade transparency**

For the purpose of this report, pre-trade transparency broadly refers to the availability of reliable price and volume data ahead of submitting orders to the market. In addition, it refers to investors' ability to gauge market supply and demand at specific price points.

Despite the increase in available quotes, around 50% of traditional investor respondents feel that pre-trade transparency is deteriorating (vs. ~10% who believe it has improved as a result of market information and hence price changes being absorbed more quickly). Of these, almost all argue that price formation is the problem. At a first level, investors point to fragmentation across multiple venues and the noise created by HFT. A high level of cancellations is viewed as disruptive to the effective price formation on lit venues. Some investors go further in claiming that high cancellation levels indicate that a form of market manipulation is taking place. Additionally, there is a strong sentiment amongst traditional investors that pre-trade transparency generates "signalling risk" where HFT strategies are able to infer imminent trade activity from non-HFT investors. Together with a perception of smaller quote sizes, this has had the effect of driving traditional investors to explore dark pool liquidity before accessing lit pools, in some cases, as a liquidity pool of last resort. This has 2 key, contrasting implications:

1. Without a change, investors are increasingly concerned that true price formation is beginning to happen away from the lit pools, to the overall detriment of market quality; however,
2. Many question whether forcing greater pre-trade price transparency upon all forms of execution venues is desirable for an efficient market – there is the feeling that this will simply result in an economic transfer from traditional investors to HFT firms as the disadvantages of lit venues spread to the dark pools.

The traditional investors we spoke to recognise the value of a range of market microstructure solutions, given the wide range of types of trading, but ultimately feel that 'true' liquidity needs to be pooled. Balancing these requirements is the key challenge for policy makers and will carry significant implications for market infrastructure providers, trading firms and investors.

Post-trade transparency

There is unanimous support across the buy-side universe for a consolidated tape in Europe. The current setup is viewed to be grossly inadequate following the fragmentation of execution venues post MiFID. Some investors see the post-trade data problem as a major oversight of MiFID. Issues raised include inaccurate and fragmented post-trade data, delayed and duplicated prints and inadequate flags.

Those investors active in both the American and European markets note that the US have dealt with post-trade data consolidation effectively and that Europe could follow this as a blueprint. Few investors believe that the practical challenges of implementing the tape in Europe justify a delay in finding a solution.

Access to post-trade data is perceived by most players to be a fundamental requirement for market participants and some expect the data to be made available for free or at very low cost once a consolidated tape is implemented. Some investors have noted that reporting block trades needs to be addressed carefully to prevent a further withdrawal of brokers' risk capital from the market.

Price transparency as viewed by alternative investors

The majority of alternative investors interviewed express little concern with respect to price transparency. Most funds assert that market data made available by the execution venues on which the majority of AT/HFT takes place are sufficient. Any concerns voiced were accompanied by the opinion that those players who object to the transparency of various market venues should simply avoid them.

Disclosure rules in dark pools

Opinions on the disclosure requirements for dark pools are mixed. Some respondents believe more disclosure around dark pools and the underlying activity would be beneficial for their activities. A particular concern is the need for harmonisation of requirements across dark pools.

Conversely, ~40% of traditional investors surveyed believe there is sufficient disclosure at present and that data are readily available through brokers, if requested. Several investors believe that increasing disclosure in dark venues, or forcing dark pool volume towards lit venues, will only serve to benefit HFT strategies and make it harder for institutional investors to execute block trades. A couple of investors argue that the idea of dark pools is that they are opaque and that there is sufficient information leakage at present.

One asset manager is unsure whether dark pools are needed at all, favouring the idea of one lit exchange where everyone can see the trades.

Liquidity

Over 65% of traditional investor respondents find that it is becoming increasingly difficult to tap into the liquidity in the markets they operate. The majority believe that fragmentation and AT/HFT activity have driven down trade volumes on lit venues, particularly in stressed conditions, rendering the liquidity provided on those venues unsubstantial to the traditional investor as they are unable to trade against it. Consequently, traditional investors are forced to

overcome these market depth issues through a combination of algorithmic solutions and use of dark liquidity pools.

However, broker services are seen to have helped many traditional investors overcome these liquidity challenges. Brokers have typically undertaken the task of seeking liquidity on behalf of investors, by additional order working or by providing access to liquidity-seeking algorithms. Consequently some investors are effectively shielded from adverse liquidity developments and have actually noted an overall improvement in their ability to source liquidity through the use of algorithmic solutions. Most of the respondents who have not experienced difficulty in finding liquidity are reliant on brokers to overcome such difficulties on their behalf.

The increasing dependency on brokers for liquidity does, however, come at a potential cost. Some investors raise concerns over the lack of transparency over their broker's execution activities. In particular, concerns centre on the difficulty of knowing whether optimal execution has been realised or whether brokers are biased by the lure of rebates from execution venues. This is one reason cited by several investors who are consequently investing in their own internal smart-order routing solutions.

There is some regional variance around the liquidity impact felt by investors. Asset managers investing in medium and smaller UK stocks feel that they are at a higher risk of being unable to find the required liquidity to execute their trades, but it remains unclear if this is due to venue fragmentation and HFT. Investors active in emerging equity markets have not yet experienced any adverse impacts and remain satisfied with the liquidity available on lit venues.

Several investors note an increase in the volatility of liquidity. Their experience is that when markets enter stressed phases liquidity has a tendency to diminish. Whilst the frequency of such occurrences has increased in recent times, the investors are not sure whether or to what extent this trend has been driven by HFT.

Liquidity as discussed by alternative investors

Over 60% of the alternative funds subscribe to what several refer to as the "consensus view" which proposes that AT/HFTs are net liquidity providers and quasi market-makers. Several funds are adamant in their assertion that liquidity would dry up and spreads would widen in the absence of AT/HFT.

There does not appear to be much difference between the views of core strategic and non-strategic user groups within the alternative segment. In fact the non-strategic users uniformly believe that the liquidity they specifically require to execute trades in the market is either unaffected or improved by AT/HFT participants.

However, a minority of alternative investors posit that AT/HFT strategies increase the volatility of market liquidity, asserting that HFT provides liquidity at times but not necessarily consistently. A few also believe that these strategies create a false illusion of market depth because the strategies are liable to withdraw from markets in stressed periods when liquidity is needed most.

For most alternative investors, the sheer volume of AT/HFT trades on a day-to-day basis offers proof of the strategies' positive effect on market liquidity. Additionally, these funds point to incredibly tight spreads and short average times from order submission to filling as indicators of enhanced market liquidity from AT/HFT strategies.

Market resilience

Volatility

Whilst many investors note the increase in market volatility in recent times, few believe this to be solely caused by AT/HFT activity. The broad consensus amongst those surveyed is that macro-economic conditions remain the primary instigator of market volatility.

Two thirds of participants, however, believe that AT/HFT activity is exacerbating volatility once markets enter a stress period. In particular, AT/HFT strategies are driving momentum trading and create positive feedback loops, resulting in exceptional intraday price movements. In addition, market volumes thin during stressed phases as many AT/HFT strategies withdraw, generating additional volatility.

Some investors who traditionally seek long-term value opportunities are forced to react to such price movements, detracting from their original mandate. In the long-run this is deterring some of them from investing in affected markets.

Few traditional investors have performed their own analysis on volatility. Based on anecdotal evidence, many believe that AT/HFT has increased the frequency of periods of extreme volatility.

Impacts on volatility as seen by alternative investors

Alternative investors' assessment of the impacts of AT/HFT strategies on market volatility is mixed. More than half of core strategic users are decidedly unwilling to assess these strategies as either volatility enhancing or dampening. The remaining core strategic funds argue that macro-economic and other exogenous conditions are the primary drivers of market volatility, while AT and HFT enhance market momentum. One fund in particular offers an example of volatility-decreasing AT, explaining the concept of mean reversion strategies, and arguing that by definition these strategies reduce the magnitude of price fluctuations. There is also a third opinion, shared by approximately 25% of core strategic users, that market volatility should not be regarded as a bad occurrence on its own because its impact can be mitigated as investors continue to trade through it.

Non-strategic users offer slightly more negative views of the impact of AT and HFT on market volatility. Approximately 25% of non-strategic users explain that market swings may well be exacerbated by trend-following computer algorithms. However, these funds – especially where strategies are long-term – do not feel that any action is warranted to address market volatility issues stemming directly from AT/HFT as they are perfectly able to trade through it and have had sufficient liquidity in nearly all instances of volatility.

Price correlation

Traditional investors surveyed believe it is difficult to attribute the increase in observed price correlation between individual securities exclusively to AT/HFT activities. Whilst many believe AT/HFT could be a contributing factor, many other possible explanations are raised. In particular, the increase in investor volumes allocated to index-linked products and passive strategies is seen as a key driver behind the increase in correlation.

Other risks

There is some concern amongst traditional investors that AT/HFT activity is creating broader risks to the functioning of markets. A group of investors, citing the May 6th 2010 Flash Crash as an example, share concerns on the level of human intervention and personnel skills required to effectively and safely deploy AT/HFT in the markets. Several investors draw the conclusion that the risks are not caused by computer-trading tools but rather the people deploying them. Others believe that the challenge faced by regulators and market operators in understanding what occurred during the May 6th Flash Crash is indicative that other risks are present in the market but that they are too complex to clearly identify. Circuit breakers are viewed as an effective preventive mechanism, but some investors point out that they are not yet present in all markets.

To help mitigate operational risks arising from AT/HFT activity, many respondents have begun investing in personnel to ensure their traders are conversant with algorithms; able to understand algorithms active in the market in addition to deploying algorithms for their own trades. Ensuring the skill set of market practitioners grows along with the evolving markets is viewed as essential to mitigate other potential risks.

Policy options and market abuse

Market abuse

Market abuse, as defined in the recently revised Market Abuse Regulation of the European Commission, can consist of insider dealing and/or market manipulation³. In the context of AT/HFT and for the purpose of this report, the focus is on particular automated strategies which are perceived to constitute market abuse because of their distortive effect on the market (e.g. quote stuffing and spoofing).

There is strong conceptual agreement amongst traditional investors that issues relating to market abuse should be addressed with immediacy, with ~40% of respondents seeing it as the most important element of regulation to be prioritised. However, investors are also aware of the practical challenges of implementing control and surveillance measures. They raise specific concerns on:

1. How to differentiate between liquidity providing strategies and market abuse
2. How to address abusive strategies without generating any adverse impact for traditional investors

In fact, more than half of traditional investor respondents mention that detecting whether trades have been subject to abusive strategies is difficult due to the complexity of markets. No traditional investor said they are confident in their ability to avoid being targeted by or detect abusive strategies although several funds use algorithms or choose trading venues to limit the risk of this happening.

The difficulty in detecting market abuse leads them to conclude that it will be even more difficult for regulators to adequately monitor and detect manipulative strategies. ~90% of respondents do not believe that regulators have sufficient data, technology or expertise to effectively detect market abuse.

The consensus view is that advances in technology have, and always will, run ahead of regulation. Some do not believe that regulators will ever be able to keep up with the on-going innovation in the market. This raises concerns that sophisticated HFT strategies will be able to navigate around any restrictive measures that are introduced (e.g. quote to order ratio limits), and potentially even be able to extract informational advantages from them.

While many firms advocate a quicker regulatory response to market developments they remain adamant that the consequences of any proposed measures need to be carefully understood before implementing.

³ Regulation proposals by the European Commission, (20.10.2011); for more detail see http://ec.europa.eu/internal_market/securities/abuse/index_en.htm

Policy options

A wide range of policy measures have been proposed to address market manipulation and ensure a level playing field, which were tested with the users as part of the survey. These included:

- **Micro-structural measures** i.e. those which impose changes to the microstructural operation of the markets; for example minimum resting times or quotes to trade limits
- **Fee and incentive measures** i.e. those which affect behaviour through different financial incentives such as rebates, cancellation charges, market-maker obligations
- **Other policy proposals** – a round-up of other proposals already under policy discussion or raised by respondents, such as restricting co-location

Views diverged considerably across the investor community as to which policy options are appropriate.

Broadly speaking, smaller investors and pension funds tend to favour considering *structural measures*, such as minimum resting times or quotes to trade ratio limits. On the other hand, larger asset managers generally have greater concerns on the second-order effects of any such structural changes to the market and hence tend to favour a review of fee and incentive structures offered by the execution venues such as rebates, cancellation charges and maker-taker pricing.

Micro-structural measures

~60% of traditional investor respondents were supportive of minimum resting times, whilst ~20% were against the concept. Many of those in support reiterate the condition that an impact analysis be performed prior to implementation to ensure potential adverse impacts are fully understood and considered. The support is based on the argument that it would help in filtering out non-genuine market-makers, reduce volatility and would affect HFT rather than traditional investors. The counter-argument is that there will be adverse consequences for liquidity and spreads. One particular concern that is raised is the adverse impact on positive HFT market participants, such as statistical arbitrage firms which ensure price convergence across venues.

Around 50% of traditional investor respondents support a maximum ratio of quotes to trades, with another 40% unsure due to possible negative consequences. Again, those in support reiterate the condition that an impact analysis be performed prior to implementation to ensure potential adverse effects are fully understood and considered. Those supporting thought it would limit gaming strategies and help exchanges deal with data traffic volumes responsible for outages. But other respondents believe this measure to be too impractical to implement. In addition, it is posited that the measure could be advantageous to HFT strategies as they evolve to navigate around arbitrary limits and gain additional signalling information from the presence of a limit.

Fee and incentive measures

There was limited support (~30%) from the traditional investor community on market-maker obligations. Several investors believe it would filter out non-genuine market-makers and

provide extra short-term stability during periods of stress. But in general investors suspect that market-maker obligations would lead to high frequency traders providing liquidity of non-tradable size for traditional investors. Concerns were also raised that this could further damage liquidity if current market-makers chose to not assume obligations and withdraw.

Cancellation charges were widely supported with ~85% of traditional investor respondents believing more stringent cancellation charges should be introduced. However, again, some concerns remain. The motivation for supporting the proposal is that it would help target specific HFT activity that is responsible for the exceptionally high number of cancelled orders (quoted as 85% to 90% in some markets). However, some concerns are raised that most market participants need to cancel orders now and again with legitimate reasons (e.g. reviewing a limit order) and should not be penalised for doing so. A compromise that would limit the impact on traditional investors which was raised several times by respondents would be to apply cancellation charges only when the number of cancellations breaches a defined threshold.

Many traditional investors would like to see a broader review of the fee and incentive structures being deployed by execution venues. The hypothesis is that execution venues are increasingly focused on profit maximisation and hence are employing incentive structures that attract and benefit HFT activity. Consequently, the requirements and needs of traditional investors are being compromised.

A related concern is that rebates offered by trading venues may be leading to a bias within brokers' Smart Order Routing (SOR) systems. The result would be that orders become more exposed to predatory HFT strategies as brokers' preferred venues became known. However, the lack of transparency on where orders are ultimately executed, experienced by some traditional investors, makes this concern hard to validate or disprove.

Other policy proposals

There is strong support amongst traditional investors for the abolishment of co-location services being offered, as they view this to be a flagrant breach of equal market access. Co-location is perceived to be only required for strategies dependent on ultra-low latency and traditional investors believe it is fairer to level the playing field by abolishing such offerings rather than forcing all to invest in the infrastructure.

A broader policy objective that is proposed is to force execution venues to take greater responsibility for policing the trading activities on their own venues. The logic being they have the necessary infrastructure in place to support the surveillance and ought to be incentivised to preserve the integrity of their venue. Several respondents, however, question whether trading venues have a conflict of interest in upholding this requirement.

Some participants were able to express an opinion on the recent MiFID II regulation and directive released in Europe. The regulation contains no major divergences from the proposals previously under consideration (covered above). There is, however, significant concern from investors that the regulation does not appear to take into account the different forms of algorithmic trading being practised (execution only vs. source of trades). Many think the regulatory text will require significant re-drafting before it will attract the required support to be approved and is further proof that regulators do not fully grasp the details of AT and HFT.

Summary of perspectives from alternative investors

The consensus opinion amongst the alternative investors interviewed is that any regulation of AT or HFT should not be undertaken without substantially greater analysis and a better understanding of the issues by policy makers and regulators. Some believe that extensive research is required to determine whether there actually is a problem in the market stemming from AT or HFT. Many feel that any proposed policy options need to focus on preserving market integrity.

Throughout the interview process, a significant number of alternative investors made unsolicited references to the regulatory response to short-selling as a prime example of ill-considered and detrimental market regulation. Funds repeatedly expressed their desire to avoid another such example of 'misguided' regulation.

While there was some difference in the level of support on policy issues between the core-strategic alternative funds and the non-strategic users, the philosophy across these two groups is very similar.

The most obvious and prevalent argument against the regulation of these strategies put forth by alternative investors pertains to liquidity. In fact, more than 90% of core strategic users argue that liquidity would be severely reduced if these strategies were to be hampered by regulation. About half of non-strategic users voice similar concerns. These funds contend that, considering AT and HFT activity constitutes approximately half of all trading volume on US and European equity exchanges, liquidity in those markets would deteriorate significantly if new regulation is imposed that might inhibit such trading strategies. Many would also like regulators to consider the efficiency that is lost due to perceived interference of regulatory restrictions.

Specific policy options discussed with funds receive limited support from alternative investors. Many alternative funds moved straight to concerns about both intended and unintended consequences of any proposed policy action.

In terms of micro-structural measures, multiple funds are open to considering a maximum ratio of orders to trades. A few non-strategic users were comfortable with employing taxes as incentives to favour longer holding periods, however core strategic users strongly opposed this policy option. Several funds highlighted that some exchanges use cancel-to-execution ratios to determine their fee structure and suggest that regulators could adopt this policy more broadly to limit cancellations.

In terms of incentives, a few alternative investors suggest mandating market-maker obligations in order to add to the structural value of their participation in AT/HFT, but most do not view this as critical.

In terms of position level data and data aggregation, some alternative funds believe that regulators could lean more heavily on prime service providers for data to help determine exactly where the abuse and/or problems are, if there truly are any. The SEC currently tags trades and US market participants have been supportive of this policy approach, adding that it greatly improves transparency to regulators.

The alternative funds uniformly cautioned that poorly implemented regulation designed to limit the trading activity of AT/HFT users could have unintended, direct consequences on many other market participants as they execute their trades through the same or similar electronic

portals. For example, the long-only investor who wishes to put on a large block trade electronically would be needlessly hampered by any such regulation.

With regards to quote stuffing, one proposal suggests addressing this issue by charging a minimal fee for every order submitted to the market and keeping track of the orders that are cancelled. Then those participants who submitted orders and did not cancel them receive a rebate. In effect, this would tax the practice of submitting and then cancelling an order, without going so far as to tax all transactions as a Tobin Tax would.

Lastly, several funds took the time to explain their views on the fundamental service that AT/HFT provides to the market. These views offered that, in addition to being liquidity providers, AT/HFT strategies also serve to correct market inefficiencies and dislocations, ultimately facilitating and improving price discovery. Reducing AT/HFT activity would serve only to weaken the price discovery function as it decreases volumes and market participation.

Future risks and benefits

Market structure

75% of traditional investors raise concerns regarding the market structure. A quarter are concerned that the execution venue structure is overly fragmented but believe that the negative aspects of this can be partially addressed via a consolidated tape. Another quarter believes that the evolving market structure has created more opportunities for market abuse.

A significant number of traditional investors surveyed (~15%) question the appropriateness of the governance structures present at execution venues. The view is that execution venues are increasingly focused on maximising revenue to satisfy shareholders, rather than providing a utility to end-user market participants. As a result, some investors feel venues are becoming increasingly biased towards the needs of HFT strategies, to the detriment of the traditional investor.

The role of dark pools is a divisive subject across market participants. On the one hand some investors are satisfied with the price discovery process in dark pools, and increasingly view them as a necessity to facilitate block trades for traditional investors. This group are concerned about the motivations of exchanges to return more volume to lit venues. This, they feel, would only further play into the hands of HFT strategies as dark venues help mitigate the adverse impacts of HFT activity. However, a subset of traditional investors, typically those not active in dark venues, would like to see greater disclosure requirements. A relatively extreme view, supported by a couple of respondents, calls for markets to shift back to central limit order books.

In the context of the next ten years, ~60% of traditional investor respondents are cautiously optimistic that computer-generated trading activity will continue to provide market efficiencies and cost reductions. However, within this group, many highlight the need for constraints to ensure the evolution does not come at the cost of creating an unlevel playing field. A quarter of respondents remain more concerned that the evolution of computer based trading will generate more market abuse opportunities and make detection more difficult; within this group there are stronger views that policy action is needed more urgently to address current issues.

OTC markets

There is a realisation amongst market participants that the current regulatory proposals (Organised Trading Facilities in Europe, Swap Execution Facilities in US) will increase the application of electronic execution to many parts of the OTC derivatives market.

Most investors believe that the OTC markets will become increasingly standardised and electronic but there is disparity in the views regarding the extent to which this evolution will be feasible. Investors make a clear distinction between electronic execution and AT/HFT activity. Whilst electronic execution is a necessity to facilitate AT/HFT activity, it is not the only requirement. Underlying liquidity profile and product demand are other key factors that determine whether a market is suitable for AT/HFT activity.

The secondary bond market is cited as an example that has had electronic execution for over a decade but has not attracted AT/HFT activity. Investors believe this is because either

1. Liquidity exists in large sizes with narrow price spreads (e.g. German government bonds) or
2. Minimal liquidity is present, thus requiring voice channel to source (e.g. corporate bonds)

That said, many investors believe that an extension of AT/HFT activity to the interest-rate swap (IRS) and credit-default swap (CDS) markets is likely.

Opinions are mixed on the effects of this potential development. Around half the traditional investor respondents believe it to be a natural but risky evolution that requires the careful attention of regulators. Approximately a quarter of respondents are firmly supportive of the evolution and the advantages it would bring, whilst the remaining quarter oppose the trend.

Supporters believe it will help increase liquidity and improve pricing efficiency. One specific view is that equity markets have performed better in periods of market stress, suggesting that moving OTC instruments on to organised venues would improve stability due to the increase in price transparency.

Opponents are concerned about the impact on tradable liquidity as institutional volumes are increasingly mixed with volume from short-term traders. Another view is that due to the complexity of OTC instruments, the impact of electronic trading could be even more unsettling for market stability than in the equity markets, with more 'Flash Crash' type events. Some traditional investors are also concerned that executing OTC products on lit venues increases the risk of adverse price movements due to information leakage, as observed for equity block trades.

One pension fund raises the concern that the spreading of electronic trading to OTC instruments will generate more short-term trading and the associated abnormalities that are currently experienced in the equity markets. Another belief expressed is that the more systematic a market becomes, the more market players develop systematic means to make money, thus undermining the goal of the markets.

Many traditional investors believe the evolution towards computerised trading is a natural step, but lessons from the cash equities market should be learned and addressed up front. Most investors are in favour of more electronic trading of all instruments, so long as rules and market access are fair. In particular, traditional investors want conditions to be placed on the market to limit the effects of abusive trading activity and to ensure a level playing field in terms of access to liquidity. The concern is that the evolution of OTC markets will provide more opportunities for malpractice and that some market participants will find means to avoid any regulatory restrictions.

Summary of perspectives from alternative investors

About half the funds that commented on this topic think that a move towards central clearing (in particular the imminent shift of IRS and CDS) would increase opportunities for AT/HFT, and that these strategies would probably broaden in response. The view expressed by some funds is that putting more derivatives on exchange would certainly introduce arbitrage opportunities between newly exchange-traded products and products that remained OTC. Some alternative funds mention that as the costs associated with clearing decrease, the more AT/HFT firms will look to get involved.

One fund believes a transition towards clearing would increase the business opportunities for prime brokers, as AT/HFT firms are likely to expand into new products and would need to expand their books to make it worthwhile. Multiple funds say that DMA usage would obviously increase as products began to be traded on exchange.

The other half of alternative funds do not see a meaningful link between clearing and algorithmic strategies. One fund states that simply putting OTC derivatives on exchange is not sufficient for increasing the scope of AT/HFT. The view is that whilst liquidity in these newly traded products would increase to an extent, it would be insufficient to make these strategies feasible or profitable. Liquidity is most commonly expressed as the factor limiting AT/HFT strategies from spreading. Also, clearers may be unwilling to do business with AT/HFT firms due to the difficulty in establishing margin requirements.

No fund sees the imminent transition toward central clearing as sufficient reason to adopt an AT/HFT strategy if they did not already have one, or abandon current AT/HFT strategies. Core strategic users do not see their opportunities dwindling, and non-strategic users are focused primarily on the execution of their current strategies as opposed to investment in the development of an HFT or AT strategy.

Regulatory process

There is broad agreement across both the traditional and alternative groups on the buy-side on the principles of regulation; ensuring markets are efficient, fair, orderly, transparent and dealing with any practices that are contradictory to this. The concerns centre on defining this in practice and implementing it.

Many traditional investors express concern about their lack of involvement in the regulatory process. The view commonly voiced is that they lack the resources to adequately engage in the process, with the result that the debate is driven by the broker-dealers and the execution venues. The buy-side industry bodies have not been able to help their members in fully overcoming this regulatory process issue.

An over-arching concern of many respondents relates to the perceived confusion in the computerised trading debate between high frequency techniques and algorithmic trading. Many users are worried that in the consultation processes to date it has not been clear enough that policy makers in particular understand the important distinction between HFT and AT. As a result, intentions to limit abusive trading may result in regulation applied to the entire universe of AT with unforeseen and likely negative impacts on end-users' ability to transact efficiently in the markets.

The pace of regulation is an emotive topic. Many respondents feel that regulation has been too slow to respond to the evolution of markets. However, a significant number feel equally concerned at the pace at which regulation is now being pushed through at the risk of inadequate consultation, impact study or cost-benefit analysis.

In terms of regulatory priorities, a consolidated tape for post-trade reporting is highlighted by more than 80% of traditional investor respondents as a key requirement in Europe. Many feel it has been overdue and that it is now clear that the market is unable to find a solution to this issue without intervention.

Dark pool regulation is an issue for many traditional investors. They are particularly concerned by exchanges' motivations to shift trading volume back on to lit venues. Some investors believe exchanges are unfairly advantaged in their advocacy efforts by their legacy relations with national regulators. Several traditional investors say they prefer market practicalities to drive the regulatory debate rather than 'politics'.

40% of traditional investor respondents believe addressing market malpractice is the most important element of regulation, and many others express a strong desire for it to be addressed. The view is that once this issue is addressed the remaining market infrastructure is fit for purpose. A significant number of respondents question why it has taken so long for market abuse to be addressed and believe it has reached the point where it raises questions on the integrity of certain execution venues.

Conclusions

The different roles and uses of computerised trading need to be fully understood and considered before any action is taken to address such activities. In particular the distinction between algorithmic and high frequency trading needs to be much more prominent.

Computerised trading takes many forms and is widespread across financial markets. Algorithmic trading is used by the majority of traditional investors to execute orders in major global equity markets. Most traditional investors view algorithmic trading as beneficial or at least highly necessary to navigate the current market structure.

However, very few traditional investors use algorithms to source trades and none of those surveyed generate or directly execute orders via HFT strategies. A handful of respondents are aware that their dealers might be using HFT techniques in the execution of their orders.

The use of algorithms to generate trades is more common amongst alternative investors, with many deploying dedicated quantitative-driven investment strategies across asset classes. AT and HFT activities for trade generation are differentiated by investment horizon and motive. HFT strategies focus almost exclusively on short-term market dislocations and latency advantages that can be arbitrated. These strategies use algorithms, instead of humans, to identify more fundamental reasons to trade. For execution, alternative investors may use AT but many opt to use DMA services provided by brokers.


Views on many topics differ within the traditional investor group, with the most obvious segmentation between larger investment firms with significant spend on trading and the pension funds and smaller firms with less spend on trading.

Whilst larger traditional investors are more active users of dark pools, both large and small funds are against the proposal of increasing transparency requirements in them. Smaller funds perceive their cost of trading to have decreased, but many of the larger funds remain uncertain as they have experienced greater adverse pricing impacts. Whilst the majority of traditional funds have experienced deteriorating pre-trade price transparency, some large funds remain unaffected by this as they are better able to mitigate the impacts.

Within the alternative investor group, there is significant consensus, and fewer differences between the core strategic vs. non-strategic group than might have been anticipated.

The alternative investor funds engage with the market in multiple ways; from equity long-short funds to quantitative-driven strategies. Despite these differences, the group shares a common philosophical view on many issues raised. As a result, there is limited divergence of opinion within the group on key issues such as liquidity, transparency and market structure.

Table 2 – Traditional vs. alternative investor consensus

 Key areas of divergence

		Traditional investor consensus	Alternative investor consensus
Definitions and use of AT/HFT	Interpretation and use	<ul style="list-style-type: none"> ▪ AT for execution only 	<ul style="list-style-type: none"> ▪ AT for origination, some execution (DMA preferred) ▪ Also some HFT for origination
	Method of employment	<ul style="list-style-type: none"> ▪ Majority broker dependent, limited in-house development ▪ Minimal DMA use 	<ul style="list-style-type: none"> ▪ Primarily DMA via prime broker ▪ AT/HFT developed internally
	Reasons for use	<ul style="list-style-type: none"> ▪ Pricing, anonymity, efficiency 	<ul style="list-style-type: none"> ▪ Pricing, anonymity, efficiency
Quality of trade and market resilience	Dark pools/ATFs	<ul style="list-style-type: none"> ▪ Widely used to execute block trades ▪ Supportive of preserving existing structure 	<ul style="list-style-type: none"> ▪ Limited use ▪ Discomfort around lack of transparency
	Costs of trading	<ul style="list-style-type: none"> ▪ Decreased direct costs (commissions and spreads) ▪ Increased investment (e.g. IT) and opportunity costs ▪ Mixed views on net impact of overall cost 	<ul style="list-style-type: none"> ▪ Reduction in direct and overall costs
	Liquidity	<ul style="list-style-type: none"> ▪ Greater fragmentation mitigated by brokers ▪ Depth diminishes in stress periods → liquidity volatility 	<ul style="list-style-type: none"> ▪ AT/HFT active investors report enhanced liquidity ▪ Others report no impact
	Transparency	<ul style="list-style-type: none"> ▪ Pre trade: price formation has deteriorated ▪ Post trade: decreased, consolidated tape essential 	<ul style="list-style-type: none"> ▪ No concerns around pre- and post trade transparency
	Volatility	<ul style="list-style-type: none"> ▪ Macro economic factors remain instigators ▪ AT/HFT exacerbates volatility via feedback loops 	<ul style="list-style-type: none"> ▪ Macro economic factors remain instigators ▪ AT/HFT exacerbates volatility via feedback loops
Policy options	Market abuse	<ul style="list-style-type: none"> ▪ Activities hard to detect, but definitely affect trading ▪ Should be priority for regulators 	<ul style="list-style-type: none"> ▪ No specific concerns
	Policy options	<ul style="list-style-type: none"> ▪ Action needed ▪ Mixed support for min. resting times, cancellation charges, co-location ▪ Review venue fee structures 	<ul style="list-style-type: none"> ▪ Avoid over regulation ▪ Concerns about adverse market impact (e.g. short selling) ▪ Price diversion and market dislocations would increase

There are few areas where the views of traditional and alternative investors are aligned (see Table 2).

The benefits of using AT for execution are recognised by all types of market participant. All have experienced a reduction in commissions, increased work flow efficiency and market anonymity from the uptake of AT for execution in available markets. Policy reactions need to be balanced to ensure realised gains are not undone and future benefits are not curtailed.

Respondents are aware of the recent increase in price volatility, but most traditional and alternative investors do not attribute AT/HFT to be the instigator of this. The view is that volatility is primarily caused by macro-economic factors, but that AT/HFT activity may enhance volatility in a stress phase. However, most investors believe that volatility should not be the direct focus of any actions taken to address AT/HFT activity.

It remains unclear to investors whether this development constitutes a reduction in the overall stability of financial markets. Some traditional investors draw attention to the additional risks that AT/HFT activity poses. In particular, respondents mention that the incorrect use of these tools (e.g. human error) can potentially have a destabilising effect on markets.

Overall most investors feel strongly that the focus of policy makers and regulators at this point should be first and foremost on tackling abusive strategies, rather than trying to 'manipulate' market characteristics such as volatility, liquidity and market impact costs.

There is a set of issues that are clearly more important to traditional investors than to alternative investors. This is primarily driven by their differing roles and activities performed in the market.

Following the advent of AT/HFT, it is clear to all investors that direct trading costs (commissions and spreads) have decreased. However, the impact on the overall cost of trading is unclear to traditional investors. Additional investment, opportunity and impact costs have offset the direct gains for some participants. Alternative investors are more confident that the overall cost of trading has also reduced. As a result, it appears that the cost benefits of AT/HFT are not shared equally by all market participants.

Pre-trade price transparency has decreased for the traditional investor due to the fragmentation of execution venues and an increase in 'noise' created by HFT. There are unanimous calls from traditional investors for the implementation of a post-trade consolidated tape in Europe, and an increasing belief that regulators will have to impose a solution to this issue. Most investors believe this should be delivered to them cheaply, but there is not a strong view as to whether this is via a utility or a for-profit market solution. Most alternative investors are indifferent or, in many cases, satisfied with current pre and post-trade market transparency.

There are several key issues on which traditional and alternative investors clearly disagree. The motivations of each type of participant need to be understood and carefully considered before action is taken in these areas.

The presence of HFT activity has impacted how many traditional investors trade. Some are increasing their use of market auctions and dark pools in an attempt to minimise interaction with HFT firms. Most traditional investors are particularly concerned that an increase in the disclosure requirements for dark pools will only benefit HFT strategies. Several traditional investors advise that policy makers should avoid the trap of seeking a one-size-fits-all solution on pre-trade transparency, and that increasing pre-trade transparency in all types of execution venue will not benefit market efficiency.

A subset of alternative investors would like to see more transparency in dark pools. In particular, they are discomforted by the relative lack of visibility on the identity of counterparties, trade quotes and liquidity reliability. However, many other alternative investors are ambivalent to the subject of dark pools, expressing content with the current status quo and the ability to execute their trade requirements on lit venues.

Liquidity has become more fragmented for traditional investors, although broker services have helped mitigate the consequences. Traditional investors feel the volatility of liquidity has increased due to AT/HFT, with market depth diminishing in stressed phases, spurring additional price volatility.

Alternative investors take a different view on the liquidity impact of AT/HFT. Non-strategic users see no meaningful effect on liquidity for their trade requirements. However, core strategic users go one step further in stating that liquidity has been enhanced.

Trends in market liquidity need to be viewed in conjunction with developments in trade size. The clear divergence in opinion amongst market participants is driven by different interpretations of what constitutes meaningful liquidity. Note that most traditional investors are looking to execute block trades. Consequently, efficiency gains experienced by some market participants are resulting in the market becoming increasingly inefficient for others.

Traditional investors' concerns centre on the inequality of latency and the potential it offers for abusive strategies. Many think latency-driven strategies undermine market integrity. The reasoning is that such strategies are unsustainable without the presence of non-HFT investors and simply aim to profit from the activities of market end-users. Alternative investors are typically less concerned about latency-driven strategies and take a more positive view centred on the efficiency gains.

The majority of traditional investors are unable to detect when their trades have been affected by malpractice. Issues with post-trade data and complexity of the execution process make this difficult. Based on their own experience, most investors do not believe supervisory bodies are able to monitor and detect such forms of market abuse due to the infrastructure and resource requirements.

There is conceptual agreement that policy makers should focus on addressing abusive market practices but opinions vary on how best to implement this. There is, however, a clear recommendation that the second-order impacts of any proposed measures need to be fully considered prior to any action being taken. In terms of specific measures, cancellation charges and minimum resting times for orders receive most support from traditional investors – with the caveat that reasonable thresholds are set for both to minimise their impact on non-HFT firms.

Alternative investors agree that a comprehensive market impact study is needed before acting. However, they are more fundamentally opposed to the concept of regulatory action. They express a desire to avoid over-regulation and highlight the negative impacts of ill-considered regulation. Many draw parallels to the recent restrictions on short-selling and its perceived negative impacts.

Preserving the integrity of markets is undoubtedly imperative. Policy makers need to ensure they have adequate surveillance capacity at their disposal. They should investigate the option of leveraging execution venues' infrastructure to support surveillance. They may also wish to consider the feasibility of transferring the responsibility of surveillance to the venues themselves. Before implementing any restrictions, an evidence-based study is required to understand the potential second order impacts as far as possible. This will help support measured decision-making in the light of inevitable trade-offs.

The prospect of computerised trading activity spreading to other markets is met with cautious optimism. Many welcome the potential benefits of efficiency gains and reductions in transaction costs. However, traditional investors are concerned that this could provide additional opportunities for malevolent HFT strategies and wish to see this addressed upfront. Well targeted, balanced measures will help ensure financial stability is not compromised by this evolution.

Survey responses

This section presents an overview of the most insightful responses provided to individual questions. It follows the survey structure. For each survey question, a short summary of views is followed by approximately eight to ten quotes which have been selected across a range of end-users to give a tangible sense of typical responses. Selected quotes from alternative investors are included for completeness.

Survey participants were able to select a level of anonymity when responding. Therefore quotes are only distinguished by firm type and primary geography. To improve readability, some responses have undergone minor edits.

A. Impact on how and where you trade

1. Are you engaging in algorithmic trading (AT)?

The majority of investors employ AT in cash equities, with a few using AT for listed derivatives and FX. The key factors motivating their decision to employ AT are anonymity, work flow efficiency and reduced commissions. The volume of trades using AT ranges from 5% to 70%, generally implemented via brokers with a few asset managers employing AT directly. Pension funds surveyed tend to have little visibility into the activities of their broker firms and thus provide little insight into their engagement with AT/HFT.

“We use AT for 5% of our trades in cash equities and listed derivatives in order to help us efficiently source liquidity in dark pools and where liquidity is fragmented across multiple venues. We use exchange member firm provided algorithms.”

– Global asset manager

“We employ AT via external providers because it is a market standard.”

– Regional asset manager, Europe

“We are using broker algorithms but quite sparingly. AT is becoming smarter and we can choose where we want to trade, avoiding HFT if possible.”

– Regional asset manager, Europe

“We employ AT because it enables us to micromanage orders and control costs of execution directly. We use sponsored access algorithms.”

– Anonymous

“We recently invested in new systems to support AT (new order management system). We are trying to build some in-house algorithms which could mitigate the impact of HFT strategies (i.e. anti-gaming algorithms).”

– Regional asset manager, Europe

“[We] employ AT in cash equities and listed derivatives as a result of fragmentation and the need for efficiency after MiFID I.”

– Regional asset manager, Europe

“We employ AT in cash equities (16% by net consideration) [due to] fragmented markets and to gain greater control over our order flow. We use the algorithmic suites provided by selected sell-side houses. [We] recently implemented an execution management system and ask brokers for tags for execution venue.”

– Anonymous

“We would estimate the total [volume of trades using AT] to be around one third of our turnover. We adopted AT due to economies associated with our 'low-touch' order flow (cheaper commissions, greater efficiencies and reduced overall transaction costs), anonymity and the reduction of information leakage. We actively choose brokers who can route orders according to our preferences.”

– Regional asset manager, Europe

“[The volume of trades using AT equates to] direct AT <5% and indirect 23-25%. [We] employ AT due to lower commission rates, workflow efficiency and anonymity.”

– Anonymous

“[We employ AT in response to] changes in the market structure as a result of regulatory and technological developments that led to smaller execution sizes and fragmentation. This necessitated using tools such as AT to implement discretionary portfolio decisions. AT also helps to ensure anonymity.”

– Regional asset manager, US

“[We employ AT for] 30% of cash equities in Europe. [We] moved to a Bloomberg auto management system with fixed connectivity to [our] brokers and this made it easy to implement algorithms from the broker side.”

– Global insurer

“We have access to the "pure" liquidity searching capability of the original client-to-client dark pools (Liquidnet & ITG Posit). We use broker algorithms and in some cases these have been customised for us by the brokers. We find the more direct/aggressive algorithms suffice for our needs instead of DMA.”

– Global asset manager

“We trade via brokers, who might use AT in their execution.”

– Regional pension fund, Europe

“We employ investment management firms to run segregated portfolios in a pre-agreed asset class and style. We do not undertake any direct market trading ourselves.”

– Anonymous

“Yes, [AT is] pretty core to what we do. We are a quantitative manager and the first thing quantitative trading does is producing a signal to buy or sell. Then we look how to place the order.”

– Fixed income hedge fund, Europe

“We have [use] of algorithmic models, actually a number of them on our systematic side. About 50% of our Assets under Management is traded through AT strategies.”

– Global multi-strategy hedge fund

“We have been building models that drill into dark pools [...]. We built a tool that tracks it all the way down to which algorithms we are going to use to execute.”

– Long-short equity hedge fund, US

“Anyone who sits on the buy-side and says they do not use algorithms is lying. They all use AT, but maybe not to make orders go through.”

– Quantitative hedge fund, Europe

2. Do you employ High Frequency Trading (HFT)?

No traditional investors employ HFT, though a few acknowledge that their brokers might use HFT techniques. HFT does not fit the long-only investment strategies of the asset managers, pension funds and insurers we interviewed.

“We do not churn stocks, we are long-term [investors]. I do not think [HFT] would merit the investment it would take to get into the business.”

– Regional pension fund, Europe

“We are traditional investors; we manage money for institutional and retail clients and typically invest on the basis of fundamentals and/or technical analysis. Often HFT strategies are agnostic to both. The cost is also uneconomic for us.”

– Anonymous

“We are real-money, long-term investors with an investable time horizon and holding period of over two years. HFTs have time horizons of seconds, an average holding period of 15 seconds and are, generally, flat by the end of the day.”

– Regional insurer, Europe

“This strategy does not fit with our investment style. We are not short-term speculators. We do not currently have either the technology or programming skills to add value in this area on behalf of our clients. In both instances it would require a substantial and on-going capital investment.”

– Global asset manager

“HFT does not enhance the service that we provide to our clients as long-term investors in the market. We have no proprietary trading accounts, and see no benefit to our clients in adopting HFT strategies on their behalf.”

– Regional asset manager, Europe

“Fundamentally [we are] not a HFT player: we only use AT to mitigate the presence of HFT players in the market.”

– Regional asset manager, Europe

“For us there is no difference between HFT and AT. We are completely model-driven and completely algorithmic-driven.”

– Global multi-strategy hedge fund

“Our quantitative strategy is HFT, but not ultra. There is a volume difference between ultra HFT and regular high frequency trading.”

– Global multi-strategy hedge fund

“We are not high frequency traders and have no intention of becoming high frequency traders. We are just looking at its effects on our business, and for the purposes of options and volatility trading the models and analytics are much more important there.”

– Credit hedge fund, Europe

3. Has the increase in HFT affected your trading? Please explain.

Most firms believe that HFT is affecting their trading, either due to its predatory nature or the artificial liquidity and volatility it is seen to add. Buy-side firms are finding it more difficult to trade in blocks and have shifted towards dark pools as a result.

“Important general point to make here: AT and HFT are linked and the former helps facilitate the latter but they are two different things. AT raises some challenges but is a logical development in the market place, whereas predatory HFT strategies actually challenge the integrity of the market place and its true raison d'être – the facilitation of capital formation and the efficient allocation and transfer of risk.”

– Anonymous

“No – As a long-term investor, with no direct market-execution, HFT is only peripheral in our market focus.”

– Regional pension fund, Europe

“Yes – Although HFT may contribute to tighter spreads in the lit markets, and potentially higher volumes, most of the added liquidity is artificial, in that large institutional orders cannot interact with it to any great benefit. High trading volume does not necessarily mean greater market liquidity for institutions.”

– Regional asset manager, Europe

“Yes – HFT in markets has driven the price spreads down, but displayed size is now much smaller, so child order sizes are also small. As a result, the co-located HFT firms now “pay” a small price for the first look at the order flow, and the scheduled trades of simple participation-style AT strategies can now be detected very easily.”

– Global asset manager

“Yes – We perceive many of these HFT strategies to be predatory so we have to ensure the execution strategies we use do not signal our presence to such predators. There is the perception of increased intraday volatility, smaller print sizes dominating trading volumes and a less efficient price discovery process.”

– Global asset manager

“Yes – It creates fragmentation and volatility in the market place. It has a negative impact on our trading as any orders placed via AT are picked off and front run due to better systems and co-location employed by HFTs. It is not genuine business as a huge percentage is cancelled as HFTs try to gain an advantage by creating dispersion.”

– Regional asset manager, Europe

“Yes – When trading in larger size, we now consider how we can best avoid interacting with HFTs. We have increased usage of market auctions, crossing networks, some dark pools and brokers’ risk capital.”

– Regional insurer, Europe

“Yes – HFT has caused us to analyse all of the executions that we do, and every venue that we use. The market microstructure changes brought about by MiFID I led to many more venues coming online and it was important to understand the quality of the executions that we receive. We have also had to modify the algorithms and continually adapt strategies so that we avoid signalling via regular patterns or trade sizes.”

– Global asset manager

“Yes – HFTs are faster than buy-side investors so market quotes can be stale.”

– Global asset manager

“I would guess some of the guys here who think about this stuff [HFT] would say it is slightly more than just something we ignore. Because of the additional volatility that it can bring, and the inability to see because of black holes and fast trades, we are wary of it. We do not like that more than half the market is traded like this, in short time frames.”

– Regional pension fund, Europe

“The movement by exchanges towards a for-profit model has resulted in activities that may reflect the best interests of shareholders but not necessarily of long-term investors. Exchanges are incentivised to attract HFT firms. [...] As long as markets are not too volatile we have a definite preference to avoid lit markets in favour of the dark.”

– Global asset manager

“No, I do not think we have seen it. We would have seen it in the equity long-short book, but I have not seen it there.”

– Long-short equity hedge fund, Europe

4. Has your use of AT or HFT led to a change in the physical location of your team and/or servers/tech infrastructure? If yes, please explain (e.g. co-hosting).

Few firms have made physical changes to their infrastructure as a result of AT/HFT. A couple have invested in AT management systems but the majority use AT via broker firms. No traditional investor is invested in co-location services as latency requirements are not part of their investment strategy and hence the economics of it are not justified.

“[We completed a] recent investment in new systems to support AT (new order management system). [We are] hiring traders with specialist experience in AT/HFT to understand execution strategies and support algorithmic design.”

– Regional asset manager, Europe

“Co-location of servers promotes a very uneven playing field as it is not available to all. It is not economically viable unless low latency is your principal driver.”

– Anonymous

“The relationship of HFTs with exchanges, including co-location advantages need to be addressed. [The] gains from faster processing power and co-location mean that HFTs can now trade in a fraction of a second, with some boasting figures as low as 10 micro-seconds for a round trip.”

– Regional insurer, Europe

5. If your firm is active in AT, does your firm use their own liquidity searches and algorithms or are you renting algorithms from other intermediaries? Is your firm using Direct Market Access (DMA)? How has your use of these tools changed and how do you see it changing?

The majority of firms rent algorithms from a third party or broker on a pay per trade basis, while a few asset managers are attempting to or planning to build some algorithms in house. Some investors are focusing on smart order routing (SOR) to exert greater control on where their trades get executed. Overall, competition among brokers means that service is good and prices are kept low. Very few traditional investors use DMA because it requires greater focus and attention to execute.

“We use algorithms ostensibly provided by our broker network. We do use DMA, but seldom and opportunistically when we need to react to very short-term price deviations or liquidity opportunities in a lit environment.”

– Global asset manager

“We have selected a short list of AT providers in whom we can have the utmost confidence that the algorithms we are using are protecting our business from being 'gamed', and which do not interact with the more 'toxic' flow usually associated with HFT. We actively choose brokers who can route orders according to these preferences but [are] not sure brokers are always able to comply with our wishes. Currently there is no trading via DMA as it requires much more attention than using an algorithm. With 20 trades to be done a day it is not possible to focus on one order using DMA. AT used to be more expensive than DMA but now rates are comparable and the execution capability of the algorithm is just as good.”

– Regional asset manager, Europe

“We do not use DMA. We are trying to build some in-house algorithms which could mitigate the impact of HFT strategies (i.e. anti-gaming algorithms).”

– Regional asset manager, Europe

“We use sponsored access AT and DMA. We now use more liquidity seeking strategies within the algorithms as the market has become more fragmented over the past few years. We see further fragmentation going forward and more volume crossed in electronic crossing networks.”

– Anonymous

“We rent AT tools and smart routers from third parties. Use of true DMA is rare given the low latency of most order books, but traders still post to some dark pools directly, where interaction remains in the human time scale.”

– Global asset manager

“Predominantly we use broker algorithms where the end-user is able to choose how the algorithm is routed (which venues the broker tries to execute first). Getting the order transacted is smart order routing technology. It is crucial to know how the routing is done.”

Does it go first to an internal pool or sweep exchanges looking for rebates? Does it seek out multiple execution venues? Smart algorithms take into account higher order effects but eventually all orders need to be executed somewhere in the market place. We are generally content with [our] broker experience – competition among brokers is high enough.”

– Regional asset manager, US

“We have a repository of algorithmic tools provided by 15 brokers and would consider developing our own algorithms in the future.”

– Regional asset manager, Europe

“We rely on brokers to supply us with these tools. We do use DMA, again supplied to us via brokers. Our use of DMA decreases as markets fragment and lit order books’ resting liquidity falls. This results in increasing reliance on AT. We utilise brokers’ smart order routing to manage this process.”

– Regional asset manager, US

“We do use DMA, but not high frequency trading. 40-60% of [our] execution is DMA. And we feel that we can do what we want with that tool, no issues.”

– Long-short equity hedge fund, Europe

“DMA has two levels. [I am] assuming we are not talking about sponsored access, but true DMA through someone’s controls. Whoever is providing that DMA has got to have the controls. If Barclays is providing DMA, they have got to have the necessary controls to see who is putting in the trade, how balanced it is, what their book is, and they have to monitor at the sub level.”

– Global multi-strategy hedge fund

B. Quality of trade

6. Has your overall cost of trading increased (taking into account IT Technology/Human Capital/commissions/bid-ask spreads/market impact)?

Most firms have experienced reduced direct costs and increased indirect costs. AT has led to smaller broker commissions, narrower bid-offer spreads and reduced staffing dependency. However, many investors consider that these savings have been outweighed by greater opportunity costs due to market fragmentation and some have incurred greater IT costs. Regional differences should be noted – developing markets do not seem to be experiencing the same increase in trading costs.

“Overall there has been a marginal increase in the cost of trading, probably not more than 5 basis points per trade. Some direct costs, such as commission rates and head count, have decreased as a result of alternative trading venues being used, and greater efficiency in the methods of trading. Other direct costs, such as technology spend have increased as the market has become more fragmented. Indirect costs, such as market impact and opportunity costs, have risen largely because of the increased volatility in markets. It has not yet been proved, one way or another, whether HFT and computerised trading has been directly responsible for this increased volatility, but we suspect strongly that it has been a contributory factor.”

– Regional asset manager, Europe

“No. We are only using third parties that we were already dealing with, so costs are lower. Transaction costs have gone down over the last two years. In a stable quarter trading commissions, overall, are going down.”

– Global insurer

“Yes. Lately spreads, correlation and volatility have remained high whereas liquidity is limited (we would argue that much of the liquidity supposedly added by HFTs is not of any use to institutional investors and therefore is not really liquidity at all). This combination leads to an increase in overall trading costs.”

– Anonymous

“Yes. Increased IT costs and the IT team have offset the savings on commissions and spreads.”

– Regional asset manager, Europe

“No. We trade in emerging markets [where] liquidity increased so market impacts are lower than a couple of years ago. [We see] no evidence that impact costs are rising in developed markets. Commission rates have significantly decreased (probably to half the price of 5 years ago). Bid-ask spreads are lower too probably because of smaller ticket prices. We did not invest in additional IT solutions.”

– Regional asset manager, Europe

“We use an external Transaction Cost Analysis (TCA) firm to analyse our trading cost and compare across our peer group. Using this independent analysis, it is evident that the increased market impact we are experiencing is common across markets that allow HFT. We recommend that HMT invites comments from TCA operators, such as ITG, in regard to trends in the impact cost of trading.”

– Regional insurer, Europe

“Implicit costs are higher and explicit lower. Trading is the same if not more expensive than when exchanges were not for profit organisations. Nothing has changed – commissions might be down but the depth of the order book has gone away.”

– Regional asset manager, US

“In my seat, I would say the costs of trade would be in terms of execution commissions minus rebates plus financing costs in addition to internal capital costs. It is actually straightforward. Costs have stayed pretty flat for our HFT strategy. There have been some fluctuations in execution and DMA commissions, but not more than expected.”

– Global multi-strategy hedge fund

7. In your view, with the advent of AT/HFT since 2007, how has price transparency evolved?

8. What improvements could be made with respect to price transparency? Pre-trade vs. post-trade? Which markets/products? Please explain why.

9. Do you think that there are sufficient clean and accurate historical market data available on trades? Do you consider dissemination of these data to be sufficiently timely? Is it sufficient for back-testing?

Most firms believe that price transparency in Europe has decreased because of venue fragmentation and because market abuse by high frequency traders prevents the formation of genuine prices. Traditional investors are supportive of a consolidated tape to improve post-trade data transparency, including information on where the trade has taken place. Investors emphasise these data should be available at a low cost to all market participants.

“Pre-trade price discovery has become more difficult due to liquidity venue fragmentation. Post-trade transparency has deteriorated due to fragmented trade reporting. There is much more ‘noise’ in the system.”

– Global asset manager

“HFT pricing has no basis other than to take advantage of short-term price discrepancy and has hindered the process of genuine price formation between buyers and sellers. Post-trade transparency has also been hindered by the lack of any consolidated tape of trading data – a major oversight on the part of MiFID. The rules regarding reporting of large-in-scale orders need to be treated carefully, however, in order to prevent a further withdrawal

of brokers' risk capital from the market, especially in the UK where 'upstairs' trading is still seen as an integral part of market structure. Pre-trade transparency is currently adequate for most European markets, where price formation continues to centre on the lit primary exchanges."

– Regional asset manager, Europe

"For large institutional order sizes, a reduction in the displayed depth at each price point has not helped in finding equilibrium pricing levels based on fundamental valuation and real supply and demand. Generally, displayed depth of the market has probably decreased which is detrimental to pre-trade transparency. Post-trade transparency is dependent on the region [...]. In Europe, the fragmentation of post-trade reporting brought about by MiFID I has generally reduced post-trade transparency."

– Regional asset manager, US

"Overall price transparency is decreasing as there is no longer a single exchange; this fragmentation of the market makes it more difficult to see where liquidity is. Post-trade transparency is very important for us [to get] a good sense of what is happening in the market."

– Global insurer

"The functioning of the best bid-offer and price reaction to news has become more immediate. Post-trade transparency desperately needs help. At the moment there is very little clarity as to where executions are being done (40% are marked OTC) and the amount of double counting of trades is still rife – overstating the liquidity position of many stocks. Data are also obscenely expensive relative to the US market and this should be addressed."

– Global asset manager

"[Transparency has] decreased – The actual post-trade [data] provided are only helpful in the aggregate. We want to see where the execution actually occurred. That happens more in the US than in Europe."

– Regional asset manager, US

"[The] true bid-offer spread is hard to see and over multiple venues it is almost impossible."

– Regional asset manager, Europe

"Currently everything is priced based on the incumbent market. At some point price discovery thus becomes ineffective since most volumes are off-market. Alternative trading systems take volume from the incumbent exchange but do not take responsibility for price formation. The issue is where to look to get pre-trade prices? If the incumbent exchange goes down, chances are that other exchanges go down as well. This could be solved through a Trade-Through rule."

– Anonymous

“Pre-trade live price transparency should be consolidated for all lit market venues and available at a low cost for all market users. Post-trade transparency should be improved by the consolidation of all execution venues’ trades into one tape with a low cost access for all market users.”

– Global asset manager

“The proposed European consolidated tape is theoretically the ideal solution – the issue will be ensuring adequate implementation.”

– Global insurer

“Regulators should have an obligation to ensure standardised consolidated data for post-trade.”

– Regional asset manager, Europe

“Consistency and firm rules on trade reporting are required in the equity markets. A consolidated tape would be a big step forward.”

– Regional asset manager, Europe

“For post-trade transparency [we are] in favour of the consolidated tape. Reporting requirements should be tightened, especially in Europe.”

– Global asset manager

“We should have a prescribed consolidated tape with relevant flags to determine the different types of trades. For instance crosses, dividend trades, delayed trades etc. Also why should we have to pay for trade information on our trades?”

– Regional asset manager, Europe

“We are holding out a lot of hope for the consolidated tape. We would have preferred them to pursue a single consolidated tape but multiple would still work. The framework they have set down does not need to be complicated, it just needs to be standardised. [There should be] fewer post-trade flags, but more meaningful. We want to know if flow was worth interacting with, e.g. internal crosses should be visible.”

– Anonymous

“It is the insight. I mean things are changing and we would like more insight. On a day to day basis I do not think transparency has really been much of an issue. It is always going to be in the extremes that there is an issue. In terms of markets in general, I think transparency is lacking, but for me equity is less of a concern. Other elements of the capital structure and away from exchanges are really where I think we need transparency work.”

– Global multi-strategy hedge fund

“Data are immensely valuable to us. We house and mine historical data on an industrial scale. The trend business is predicated around having great data. I think transparency has remained steady if not gotten better over the last couple of years.”

– Global multi-strategy hedge fund

“The data [...] you can get from exchanges or buy from third party vendors are pretty good, but we do not use them too much. When you get into that HFT world, the price data are no longer really worth much. I do not have a problem so much with the data. What I find shocking is the ignorance with which people use those data to validate a trading strategy.”

– Quantitative hedge fund, Europe

“No price transparency issues for us. I think the biggest things are market data costs and settlement costs. There are hundreds of millions of dollars being passed down to investors right now and we have to figure out how to reign those in.”

– Global multi-strategy hedge fund

“Too much post-trade transparency can be bad sometimes. In a less liquid market, post-trade transparency is damaging for market-makers and people who warehouse risk; therefore it can increase the cost of hedging.”

– Fixed income hedge fund, Europe

“I think there can be more improvements in price transparency both pre and post-trade. The more the better! The amount that exchanges want to charge for providing these data is obscene. The regulator can play a big role in mandating that this type of information is produced.”

– Global multi-strategy hedge fund

10. Do you feel more disclosure is needed around dark pools (e.g. which dark pools algorithms reach, where your trades are being executed, etc.)?

Views here are divided. A few investors report that they are currently able to access information on order execution venues, including the use of dark pools, emphasising the need to be proactive in seeking this information from brokers. Some investors believe that more disclosure of information around dark pools would facilitate trading. However, many asset managers are concerned that dark pool transparency would benefit HFTs through alerting them to large trades and expose traditional investors to the risk of abusive techniques.

“We would favour a requirement that brokers supply customers with trade destination, as well as trade venue routing information. This would help with analysing the quality of execution. Public disclosure of venue reporting may create information leakage which could be detrimental to large order implementations. Block exemptions to reporting requirements should be allowed where capital commitments are made for facilitation purposes, but should not be necessary for agency crosses.”

– Regional asset manager, US

“No. These data are readily available if the right questions are asked; market participants should be encouraged to find out how their trades are being executed, as it forms part of their duties in the provision of best execution to their clients. There is no need for this disclosure to be covered by mandatory regulation.”

– Regional asset manager, Europe

“It is surely beholden upon investment managers, as fiduciaries, to understand which venues their algorithms access and the nature of the other counterparties that reside or pass through there. The same would apply if our trades are high-touch rather than AT. We are asking those questions and sometimes it is not possible to get the granularity of information required.”

– Anonymous

“Make dark pools “less dark” for both pre-and post-trade reporting and for brokers posting blocks. There are a range of dark pools [and it is a] good idea to understand which are completely dark and which are not. Potentially use legislation/directive to harmonise trading conditions across dark pools.”

– Regional asset manager, Europe

“More disclosure would help track the dynamic changes made by algorithmic providers.”

– Regional insurer, Europe

“Greater disclosure around dark pools may be counter-productive from a liquidity perspective. For example, if you were to have a specific flag for trades executed in dark venues, HFTs may be able to quickly ascertain with minimum capital outlay what that order is doing.”

– Global asset manager

“[Current] disclosure seems sufficient; the whole idea of 'dark' pools is that they are 'dark'. Data are already available as to where trades are being executed and we control which algorithms we use and therefore know the 'dark' pools they are participating in. We will exclude pools we feel could be toxic. We need to be careful not to become obsessed with transparency.”

– Anonymous

“We do not like dark pools. We like to see liquidity, where it comes from, have it reported on. We do not like short-term bid-offers. We do not like big trades from things we do not understand. We like to deal with real investors, who do not run away and [not] shadows.”

– Regional pension fund, Europe

“We do not play in dark pools. The markets we trade are not suited for those. I would never trust a dark pool now that they have been diluted into smaller blocks.”

– Fixed income hedge fund, Europe

“The size of dark pool activity would be helpful to know. The bigger the pool, the less transparency there is for us. [It is] quite important to know what the percentages of liquidity are doing.”

– Multi-strategy hedge fund, Europe

“I do not think knowledge about the dark pools is the missing link. A lot of that is guys trying to get through big orders.”

– Global multi-strategy hedge fund

“Yes, I think as the HFT stuff remains on main exchanges, the dark pools make it very tough. We do not know what is going on. The market needs better disclosure. If there is a whole world going on that is not disclosed in the same way, it cannot positively impact transparency; in fact it will diminish it.”

– Multi-strategy hedge fund, Europe

“If regulators are trying to regulate dark pools surely they could use more data, but [we are] not sure what they think they need to know. We do not think they really need to regulate them.”

– Long-short equity hedge fund, US

“Dark pools are another area where I have misgivings. In a dark pool, securities trade at a price that is determined by those who make prices known. These players are parasitic on that price, but they do not take risk to reveal the price. That is the issue I have.”

– Global quantitative hedge fund**11. Have you found that it is becoming increasingly difficult/easy to tap into the liquidity in the markets you operate? Please explain why.**

The fragmentation of trading venues has made it more difficult for traditional investors to source liquidity – but for most investors this is mitigated by broker solutions. The macro-economic environment is seen as the key instigator in the decline in liquidity. The key struggle for the buy-side is finding genuine liquidity and trade large institutional-sized blocks.

“In certain markets it has become increasingly difficult to tap into high quality liquidity that leads to low impact volume accumulation. Liquidity venue fragmentation has also been a concern. We have to ensure we use the best strategies to access the best liquidity available across all venues without engaging with predatory strategies that would ultimately affect our market impact during our volume accumulation. These market developments have taken place against a global macro backdrop of increased uncertainty which has also given rise to reduced liquidity.”

– Anonymous

“Fragmentation of markets has not helped the process of finding natural liquidity, and since the global financial crisis, brokers have understandably become less inclined to commit risk capital in the same sort of size as pre 2007. It has therefore become more difficult to deal in size at a pre-determined price or time.”

– Regional asset manager, Europe

“High volatility is the driving factor behind lower liquidity, with market structure changes having a lesser impact. Smart routers are now essential, and liquidity can be ephemeral once demand reaches a threshold.”

– Global asset manager

“Yes, due to fragmentation, we have resorted to old style trading utilising the sales traders and capital. We also use dark pools and Liquidnet, especially in UK mid and small-caps.”

– Regional asset manager, Europe

“Liquidity in the traditional sense is more difficult to access but certainly in good times liquidity is present. It seems less likely to be there in times of stress.”

– Regional asset manager, US

“With investment banks operating with reduced appetite for risk, dark pools inviting HFT to participate (in small size) and the ubiquitous use of AT (slicing large orders into very small size) tapping into liquidity has become harder. Buy-side to buy-side crossing networks have helped but this may be under threat from the MiFID review. Auctions, particularly closing auctions, in exchanges have become more important for the buy-side looking to trade in larger size. If HFTs avoid closing auctions, we believe that the relative importance of these auctions (as expressed as a percentage of "real" volume) is a strong signal that institutions are seeking ways to avoid trading with HFTs.”

– Regional insurer, Europe

“Liquidity is more complex to source, but that is a function of the market microstructure from MiFID I. Algorithms have to source liquidity over many more venues, but this connectivity responsibility is outsourced to our broker providers.”

– Global asset manager

“It is not fundamental to say it decreases liquidity. But I do not think it increases it either.”

– Regional pension fund, Europe

“[It is] definitely getting far more difficult to find liquidity because of the different venues.”

– Global insurer

“Ensuring you can have access to all venues on a high level and micro level can be difficult given the various multi-lateral trading facilities, exchanges and dark pools.”

– Regional asset manager, Europe

“Fragmentation is making it difficult to ensure that we capture maximum liquidity exposure. Liquidity seeking algorithms are useful to capture all venues.”

– Anonymous

“Not to our knowledge, overall liquidity is thin, but we have no issues following VWAP [volume weighted average price]. Obviously the detailed information lies with the brokers who execute.”

– Regional pension fund, Europe

“[We are] trying to stay below the radar of HFT while these traders try to find liquidity.”

– Regional asset manager, US

“One of the concerns we have talked about a lot as risk managers is that HFT creates the illusion of liquidity which may not exist in distressed situations. The HFT money just goes away when things go sour and you have to remember that. What kind of flow can we expect to remain in tough times?”

– Global asset manager

“It has affected liquidity and it has affected exposure calculations. It has definitely been apparent in credit and equities, and global asset prices have been volatile. We have seen that impact on stress test results too. It is definitely having an impact.”

– Long-short equity hedge fund, Europe

“We argue we are enhancing liquidity. [We] certainly feel that at times we are a quasi market-maker. [In] our higher frequency business, we trade all day every day and will trade off price action and off anomalies instantaneously.”

– Global multi-strategy hedge fund

“This is liquidity enhancing for the entire world. The only time it is bad is if there is a glitch that momentarily drives the market in one way.”

– Multi-strategy hedge fund, US

“I think it is difficult to say. There seems to be a recent trend in associating algorithmic trading with abnormalities in liquidity and volatility. They get blamed and people try to use it as an explanation for things they cannot otherwise explain. I think it is possible it could provide liquidity. But what it might do is increase the volatility of liquidity. I do not think it will lead to a long-run drop in liquidity however.”

– Quantitative hedge fund, Europe

“I look at liquidity over an extended time horizon. If you spread a huge order over an elongated time period, I think liquidity becomes generally higher because people compete on the market-maker side, and if you piece it out, you can spread risk.”

– Global multi-strategy hedge fund

12. More specifically, what has been the impact of AT/HFT on your ability to execute large size orders?

Traditional investors have had to move away from lit venues to execute large orders, in order to remain anonymous. Generally, with the help of algorithms, they are successful at sourcing block trades in alternative venues but it takes longer and is more risky.

“In most markets HFT has had a negative impact on our ability to execute large size orders. When we feel it necessary we will look to initially execute large size orders away from lit and any other venues that may have predatory type HFT strategies present. Some algorithmic trading strategies can help with sourcing large volume at certain chosen venues which does help us avoid predatory activity that can have a negative impact on our trade. Liquidity found on lit venues is little use to institutional investors as volumes are too low. Buying small volumes in these venues gives away information and creates a market impact. [It] would be better to get transparency in lit markets right rather than trade in multiple dark pools.”

– Global asset manager

“We no longer rest large orders in a lit order book.”

– Global asset manager

“It is more difficult and takes longer to execute large orders/implement investors’ wishes. It is easier to transact in large sizes in dark pools. Institutional investors are not interested in buying 100 shares and making a profit within the next minute. They want to sell/buy 100’000 shares and identify next year’s winner. HFTs’ liquidity-detecting strategies are likely to discover signals of our trading activity unless we constantly switch venues, strategy and trading counterparty during the lifespan of the order. It is much more difficult to trade anonymously under current market conditions in the lit markets.”

– Regional asset manager, Europe

“[The] automated process now means [an] instantaneous offer could be printed on any number of exchanges. Automation has led to smaller trades, which does not really suit [our] business. Fewer counterparties seem willing to trade on block.”

– Regional asset manager, Europe

“[Our] strategies have changed for large orders (do a little, then use an algorithm for another chunk in order to keep the market impact as low as possible). AT has helped here.”

– Global insurer

“Algorithms give [us] a real advantage for the large orders, especially as they have a prescribed benchmark of conditions to execute against (i.e. order requirements).”

– Regional asset manager, Europe

13. To what extent has there been an impact on the time it takes to execute your trades (since, for example, you need to divide the order)?

Most investors observe that it is more difficult to find a counterparty in the dark venues, thus increasing the execution time of a trade. Dividing orders also adds to trading times. Some firms acknowledge that this could also be attributed to diminishing liquidity in the markets.

“We are still reasonably successful in the dark and via indications of interest but, unless the contra is in the dark venue(s) that we try, it can take longer to complete our order.”

– Anonymous

“The use of algorithms has meant we have been able to access multiple venues in a very fast and efficient way. [However] the general trend in diminishing order sizes has contributed to a lengthening in the time it takes to fill orders and a reduced ability to trade blocks.”

– Global asset manager

“Because of the lack of price in meaningful size mentioned earlier, it is certainly taking us longer to execute our large agency orders in the market. This, however, has less to do with having to split the order than it has to do with the lack of 'actionable' liquidity being advertised.”

– Regional asset manager, Europe

“We now break orders up much more due to the need to access all liquidity buckets and reduce impact.”

– Regional asset manager, Europe

“We definitely need to split orders to fish for liquidity so you can be lucky and immediately find the other side but increasingly it is becoming more difficult as everyone is fragmenting because they think it is the right thing to do.”

– Regional asset manager, Europe

“This is much more difficult to quantify – overall versus pre-MiFID executions are taking longer as overall liquidity (as a function of overall market turnover) is lower. However, we see no discernible increase in execution times.”

– Global asset manager

“My perception is that orders take longer to complete given the propensity to split orders into smaller child orders.”

– Regional asset manager, Europe

14. Do you observe greater price impact? Did execution risks increase (e.g. risk of not being able to execute an order at a certain price and at a certain time)? Please explain.

Many respondents see fragmentation, as well as the perceived longer time to match trades in dark pools, as an opportunity cost to their business. Price impact has also been recognised due to volatility in the markets rather than as a result of HFT. In moving larger orders away from lit venues, investors have experienced increased execution risks, further adding costs.

“In some markets we have definitely observed greater price impact. In the US for example these impacts are sometimes immediately evident once we start to engage with any lit execution venue. Execution risks increase as a result which means we have to keep away from these venues if we can or otherwise use strategies that try to keep our market presence as discreet as possible. Given how these HFT strategies work it is very difficult for us to get orders executed in any acceptable size in a sensible time period.”

– Global asset manager

“Yes. There is an obvious chance of greater opportunity costs arising from not being able to complete our trades in a timely manner; with market volatility on the increase again, these potential opportunity costs have become more substantial.”

– Regional asset manager, Europe

“Impact can be very high at the moment but that is more a function of poor market conditions rather than electronic strategies.”

– Regional asset manager, Europe

“If you transact via fragmented markets, definitely. It may be better to pay up for capital to avoid the volatility caused by HFT and interaction with the order books. If there is a lack of depth in the market then a consequence of that is greater price impact.”

– Regional asset manager, Europe

“Only in times of volatility. Our execution costs tend to track the prevailing market volatility trends, although historically we were able to trade block trades which helped us mitigate some costs. Overall we have not seen a significant increase in costs.”

– Global asset manager

“This depends on [the] benchmark. If using implementation shortfalls as benchmark, execution risks probably increased. If using time or percentage participation, there is no impact as it does what you ask.”

– Anonymous

“We observe greater price impact while trading. Exaggerated price movements may prompt the use of limits that will increase the elapsed time for trading.”

– Regional insurer, Europe

“We do see intraday volatility including extreme moves in prices when accessing liquidity in the market. We manage this by utilising passive strategies, so overall we have not seen deterioration in our market impact. This does increase the risk of increasing opportunity costs, which is difficult to measure.”

– Regional asset manager, US

“Typically, we would switch off of electronic platforms to execute large difficult orders. We would work those manually and use a number of different portals. Right now, there is no problem because our constraints are exchange set constraints, not market liquidity constraints.”

– Global multi-strategy hedge fund

C. Market Resilience

15. In your view, how has AT/HFT impacted market volatility? Please explain.

Whilst many investors note the increase in market volatility in recent times, few believe this to be solely caused by AT/HFT activity. The broad consensus amongst those surveyed is that macro-economic conditions remain the primary instigator of market volatility. The majority believe that HFT exacerbates volatility, especially in times of stress in the market.

“Market volatility has increased due to macro-economic events but the swings seen in the market are enormous. Intraday swings of 5-10% did not happen 5 years ago. Stocks like Amazon are not small cap stocks and a price range of 10% intraday is not normal. That 70% of market volume is accounted for by HFT firms must contribute to market volatility. The current volatility seems to be the highest in the last 25 years.”

– Regional asset manager, Europe

“Our experience is that intraday volatility and high-low ranges are greater in recent years as risk tolerance of liquidity providers has shrunk, and algorithms interpret news flow in real-time.”

– Global asset manager

“Some simplistic AT strategies can trade irrationally and continue to force prices in one direction. HFTs may cause very short-term volatility but would need to close their position quickly so the impact should be limited.”

– Regional asset manager, Europe

“The Bank of England study in July found that intraday volatility has risen most in those markets open to HFT and effectively said that in volatile markets HFT will accentuate that volatility. At best HFT gears up market volatility, but I would suggest it injects added volatility.”

– Anonymous

“As long as the market movement is consistent (i.e. no moves which are larger than plus/minus 2%), HFT does not have a large effect [on volatility]. But in times of [high] volatility, HFT exacerbates it.”

– Regional asset manager, US

“Using signals picked up in trading, HFTs will instantly adjust pricing across different venues in expectation of continuing order flow. If the original trade is part of a much larger order which carries on in the market, this behaviour will reinforce itself into increased intraday volatility. However, if HFTs are generally flat by the close this need not affect volatility as measured by COB pricing. Poor use of AT has increased volatility.”

– Regional insurer, Europe

“[Volatility is] not necessarily due to computerised trading and could be because everyone is being regulated in the same way. The more regulated, the more everyone is treated the same way, the more everyone acts the same way thus making it harder to trade.”

– Regional insurer, Europe

“When markets are in stressed phases, algorithms might contribute to volatility/feedback. Algorithms do not produce initial volatility, but add to it.”

– Global insurer

“HFT strategies in my opinion are not all market-making activities some are more price-making as their strategies are connected across underlying equities, derivatives and Exchange Traded Funds. So it is not always transparent to see the effect of HFT activity on the underlying asset price. Algorithms by their very nature slice order sizes in ever smaller sizes and search multiple venues and some post simultaneously thus giving a false impression of the market moving for a specific reason rather than because the "machines" are catching up.”

– Global asset manager

“We believe that volatility may not be caused directly by AT/HFT, but is more likely a result of fundamental issues that create uncertainty about asset valuations. However, AT/HFT may exacerbate the formation of new equilibrium pricing levels. In other words because of HFT or quantitative momentum strategies our AT needs to "keep up with volume" regardless of price. This may lead to under/over shooting of price discovery.”

– Regional asset manager, US

“I think it creates volatility. Look at the Flash Crash; no one knows what happened. Was it that crazy automated thing? I do not think that stuff is useful. We still do not know what caused it. But it is clear to me that this stuff was part of the cause. So I would say that it creates volatility.”

– Regional pension fund, Europe

“Interesting [question but] difficult to generalise. Various mean reversion strategies in equity space help to argue it dampens volatility. When we see bank A falling and bank B rising, we buy A and sell B. We think mean reversion would make us money. So I would argue that it is counter-volatile.”

– Global multi-strategy hedge fund

“The frequency of the trades actually reduces the risk number. Regulators should look at maximum intraday value at risk. We measure it real-time, we set limits, we set directional limits per exchange, per stock, per sector and go from there. We have a number of different limits to stay relatively neutral.”

– Global multi-strategy hedge fund

“At times it would appear that HFT adds to volatility but who knows? It is really hard to tell. The market seems bashed around by bigger macro-economic issues, so the question is how much of this is really the effect of HFT?”

– Multi-strategy hedge fund, Europe

“People would like to think models are not correlated with the market, but I think there is enough correlation that there is a contribution to volatility from HFT.”

– Global multi-strategy hedge fund

“I think it does add volatility to the market, but only in times of stress, if someone is unwinding a position.”

– Multi-strategy hedge fund, US

“Depends what you call volatility really. Single stock volatility is certainly decreased as a result of HFT or AT.”

– Global multi-strategy hedge fund

16. Considering potential correlation among high frequency strategies, in your view have trading behaviours of HFT firms increased the risk of positive feedback loops which then exacerbate sharp movements in the market?

The buy-side generally believes that computerised trading is a contributing factor to these feedback loops, but other contributing factors cited include the volume of index-linked products. While not many respondents gave much insight on this topic, most investors acknowledge that correlation is a product of market conditions, made worse by AT/HFT.

“Yes undoubtedly. HFT strategies, by their very nature, lead to positive feedback loops, which then form momentum in a stock that did not previously exist. Algorithmic trading too can have similar effects on momentum if the algorithm being used does not adopt anti-gaming technology to prevent this kind of behaviour.”

– Regional asset manager, Europe

“The perception is that many HFT strategies utilise certain market signals in their calculation of how they are going to behave. It is therefore quite possible that any signal given may produce an exaggerated reaction by correlated strategies.”

– Global asset manager

“Yes if the buy-side were not in the market there would be very little HFT as evidenced by the times the markets have been down, e.g. LSE and Euronext. They are effectively scavengers living off and creating noise from genuine market participants. Holding a position for a millisecond is not investing in my view.”

– Regional asset manager, Europe

“There are more volatility spikes in general, so correlations do increase. [Higher correlations] could point towards HFT or just the volume of money in the index e.g. Exchange Traded Funds. Fear or panic in the market leads to everyone selling the index. [One] could argue that before AT the traders were causing correlations but now firms have to reduce their risk in any one day so that causes correlation. HFT is definitely not the only culprit.”

– Global asset manager

17. What other risks, if any, do you perceive from computer based trading (e.g. second-order effects)?

A number of investors have concerns about the risk of human error and technological failure in computerised trading. Other risks cited include the possibility of investors moving away from the equity markets if they become inefficient, and the fact that HFT strategies cause an uneven playing field for investors.

“Where computers are making investment decisions, adequate controls around risk management and exposures are necessary to address program malfunction.”

– Regional asset manager, US

“Even though the LSE has probably lost more market share than any other major European exchange, price discovery is still happening at the LSE. If Chi-X became the dominant execution venue price discovery could be impaired.”

– Regional asset manager, Europe

“[Other risks are] increased number of trades, further reduced average trade size, further increased volatility, ultimately increased cost of trading. 'Flash' orders trying to manipulate markets, HFTs sending thousands of orders/cancellations to slow up the order book in order to take advantage of forced latency.”

– Regional asset manager, Europe

“The risk of systemic failure from communication channels being clogged with HFT message traffic. We argue that excessive message traffic (cancel/trade ratio) should incur a small cost penalty.”

– Regional asset manager, Europe

“Unfamiliarity of the users with the tools [is the danger]. Often issues arise not because of the use of an algorithm per se but because the user of that algorithm has not fully understood its methodology or applied the appropriate parameters to the trade, or has actually chosen the wrong algorithm.”

– Anonymous

“Any computer-based strategies that are predatory in nature have to be high-risk. There is a risk that by reducing the efficiency of equity markets, investors will choose to trade across other asset classes instead. Taken to its end the conclusion would be very negative for global capital markets. Ideally there should also be alignment between short-term speculators and longer-term investors in any market.”

– Global asset manager

“It has become less transparent how an order is valued due to all the rebates/negative rebates offered. From these incentives it is clear that order flow itself has value even without looking at earning the spread.”

– Regional asset manager, US

“Many HFTs shut down in stressed conditions. One of the major issues around HFT trading is the total value/volume traded in HFT which has accelerated quickly. This is concerning as other participants adopt strategies [relative] to these average traded volumes. HFT has caused air pockets of liquidity – high volume of unreal liquidity means investors are making decisions based on unreliable information. [Additionally,] HFTs are trading to price electronically, sending orders into the market to detect liquidity which is not the point of markets. This results in an uneven playing field if rules do not prohibit these activities.”

– National asset manager, UK

“[There is a] risk if you are losing track of what you are doing/what the algorithms are performing. [Therefore firms] need very strong IT and traders with relevant expertise to ensure adequate oversight and control of AT.”

– Global insurer

“In terms of volatility you can look at the Flash Crash, where the concern is that the algorithms lose control and cause systemic meltdown. I really do not know if there is something there or not. The market came back, and there was analysis done that pointed to human error, fat finger risk, and that of course is not the algorithm’s fault.”

– Global multi-strategy hedge fund

D. Policy Options

18. What elements of market structure do you think should be under review by policy makers?

There is clear consensus among respondents that the current market structure could be improved upon. Most respondents would support a review of trading venues' fee structures and server co-location, which participants see as creating an uneven playing field. Several firms suggest focusing on maker-taker pricing.

"I am in favour of investing in technology but HFT firms must not be allowed to gain advantage over traditional investors because the playing field is not level. A wide range of incentives could be considered as the second-best solution after banning unfair activities."

– National asset manager, UK

"Exchanges are now competing with multi-lateral trading facilities as profit-making trading organisations. They have lost sight of their origins and are in thrall of HFT firms who trade over 50% of volume, but stay flat by the end of the day. HFT firms act like parasites. They survive by taking advantage of the order flow from retail and institutional long-term investors. Investors can live without HFT. HFT cannot live without investors. The relationship of HFT with exchanges, including co-location advantages, needs to be addressed."

– Regional insurer, Europe

"Ideas that could be considered are fee structure and spread monitoring. The issues are more pressing in the UK than in continental Europe, since the deal size in the UK has declined and fragmentation is greater than in Europe. For UK asset managers, liquidity in smaller stocks is becoming a problem."

– Regional asset manager, Europe

"The potential conflict of interest in the for-profit exchange model [should be reviewed]. HFT firms generate turnover and fees but the public function of facilitating capital formation relies on long-term investors. This review would include maker-taker pricing schemes, order type disclosure and disclosure of data feeds that are commercially available."

– Regional asset manager, US

"All exchange member firms should be responsible for the trading strategies used by them and their clients. All algorithmic and HFT strategies should be signed off by respective regulators. Anti-gaming technology should be used by all exchanges. The fragmentation of markets should be the subject of constant review since there seems to be a focus on explicit trading costs at the expense of implicit trading costs like market impact."

– Global asset manager

"Transparency on where trades are executed is important – it helps to understand other participants' and brokers' models. The fee system on exchanges incentivises the wrong

activities. We cannot turn back the clock on the rebate model but it needs to be more explicit.”

– Regional asset manager, US

“Maker-taker pricing [should be reviewed because it can] create a false impression of price and liquidity. [Secondly], server co-location goes against fair and equal market access and promotes an uneven playing field.”

– Anonymous

“Banning the maker-taker model would do a lot of good.”

– Regional asset manager, US

“Authorities should consider all policies which are sensible in their considerations for regular market users (i.e. non HFTs). There is a risk however that when HFTs feel there are too many restrictions in a given market, they shift their focus to other markets, resulting in a loss of liquidity.”

– Global insurer

“We do not have a lot of problems with the overall situation today. We would prefer buy-side only own-crossing networks to regulatory rules.”

– Regional asset manager, Europe

“A regulatory approach could work I suppose, but there is the omnipotent technology problem. It is tough to have the regulators using worse technology to police better technology.”

– Global multi-strategy hedge fund

“[...] Most of the ideas regulators have right now are off the mark. The short selling ban has not done any good and it has not stopped the market going down. It started in 2008, and here in 2011, we are at the same spot. These types of rules target one group, but it hits everyone.”

– Multi-strategy hedge fund, Europe

“Market integrity is where the focus should be. If integrity deteriorates, then we have a very big problem on our hands. [We] need to find evidence that this is happening.”

– Hedge fund trade organisation

19. What would be the effect of introducing minimum resting times for orders? What would be the effect of incentives to favour longer holding periods? Please explain.

Some respondents believe that introducing minimum resting times would reduce manipulative HFT strategies and that traditional investors would be little affected by such a regulation. Other firms argue that minimum resting times could negatively impact liquidity.

"[Minimum resting times] need considering in the light of the effect upon those potentially beneficial HFT strategies, i.e. statistical arbitrage strategies, which actually improve price efficiency by eliminating inconsistencies between markets. [...]The broader question of latency, i.e. slowing down access to all, is surely part of the solution."

– Anonymous

"The effect of introducing minimum resting times for orders would be to reduce volatility and increase liquidity. It would also help reduce predatory gaming strategies. Incentives would have to be carefully considered; the exchanges are clearly keen to do whatever they can to attract liquidity so any such structure would have to take all market participants' needs into consideration. Ultimately though, any market participant should be able to pull an order at any time if the circumstances warrant it, so there may have to be some kind of trade-off."

– Global asset manager

"This would negate technological advances brought about by MiFID I."

– Global asset manager

"I think bid-offer spreads would widen and volumes would fall as people would be more defensive around the orders they were willing to submit to the market."

– Regional asset manager, Europe

"[Minimum resting times could cause] wider spreads and possibly less displayed liquidity. We do not support this idea."

– Global asset manager

"Minimum resting times would make sense as they would help genuine business."

– Regional asset manager, Europe

"Minimum resting periods would not materially affect retail or institutional investors and would help discourage some HFT strategies."

– Regional insurer, Europe

"Minimum resting times would go some way to preventing gaming and flash orders. Any order that has multiple entries and cancellations within the course of micro-seconds must

be considered as manipulative. The minimum resting time of any order should surely be at least long enough for the human brain to be able to register its presence!"

– Regional asset manager, Europe

"I would favour both minimum holding periods and taxes. I think [HFT] is a socially useless activity which makes life harder for traditional managers with a longer-term outlook. I think a timeframe under a day [...] is a bad thing to encourage."

– Regional pension fund, Europe

"Minimum resting times – e.g. half a second holding period would stop some price manipulation by HFTs."

– Anonymous

"Longer holding periods are fine and actually great for us."

– Fixed income hedge fund, Europe

"I think minimum resting times are dangerous, they will just widen spreads."

– Global multi-strategy hedge fund

20. What would be the effect of introducing a maximum ratio of orders or quotes to trades? Please explain.

Respondents' views on a maximum ratio of orders to trade are mixed. One argument is that the measure would remove market noise and limit opportunities for manipulation. Another opinion is that it would be difficult to implement in practice or could even be used by new strategies to gain information about order sizes.

"Markets should be about genuine business and not just day trading so [a maximum ratio] makes sense. Current estimates are that 85% of orders are cancelled."

– Regional asset manager, Europe

"[A maximum ratio of orders to trades] should also go some way to reducing impact because it would remove a lot of noise in the markets in the form of the amount of bids/offers that are input and removed in a very short space of time without an execution taking place. Genuine liquidity would then improve. This may lead to price discovery suffering and a potentially artificial market if not addressed properly."

– Global asset manager

"This would help identify perpetrators of [market] abuse, and effectively put limitations on the amount of gaming being done in the market by computer models."

– Regional asset manager, Europe

“We support this; [there could be an increase in] systemic risk from message overload.”

– Global asset manager

“[A maximum ratio of orders to trades] may aid exchanges to deal with the exponential rise in data traffic that has caused so many outages over the last 18 months; however this may prevent genuine liquidity orders that we may interact with from entering the market.”

– Global asset manager

“We would favour a pilot program or a move to [a maximum ratio of quotes to trades]. [Another example is] taxing message traffic which creates more and more expense to increase bandwidth.”

– Regional asset manager, US

“[It seems] hard to come up with a number for a maximum quotes ratio but clearly there is a threshold of reasonableness.”

– Regional asset manager, US

“It may help if you have decided you wish to remove HFT from the market [but] it will make it difficult for brokers to hedge their risk books. I think this could be hard to implement.”

– Regional asset manager, Europe

“[Such a ratio] could be de-engineered to discover the size of an order; there are already strategies/programs that focus on this.”

– Anonymous

21. In your view, would market-maker obligations help tackle the problem of a sudden liquidity withdrawal? Please explain why.

Most respondents are sceptical that market-maker obligations would prevent sudden liquidity withdrawals. The opinion expressed most often is that this would mainly provide short-term market stability for small volumes which could be done more effectively by circuit breakers.

“Market-making obligations would provide extra stability and decrease the risk of a feedback loop.”

– Regional asset manager, Europe

“Probably, but the sizes these ‘Electronic Liquidity Providers’ post are insignificant from an institutional perspective. While it may help prevent a recurrence of the Flash Crash scenario it would be a misnomer to describe the function as true market-making unless

accompanied by minimum size requirements. Additionally, particular HFT strategies would need to be properly understood since not all HFTs are 'liquidity providers' so a blanket obligation would not be appropriate."

– Anonymous

"Perhaps [it would help]. But participants via Direct Market Access could be market-makers – it is very difficult to regulate."

– Anonymous

"Sudden liquidity withdrawal is only part of the problem of providing latency advantages (co-location) to HFTs. The answer is to remove the risk of market abuse through the provision of an unfair advantage rather than providing a status that introduces obligations. The policing of market abuse strategies would still be required."

– Regional insurer, Europe

"Market-making obligations on high-frequency traders may help stabilise prices in the short-term during a period of stress, but ultimately would not prevent the herd mentality of sellers in such circumstances, whether computer trading or manual. We would be more in favour of periods of suspension (either index or stock-specific)."

– Regional asset manager, Europe

"Yes, but it may only slightly delay any large movement that the market may naturally be trying to make. Adding tighter circuit breakers to market-maker obligations may need to be looked at more closely."

– Global asset manager

"Not convinced on [market-maker obligations], circuit breakers are a better idea."

– Global asset manager

"It may help for small scale orders but if you have a large block to place market-makers will only be obliged to quote in "normal market size."

– Regional asset manager, Europe

"We do not believe market-maker obligations would necessarily be much of a benefit. [...] We do not believe that the obligation side would be upheld in times of market duress."

– Regional asset manager, US

"No I do not believe it would [help]. Some [market-makers] would choose not to assume the obligations and withdraw, making our liquidity position worse."

– Global asset manager

"[Market-making obligations are a] bad idea. Traders need the ability to pull orders in the event of an incident/market moving event."

– Anonymous

22. Do you see any potential benefit from cancellation charges on orders? Please explain.

Respondents' views on cancellation charges are cautiously positive. Many firms however are concerned that this would impact all market participants unless cancellations charges are only implemented above a certain threshold.

"Something does need to be done about the false liquidity picture created. Cancellation charges are one possible solution."

– Anonymous

"This is a good idea; it is unlikely that there would be any meaningful side effects."

– Regional asset manager, Europe

"Yes I believe there should be a minimum cancellation fee which would have a huge impact on HFT."

– Regional asset manager, Europe

"[Charges on] cancellations over a certain percentage should be implemented. Currently over 90% of orders are cancelled, which causes false markets."

– Regional asset manager, US

"Possibly, but ultimately this would increase transaction costs for everyone. Even the algorithms we use utilise the cancel and replace function as market dynamics change."

– Global asset manager

"Cancellation charges would curtail HFT activity but could also prove a drag for real investors. This would require careful consideration."

– Regional insurer, Europe

"Yes but [a cancellation charge] should be a threshold-based nominal charge."

– Global asset manager

"Some orders no doubt have a legitimate reason for cancellation; any imposition of charges may create less confidence in the market structure rather than giving rise to any benefit from preventing non-genuine orders being entered."

– Regional asset manager, Europe

“[Cancellation charges] would just be a tax on the market and would discourage people from advertising their business if they were charged when conditions changed and they needed to move a limit.”

– Regional asset manager, Europe

“If HFT firms send 5000 cancellation instructions to slow up a multi-lateral trading facility then there should be a charge. However, I feel that the negative impact of HFT can be controlled by regulations.”

– Anonymous

“Cancellation charges, yes I like that idea. I think a timeframe under a day, or even under 3 months for some players [is bad]. If you can somehow dis-incentivise noise, then things would get cleaner. [HFTs] have no view on the actual stock.”

– Regional pension fund, Europe

“Cancellation charges will be a tax on investors, and provide no value at all. It will just remove liquidity and drive up transaction costs.”

– Global multi-strategy hedge fund

E. Market Abuse

23. Do market practices such as flash orders/wash trades/gaming/spoofing/quote stuffing negatively affect your business? Please explain how and why and whether these practices would have prompted you to change your investment strategy.

Many traditional investors believe they have been affected by manipulative strategies. Respondents largely agree that it is difficult to find evidence for market abuse or quantify its impact on their trades. To avoid being targeted by manipulative strategies, firms attempt to employ more sophisticated algorithms and choose trading venues diligently.

“All of these practices are suspected at times but to identify any one at any specific moment is not always easy. Our perception of the overall abusive practices of certain HFT strategies does influence the way we trade. Gaming as defined here equates to what we call a momentum ignition strategy and is something we see evidence of quite often. It can increase market impact and make it more difficult to execute block orders.”

– Anonymous

“All these forms of market abuse have probably had some sort of negative effect on some of our trading from time to time, but the problem lies in detection. Brokers are unlikely to admit that their trading systems were unable to prevent orders being affected by manipulative strategies. We make sure our AT counterparties have done their utmost to prevent [that our trades are gamed] and that our own traders are aware of these tactics.”

– Regional asset manager, Europe

“[It is largely] unknown exactly how these strategies impact our business but I would expect regulators to identify such practices and act accordingly.”

– Regional asset manager, Europe

“We believe we have experienced all of these manipulative strategies but we cannot be absolutely certain.”

– Regional asset manager, Europe

“We view these types of orders as predatory and as an attempt to open up the market to the detriment of retail and institutional investors. Some of these types of strategies lead to gaming and ultimately a market impact that leads to higher costs to the investor. We try to avoid venues that allow these types of strategies but it is very difficult to find evidence that market abuse has occurred. These strategies should be banned.”

– Global asset manager

“The main issue is that we need to pay a lot of attention [when executing orders] which can impact execution costs. We are also trying to address this with anti-gaming algorithms.”

– Regional asset manager, Europe

“We attempt to employ ever more sophisticated algorithms to counter these strategies.”

– Regional asset manager, Europe

“Flash trades lead to unnecessary information leakage. We need to be aware of the practices of brokers and venues, and manage who has access to our order flow to be able to maintain best execution on behalf of our clients.”

– Regional asset manager, US

“These strategies are unethical or even illegal. Wash trades create false liquidity but we would only be able to identify them in the small/mid cap space. Manipulative strategies can affect asset prices and therefore we will complain/withdraw from a venue if this happens.”

– Anonymous

“Wash trades corrupt the trading data used in Transaction Cost Analysis which is an essential step in best execution. They should be discouraged.”

– Regional insurer, Europe

“Spoofing is illegal and draws orders into trading at the wrong price. We suspend our order if we see evidence [of manipulation] but more than likely it would happen within seconds.”

– Anonymous

“Quote stuffing is a systemic risk and should be controlled through a pricing mechanism. Gaming strategies are perhaps best handled by anti-gaming measures in algorithms. To some extent all market participants are gaming against each other.”

– Global asset manager

“According to the FSA quote stuffing does not take place in Europe but if 95% of orders are cancelled before being executed then you would think an element of that represented orders which were never meant to be executed.”

– Anonymous

“Well I think that considering all of the above are abuse, by definition they should be addressed. They certainly should be scrutinised to a great degree. The problem is trying to observe them with technology that is vastly inferior.”

– Global multi-strategy hedge fund

“Quote stuffing happened on the day of the Flash Crash. There was a single exchange that was the source of these quote stuffing events and there was possibly only a single participant. What happened was that a single stock would get 5000 quotes in a second, and then they were all cancelled instantly. We definitely see this as market abuse and it could get worse.”

– Global quantitative hedge fund

24. Please state any other market abuse activities that affect your business and explain what it entails.

Several firms comment on the negative impact of order cancellations and the abuse of trading venues' fee and incentive structures.

“Regulators should be aware that rebates offered by exchanges have a big impact on a broker’s decision on where to route orders. HFT firms may be able to anticipate trading patterns formed on the basis of fee structures and this can lead to a negative market impact for investors.”

– Global asset manager

“Sometimes we see that when you lift the first offer, the bigger offer above it will disappear very quickly. We are careful not to put in trades to market but rather put a limit on it to make sure we do not get straight executions.”

– Regional asset manager, Europe

“Paying traders to transact with a flat P&L when this will merely result in clocking up fees or rebates offered by exchanges for providing liquidity is not fair and proper.”

– National asset manager, UK

“Selective disclosure of price sensitive information by market participants can hinder our investment discretion. This is difficult to monitor by the authorities as it can often be done by the developing use of social media.”

– Regional asset manager, Europe

“HFT that involves excessive order cancellation is at best an irritation and at worst an abusive practice. It creates an illusory order book which is effectively opaque to most participants.”

– Global asset manager

“The front-running of our orders is an activity that we would like to abolish. Whether it is executed by the use of computer-based programmes or not, it abuses our trade information and causes unnecessary costs. Also, flooding the market with orders for the sole purpose of getting information and then cancelling the orders should be investigated.”

– Global asset manager

“[There is a] particular HFT strategy that targets Bloomberg newswires and trades stocks mentioned in the news before anyone else gets to react. This is a form of insider trading.”

– Regional asset manager, Europe

"[We are concerned about] strategies which deliberately seek out algorithmic orders for the sole purpose of impacting the market price and behaviour of the algorithm."

– Global asset manager

"Everything that is market abuse should be banned. The problem is blocking abuse without negatively impacting liquidity or traditional investors. The focus should be on creating good incentives, e.g. having participants pay for setting up prices."

– Regional asset manager, Europe

25. Do you feel there is existing adequate oversight, data and expertise to detect market abuse?

Survey respondents agree that technological innovation is one step ahead of regulation, making it exceedingly difficult for regulators to detect market manipulation.

"Gains from faster processing power and co-location mean that HFT firms can now trade in a fraction of a second. How confident is anyone that there is existing adequate oversight, data and expertise to detect market abuse if trading can be done across countries, markets and trading venues quicker than the blink of an eye?"

– Regional insurer, Europe

"No. When we have spoken with the FSA they have confirmed that nobody was investigated for quote stuffing via algorithms during 2010. We see this with great frequency."

– Global asset manager

"No. Monitoring has yet to catch up to the micro-second trading world."

– Global asset manager

"No, there is no way that the current regulatory authorities have the expertise or capabilities to detect or enforce market abuse."

– Regional asset manager, Europe

"Probably there is not [enough oversight]. Additionally, it is not recognised that certain activities by trading venues and market participants such as co-location work against the fair and equal access to the market."

– Anonymous

"No. With technological advances the term 'market abuse' seems to have been re-classified and accepted as part of normal practice. Regulators, the FSA included, need to

look at the classification of professional market participants [to ensure] a level playing field.”

– Anonymous

“Given that all markets are now electronic there should be sufficient investment in surveillance systems to monitor undesirable trading practices and stay abreast of trends. Exchanges are clearly incentivised to maximise volumes but the trading venues and their members should have responsibility to police and control trading as regulators are unable to oversee all market activities.”

– Global asset manager

“Current regulation is probably too loose but regulating trading is nearly an impossible task.”

– Anonymous

F. Future risks and benefits

26. In your view, which will be the main risks and benefits of computer-generated trading in the next ten years? Please elaborate your response with respect to financial stability, liquidity, price efficiency, transaction costs and market abuse.

Respondents largely agree that computerised trading is an efficient execution method. However, many firms are concerned that without appropriate regulation and constraints, computerised trading could harm market integrity and financial stability.

“HFT is a form of market manipulation and is a huge violation on the market. When there is a fill rate of less than 0.01% for a market participant, it is indicative that the object is not to transact but to manipulate and for some reason this has not been addressed.”

– Anonymous

“We have seen over the past two years a concerted effort by our brokers to develop market based solutions to combat a lot of the issues that affect our ability to implement portfolio decisions. We would expect this to continue and improve. The main risks will be the continued erosion of public trust, especially if exchanges are seen as representing HFTs at the expense of the long-term investor.”

– Regional asset manager, US

“The biggest risks are to financial stability, especially when computers are entrusted to perform tasks quicker than human common sense can dictate. Unless distinction is made between certain types of computer-programmed trading, and curbs are placed on the more opportunistic types, the next ten years will see an increase in instability of markets, further loss of confidence and an erosion of market integrity.”

– Regional asset manager, Europe

“[Our concern is] that without the proper constraints, and with the equality of latency being provided to the exchange, institutional order flow will segregate into a secondary market.”

– Global asset manager

“Computer-generated trading could go a long way to helping market efficiencies and costs if the predatory element could be removed. The benefits are fast access to multiple liquidity venues, highly cost efficient algorithms, and improved price discovery and market stability. A risk is the increased dominance of the market by short-term speculators, resulting in a move by larger institutions to attempt trading off market and accordingly higher market impact.”

– Global asset manager

“[The risks are] less market depth, higher volatility, more opportunities for market abuse through technological advances and fragmentation reducing the reliability of Transaction Cost Analysis. [The benefits are] tighter bid-offer spreads and lower commissions.”

– Anonymous

“I believe there is a risk technically advanced market participants could always be one step ahead of the regulators and other market participants.”

– Regional asset manager, Europe

“We see many risks such as the roll-out of MiFID equity provisions across other asset classes, use of smart order routing across fragmented markets, lack of understanding of HFT activity and lack of policing in regard to market abuse directives.”

– Regional insurer, Europe

“Computer-generated trading is here to stay but the skill set of the practitioners needs to grow along with the evolving market. I would argue that even at this stage, the tools are leaving the users behind. [There is a risk that] as more traders use algorithmic trading the fundamental role of the market place in financing the real economy is undermined.”

– Anonymous

“Price formation and discovery will become super-efficient but if every participant reacts to the same news release at the same time it magnifies the herd mentality.”

– Global asset manager

27. From your understanding, do you feel any potential market risks from AT/HFT are being adequately addressed by proposed regulation?

Opinions are divided as to whether proposed regulation adequately addresses the risks from computerised trading.

“Yes with MiFID II. Imposing risk controls around naked access along with rules that may dampen intraday volatility (circuit breakers, collars, etc.) is constructive. More work needs to be done to evaluate whether minimum resting order times or cancellation fees can improve the price formation process.”

– Regional asset manager, US

“Yes, many of the threats are recognised and are being addressed.”

– Global asset manager

“Yes but very slowly. The HFT community pays a lot of commissions and creates so-called liquidity so any for-profit exchange will be a supporter of HFT.”

– Regional asset manager, Europe

“Clearly issues have been identified and regulators have started to try and address them. In this process regulators must not lose sight of who ultimately benefits or loses out as a result of their actions. MiFID II will hopefully address the regulation of HFTs and algorithmic traders.”

– Global asset manager

“I think that regulators should consider if new regulations are required for AT/HFT, or if better enforcement of existing regulation, in particular market abuse directives, would foster greater trust in the market. If AT/HFT is too fast and too widespread (trading across different venues/geographies) to police, then proposals such as minimum resting times need to be introduced.”

– Regional insurer, Europe

“No. If anything the proposals play directly into the hands of the HFT firms by suggesting measures to bring volume out of dark pools onto lit exchanges.”

– Anonymous

“No. It seems regulators and policy makers are only now beginning to identify these market risks and there is little in the way of regulation being proposed to address these concerns.”

– Regional asset manager, Europe

“No.”

– Four respondents

“If anything I think they risk over-regulating an activity where competition and market forces are already impacting the business models.”

– Global asset manager

28. Do you think regulatory proposals (clearing and execution) will result in electronic trading strategies being deployed in OTC derivatives markets? Is this beneficial or does it pose future risks?

Most respondents believe that electronic trading will be deployed in OTC markets as clearing and execution are standardised. While some firms see this as a positive trend, others are concerned that this would mainly benefit investors employing quantitative strategies.

“Yes, anything that will have liquidity in a central limit order book environment will attract AT/HFT. As long as the risks of OTC are understood – and HFT are generally sophisticated investors.”

– Global asset manager

“Any proposals to make the OTC derivatives market more transparent would probably encourage the use of computerised models to replicate trading patterns. This would pose similar risks to what we are experiencing in equity markets although with the geared nature of these instruments the results could be even more unsettling for market stability.”

– Regional asset manager, Europe

“Yes inevitably. This will result in more transparency but will affect the risk prices brokers are willing to show, resulting in higher trading costs. It could also increase the risk of Flash Crash type events.”

– Anonymous

“The drive from OTC to listed markets will see an increase in single stock option liquidity. Algorithms and HFT will enter the market, as seen in the Futures markets.”

– Anonymous

“Ultimately all trading will be done electronically. Overall, the more systematic trading is the more people will try and find systematic ways to make money out of the process and not the underlying direction of the market. Certainly standardised clearing might be helpful from a market and industry standpoint but you have to be careful about standardising everything.”

– Regional asset manager, US

“Exchange based and electronic trading has [been more resilient] than OTC markets which have seen problems. We must end up with a more transparent market.”

– Global asset manager

“This could be a big improvement because the proposals address counterparty risk.”

– Regional asset manager, Europe

“Yes. CDS are already traded on some platforms and that is a huge market. [I do not want to] imagine the damage caused by computer trading in CDS or Interest Rate Swaps.”

– Regional asset manager, Europe

“We do not favour anything which enables [HFT] to occur at a higher rate. We have a [very long] duration and to us short-term trading is peripheral, irrelevant and makes it harder for fundamental views to come through.”

– Regional pension fund, Europe

“OTC markets are generally less liquid and most would not be best supported by an electronic order book. Most OTC instruments might be better served by the Request for Quotes model.”

– Regional insurer, Europe

“Inconsistent liquidity in OTC derivatives markets may make it difficult for complicated electronic trading strategies to be successfully deployed. Some strategies may be useful if carefully implemented but overall great care would have to be taken in using complicated strategies in what would be a new regime in its infancy.”

– Global asset manager

“Clearing does not mean much related to HFT. If it is bilateral, no one will trade against HFT guys, and if it is central then it is anonymous. Generally, we are ok with it.”

– Global multi-strategy hedge fund

“My initial reaction to moving more OTC stuff on to exchanges is that it opens the door for more HFT. It should make it easier for those guys.”

– Hedge fund trade organisation

“I think this movement will make HFT happen more easily. The regulator is endorsing exchange traded instruments, and we are not discouraging this strategy. There will be new arbitrage opportunities on exchange and OTC [instruments].”

– Global multi-strategy hedge fund

29. Which OTC instruments do you consider most likely to benefit from AT/HFT? Please explain why.

Many participants think that Credit Default Swaps (CDS) as well as standard equity and interest rate derivatives could be traded electronically.

“iTraxx index CDS and single name CDS included in the indices. Some interest rate swaps are also very standard products and will likely be traded quickly to reduce any market mispricing or deviations from listed products.”

– Regional asset manager, Europe

“Instruments that have a constant flow of supply and demand and where the execution venues are not too fragmented such as FX [could benefit]. An improvement in the price discovery process for instruments such as CDS and IRS would be welcome and trading activity of these instruments seems to be picking up. However there may not yet be sufficient liquidity and depth for these instruments to become the focus of HFT as the basis of this market is still a customised instrument. Given the lower liquidity, the market impact of HFT may be larger than in deeper markets so it would have to be controlled very tightly.”

– Global asset manager

“OTC markets tend to be illiquid and, therefore, not ideally [suited] to AT. The main exception is the CDS market which could support an electronic order book. We would look to minimise HFT interaction in these markets.”

– Regional insurer, Europe

“Equity options for liquidity reasons and price transparency.”

– Anonymous

“There is still no significant algorithmic trading in the Fixed Income markets. [Using an algorithm] is hard in an environment where there is not enough liquidity such as trading one specific bond.”

– Global insurer

“[Intuitively it seems to be] a good thing to standardise CDS but I am not sure whether this means CDS will be traded via algorithms.”

– Global asset manager

“Some OTC instruments are already traded electronically as HFT firms are finding it harder in their original market places and are looking for other venues. Listed futures seem likely to be traded electronically but I am not sure about CDS.”

– Global asset manager

“We are in the process [of trading] equity and interest rate derivatives electronically.”

– Regional insurer, Europe

“No asset class will benefit. The link between equities and derivatives (i.e. unwinding Delta) will increase costs to market participants in terms of Delta impact.”

– Anonymous

30. What lessons should be drawn from existing electronically traded markets in devising the microstructure for computerisation in OTC markets?

Respondents suggest focusing on creating transparent and less fragmented market structures.

“[The focus should be on] effective, transparent controls and procedures. Relatively tight price circuit breakers [should be implemented across] all trading venues and not just the primary exchange.”

– Regional asset manager, Europe

“The more complex an instrument becomes the greater are the chances of impact from unwanted market participants. New electronic markets will be subject to gaming attempts.”

– Anonymous

“The focus has to be on better regulation of the firms that have direct access to the execution venues (exchange members). They would have to be responsible for any computer-driven strategies within a clearly defined environment set by the respective regulators.”

– Global asset manager

“Put more responsibility on the buy–side firms which provide natural liquidity.”

– Global asset manager

“OTC markets are illiquid and fragmentation would make it harder to trade in these markets.”

– Regional insurer, Europe

“Fragmentation poses serious logistic problems.”

– Regional asset manager, Europe

31. Do you have concerns with the current evolution of supporting market structure for trading and electronic trading? Please elaborate.

Respondents express various concerns including market fragmentation and that the post-trade infrastructure has not evolved as quickly as pre-trade processes.

“[The current market structure is] too fragmented and buy-side firms do not know where stocks are trading.”

– Regional asset manager, US

“We do not generally favour more regulation but it appears that the US market is too fragmented and that consolidation is likely. If only a couple of venues have 20% market share and a large number of venues have very little market share the structure is not right. An exchange oligopoly was not right either but there should be a middle way.”

– Regional asset manager, US

“Major market structure improvements have been reactionary. There has to be a much better understanding of the way access is allowed and which strategies could negatively affect market volatility and costs to investors. Exchange membership could also be reviewed to allow trading to take place without having to reveal information to third parties. Market fragmentation makes it increasingly difficult to find the true equilibrium prices.”

– Global asset manager

“There is a fine line between using technology to improve one’s efficiency and using it for manipulative strategies. We are concerned that authorities are not being bold enough to identify where this line should be drawn and that the advance of technology will eventually overrule [...] the morally correct behaviour for trading in markets. In the current market structure, HFT firms are always at an advantage in generating alpha compared to long-only investors.”

– Regional asset manager, Europe

“[Our concern is] managing potential conflicts of interest inherent in the for-profit exchange model and for broker internalisation. We would also like to create incentives (or eliminate disincentives) to increase displayed liquidity.”

– Regional asset manager, US

“Yes but some of the proposals in MiFID II such as a consolidated post-trade tape with clearer flags give some optimism that improvements are at hand. We do have some concerns over proposals to enforce same-day reporting of all OTC trades, irrespective of size, since this will make risk prices explode and remove another option for the trading of block sizes.”

– Anonymous

“We have two concerns. The first is that institutional shareholders are treated exactly the same as retail investors which is the reason that average trade sizes have completely dissolved and block trades disappeared. The second concern is that as electronic trading has prospered the supporting trade data structure and reporting is not as advanced post-trade as it has developed pre-trade.”

– Global asset manager

“MiFID truly created a more competitive environment but it may have made it too easy to open new venues and destroy the cost structure of established venues. We think that broker commissions have not decreased as much as brokers’ costs. From here it seems unlikely that there will be much further growth in mutual trading facilities but technologies such as smart order routing will become more important to capture all available liquidity.”

– Global insurer

“We welcome the move to central counterparty clearing.”

– Regional insurer, Europe

“We do not have concerns so long as traders are unable to deliberately overwhelm the market with thousands of cancellation requests to benefit from latency advantages.”

– Regional asset manager, Europe

“I do not think you would get less comfortable in the new clearing environment. If I was a clearer, I would be careful about who I let HFT on my book. Obviously clearers need to make sure they are margined for gap risk. We have never really delved into the structure of HFT with clearers, but I think the banks margin appropriately for that.”

– Global multi-strategy hedge fund

32. What steps would you like to see policy makers take to ensure market structure evolves to the benefit of efficiency and stability going forward?

Respondents want authorities to increase confidence in markets by improving data availability and ensuring that markets are fair to all participants.

“We would like to see steps to return confidence in the integrity of capital markets. [...] Regulations on computerised trading, [limiting] short-term speculation which does not benefit society, would be very welcome.”

– Regional asset manager, Europe

“Place strict rules around predatory trading strategies and put a clear structure in place to ensure proper accountability for trading in any public market. Clearly define all trading venues and the type of investors/strategies that are/are not allowed to engage with them.”

– Global asset manager

“Sufficient safeguards must be in place to regulate an evolving market. Regulation needs to evolve at a quicker pace than it has recently or it becomes limited in its scope, creating opportunities for market abuse.”

– Global asset manager

“A market should be fair. Participants should not be allowed to pay for receiving data ahead of others [as is the implication of] server co-location.”

– Anonymous

“Ideally we would want to return to a central limit order book and at the very least have a consolidated tape [as is proposed] by MiFID II.”

– Regional asset manager, Europe

“[We would welcome a] consolidated order book.”

– Regional asset manager, US

“Crossing networks between buy-side firms have seen a pick-up in activity recently, which should give an indication of how concerned the buy-side is about the state of the lit

markets. However buy-side networks can be quite directional when all buy-side firms are trying to do the same thing so it would be better to repair traditional markets.”

– Global asset manager

“Crossing networks worked very well in matching large trades between institutional investors. Now that sell-side firms are also accessing these venues the concept is losing market share.”

– Regional asset manager, Europe

“Authorities need to better understand that exchanges are conflicted in their advice and should consider processes which allow retail and institutional investors to help shape market structure.”

– Regional insurer, Europe

33. What do you see as the most important elements of regulation to be prioritised with respect to electronically traded markets?

Traditional investors agree that creating a level playing field and increasing efforts to prevent market manipulation should be prioritised.

“The key principle that should govern all markets is a level playing field in which HFT firms are not able to gain unfair advantages. There should be a set of rules to stop abusive activities.”

– National asset manager, UK

“The most important element is the ability to monitor activity in real-time, reconstruct specific trade activities and process transaction reporting data to identify market abuse.”

– Global asset manager

“Regulation should ensure markets are efficient, fair, orderly and transparent. Structures that allow some participants to gain an advantage over others are very clearly contrary to the notion of fairness. Co-location is theoretically available to all, but is uneconomic for many investors and would only be necessary to eliminate the disadvantage they are put at by its existence. HFT is not really regulated and that loophole should be closed.”

– Anonymous

“The governance structure of market providers is inadequate and should be more regulated. The priority in restoring public confidence in capital markets must be to address (and ban) any electronic trading that adds additional volatility or promotes the opportunity for speculators to manipulate the genuine trading activities of retail and institutional investors.”

– Regional asset manager, Europe

“Electronic trading must become regulated. Regulators do not have sufficient understanding or resources to properly police the AT/HFT boom.”

– Global asset manager

“Priorities should be post-trade transparency, broker internalisation and preventing increasing messaging traffic from impacting the trading infrastructure.”

– Regional asset manager, US

“Currently we can only see where an order has been executed but not to which venues an order has been shown to. This information should be shared back to the price maker.”

– Global asset manager

“[Authorities’ focus should be] pre and post-trade data consolidation, low-cost market access and incentives offered by exchanges. The priority should be to make markets transparent for traditional investors and prevent them from being abused by HFT firms.”

– Global asset manager

“The most important issues are the consolidated tape and a classification of dark pools, trading venues and market participants.”

– Anonymous**34. Do you have concerns with regard to the current regulatory processes underway?**

Responses broadly fall into three categories. One is that buy-side firms are less engaged in shaping regulation than exchanges and brokers. The second concern is that regulation could limit opportunities for trading in dark venues. Finally, participants are uncertain how authorities will balance the need for quick regulation with a thorough investigation of its impacts.

“Transparency, whilst being a desirable and understandable objective, can be counterproductive for some order types. The market needs to have the flexibility to transact all shapes and sizes of business in different ways, rather than prescribing transparency as a panacea.”

– Global asset manager

“Our biggest concern is potential dark pool regulation. Although we agree that some broker internalisation of small retail order flow may detract from price formation, we do believe there is a real benefit for the institutional investor in negotiating and trading large blocks off exchange. It minimises information leakage and adverse price impacts.”

– Regional asset manager, US

“There is a huge amount of lobbying from market participants, primarily from brokers and exchanges. Involvement of buy-side firms is more limited and perhaps regulation is not sufficiently driven by the end users.”

– Global insurer

“Yes. There has been effective lobbying by the exchanges to move trading from dark venues back on to exchanges. Dark venues often represent the institutional investor’s best opportunity to move share blocks with limited market impact. Our concern is that politics rather than practicalities are driving much of European regulatory change. We would prefer more effective post-trade reporting.”

– Anonymous

“Yes. There is too much government protection for local exchanges as evidenced from none of the exchange mergers being approved or finalised.”

– Regional asset manager, Europe

“The indications are that the most important issues are being addressed. The only concern is whether there is a full understanding of the issues so that there will not be unintended consequences. We generally favour a more focussed approach to address specific strategies.”

– Global asset manager

“Our perception is that current regulatory processes are taking too long. That said, however, the required pace of regulatory change poses a risk of solutions being developed which have not been subject to adequate consultation, impact or cost-benefit analysis.”

– Regional asset manager, Europe

“[We are concerned that] the regulatory push is based on poor information, misinformation, or political bias. We believe that leads to bad regulation. We want regulation to be based on comprehensive understanding and a clear articulation as to what risk the regulator is looking to protect against.”

– Global multi-strategy hedge fund

“There is a big concern [about] the cost effects of looming regulations. We are afraid of increased trading costs and a loss of liquidity. We would certainly trade less in Europe if the regulations were handed down there and we would move assets.”

– Global multi-strategy hedge fund

“[...] I do not think everyone fully understands the difference between DMA and HFT. Not even everyone here knows what the difference is. For us, DMA is an electronic execution mechanism. If I am a HFT firm and I just need to access to market, then you have a different concept. The two things should be looked at separately.”

– Multi-strategy hedge fund, Europe

“I would argue [there is] no need for regulation at all. It imposes a huge cost that will ultimately be borne by someone who does not have the risk management.”

– Multi-strategy hedge fund, US

