August 2011

IOSCO Consultation Report on Regulatory Issues Raised by the Impact of Technological changes on Market Integrity and Efficiency

Comments from NASDAQ OMX

The NASDAQ OMX Group, Inc. delivers trading, exchange technology and public company services across six continents, with more than 3,600 listed companies. NASDAQ OMX offers multiple capital raising solutions to companies around the globe, including its U.S. listings market, NASDAQ OMX Nordic, NASDAQ OMX Baltic, NASDAQ OMX First North, and the U.S. 144A sector. The company offers trading across multiple asset classes including equities, derivatives, debt, commodities, structured products and exchange-traded funds. NASDAQ OMX technology supports the operations of over 70 exchanges, clearing organizations and central securities depositories in more than 50 countries. NASDAQ OMX Nordic and NASDAQ OMX Baltic are not legal entities but describe the common offering from NASDAQ OMX exchanges in Helsinki, Copenhagen, Stockholm, Iceland, Tallinn, Riga, and Vilnius.

NASDAQ OMX welcomes the opportunity to comment on the Consultative report on Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency.

NASDAQ OMX provides comments from the perspective of operator of securities exchanges in multiple jurisdictions in the US and Europe as well as provider of technology to exchanges worldwide.

General comments

Regulation must evolve with market structure and technology. No matter how the broader transparency debate is resolved, there should be no doubt that transparency to regulators underpins fair markets. NASDAQ OMX has made and continues to make significant investments in regulatory technology and the training of regulatory staff to maintain the fairness of its rapidly evolving and highly automated markets. In this evolving market environment we should consider having better coordinated regulation across markets through a consolidated audit trail that provides full transparency into the conduct of each market participant. In addition, better coordination by regulators is essential to ensure effective cross-market surveillance.

NASDAQ OMX has continually harnessed the power of technology, transparency and competition to become the leading exchange operator, delivering exchange technology and public company services across six continents. NASDAQ OMX developed and honed these core principles over its 40-year transformation from an opaque segment of the over-the-counter market to global prominence as the largest exchange operator on the planet. NASDAQ pioneered the competing-dealer market model and became the first electronic market and the first market to use technology to organize dispersed quotations. Through the 1980s and 1990s, NASDAQ added real-time trade reporting for both domestic and foreign stocks, real-time dissemination of trade reports, and real-time dissemination of regulatory information. NASDAQ continued to leverage technology, developing new order routing and negotiation systems that led to later automated execution systems. In 2008, NASDAQ capped a transformative decade by acquiring Sweden's OMX Group to become the world's largest exchange company, NASDAQ OMX. Today, NASDAQ OMX is a technology provider to 70 exchanges, 8 regulators and 50 international brokerage clients around the world through our trading technology and SMARTS regulatory surveillance systems.

NASDAQ OMX does not share the skepticism expressed by some towards the automation and acceleration of trading practices. Healthy markets have always harnessed the power of rapid communication to drive trading efficiency, increase transparency, and bolster liquidity. On a superficial level, speed does offer trading advantages to those that possess it. The important policy question, though, is whether the availability of those advantages is fair and beneficial or not. In NASDAQ OMX's view, speed *in and of itself* is neither inherently fair nor unfair.

A more appropriate goal of regulation is to ensure equality of availability and fair access. Some traders will invest in algorithms; others invest elsewhere for their own legitimate reasons. NASDAQ OMX fully supports regulators' efforts to eliminate artificial barriers that favor one participant or set of participants over another by, for example, making co-location or proprietary data available only to select members.

Another manifestation of speed about which some are skeptical is High Frequency Trading (HFT). It is important to understand that the term HFT is not clearly defined and is used to describe numerous different trading strategies and practices. To NASDAQ OMX, HFT is best understood as the use of high speed automated trading technology to generate and route orders according to computer algorithms. As a practice, HFT is employed by both specialized boutiques and within larger financial services firms, as well as by proprietary traders and on behalf of institutions. NASDAQ believes that HFT, as described above, benefits the market by adding liquidity and contributing to narrower spreads. Speed is not inherently unfair or harmful, it is the misuse, misapplication of speed or the lack of appropriate risk controls that may harm investors or markets. As stated above, regulation and surveillance must keep pace with technology. NASDAQ OMX believes that regulators can continue to evolve to meet any challenge posed by HFT.

Requirements for market surveillance for all types of organized trading should be on the same level, ensuring the same quality of market surveillance irrespective of where the trading of an instrument takes place. Where practicable, we believe this should be accomplished through uniform standards and access to comprehensive trading information in a format agreed among trading venues or required by government regulators to facilitate cross-market regulation.

Answers to specific questions of relevance to NASDAQ OMX as an operator of exchanges

Q1 What impact have the technological developments in the markets in recent years had on your own trading? Has it encouraged, discouraged or had no impact on your willingness to participate on the lit markets, and how does this differ between asset classes and/or instruments?

While NASDAQ OMX does not engage in its own trading, we have seen dramatic swings in the willingness of U.S. market participants to trade on lit markets as trading technology has evolved. At the end of the U.S. manual market era, circa 2001, there was more trading on lit markets than today. Admittedly, a lit market in 2001 was less transparent than a lit market in 2011. The rapid migration of trading technology to lit electronic limit order books through the mid-2000s led to an increase in the proportion of trading that was lit in the U.S. through 2006-2007, as the technology available for dark trading lagged behind that of the lit markets. Since 2009, however, lit trading has been steadily declining as a percentage of overall volume, from 80% in early 2009 to less than 70% today. While technology is unlikely to be the only cause of the increase in dark volume over the past two years, it is likely that the declining cost of trading systems, including trading algorithms, routers, and matching engines, has contributed to the decrease in participation on lit markets.

Q2 What are your views on the suggestion that proprietary trading firms (including HFT firms) that are not currently subject to registration/authorisation by a regulator should be required to obtain such a registration/authorisation? Are there specific regulatory requirements you believe such firms should face? To what extent do your answers differ if the proprietary trading firm accesses the market as the customer of an intermediary firm through DEA (i.e. under that intermediary's trading rules/codes) rather than as a direct member of the market itself?

We support adequate supervision of all market participants. NASDAQ OMX has been a leader in attempting to rationalize the surveillance and regulation of sponsored access.

At a minimum, regulators' supervision should include requiring that each sponsored participant enter the market using a unique market participant identifier or mnemonic that enables regulators to more quickly link the firm with its trading activity. Also, when investment firms sponsoring HFT firms implement adequate risk control procedures, regulators must supervise that these risk control processes are adequate. Licensing HFT firms directly would facilitate regulators' supervision of the HFTs' pre-trade risk controls.

Trading venues may determine that sponsorees should sign contracts with them to ensure that the venue has privity of contract and jurisdiction over the sponsoree. In any event, it should always be clear that the sponsoring firm remains liable for the activity of any firm it sponsors into a trading venue.

Q3 What recommendations, if any, would you propose to strengthen the regulatory requirements around pre- and post-trade risk controls? In particular, what measures, if any, do you think regulators should introduce that relate specifically to the use of and risks posed by algorithmic trading and/or HFT?

We believe that pre-trade risk controls are an important safeguard that should be required of all market participants and should certainly be a precondition to allow firms to sponsor other traders into

a market. The U.S Securities and Exchange Commission (the ”SEC”) recently took important steps to strengthen risk control requirements for trading activity in the United States (”Market Access Rule”). Compliance with the regulatory and risk management provisions of the Market Access Rule took effect July 14, 2011 for equities, options, exchange traded funds and security based swaps. The rule for fixed income securities will become effective on November 30, 2011, as will the credit control provisions for all of these asset classes. The rule applies to all broker dealers with market access and requires risk management controls and supervisory procedures that are designed to ensure that customers’ transactions are within credit and capital thresholds, orders are not erroneous, orders do not violate applicable regulatory requirements and risk management controls are under the “direct and exclusive control” of the broker-dealer.

Our experience is that systemic risks such as bad trades or technology failures are not unique to HFT firms and, therefore, HFT should not be regulated in isolation. However, where the HFT model may expose or magnify certain risks, HFT firms, their sponsors and trading venues must factor this into their controls and regulations. For example, in a jurisdiction where a firm is required to have reasonable policies and procedures in place to prevent erroneous trades, an HFT firm might be deficient if its procedures failed to require reasonable testing of algorithms before launch. However, we disagree with commenters who recommend that exchanges or government regulators be required to review and approve algorithms before use. Such regulators are unlikely to have the expertise to adequately perform such a function.

Q4 To what extent do you believe the use of trading control mechanisms such as circuit breakers and limit-up/limit-down systems by trading venues should be mandated? If you believe they should be mandated, should venue operators be permitted to design their own controls or should they be harmonised/coordinated across venues (including between interrelated instruments such as a derivative and its underlying)?

NASDAQ OMX supports the use of carefully designed tools that lessen the risk that system problems, trading errors and market confusion decouple trading prices from the intrinsic value of securities thereby triggering “flash crash” events. Where practicable, we believe limit up/limit down mechanisms, which for some period of time limit trading to a band without halting the market, are less disruptive than circuit breakers that immediately halt the market for a period of time. Since trading controls of any type must operate in real time, using multiple limit up/limit down thresholds or a limit up/limit down mechanism in combination with circuit breakers may be optimal for providing controls which can handle both minor and major disruptions in liquidity. Similarly, we believe it is important for regulators to periodically review risk controls and adjust parameters as needed.

There is a compelling case for mandating cooperation among trading venues as regards volatility guards and other circuit breakers to avoid confusing and conflicting controls. We believe that exchanges or government regulators should implement uniform rules across all trading venues and instruments. Where one market must monitor the process and trigger trading pauses or halts, the ‘home or listing market’ is usually best suited to this task. Similarly, if uniform standards are not possible, we believe the home market should be tasked with calibrating the parameters of such risk controls, with secondary markets obligated to follow the lead of the primary market and apply the same calibration in their guards and circuit breakers. The cost of creating and operating trading controls is covered by the listing fees paid to the home market.

Risk controls such as circuit breakers are useful and have been applied in several forms in our various markets. Our Nordic markets employ a functionality called static volatility guard in order to moderate large sudden volatility spikes in individual securities. It is important to note that such volatility can result from many causes such as material news, market rumors, technology glitches or trading errors that are not confined to HFT. The static volatility guard operating in the Nordic markets uses the previous trading day's closing price as a reference price and is designed to prevent the price moving more than a specified percentage (calculated per instrument) away from the reference price. If the price reaches/exceeds the reference price trading is halted for three minutes while an intraday auction takes place. NASDAQ OMX's Nordic markets also operate a dynamic volatility guard to ensure that a single order does not move the stock more than a specified percentage (also calculated per instrument) away from the price of the last execution. If this guard triggers, a one minute intraday auction takes place.

In the United States, the SEC has worked with the exchanges to develop coordinated circuit breaker rules. In the wake of the events of the May 6, 2010 flash crash, markets introduced a new market-wide single stock circuit breaker functionality that currently applies to securities in the S&P 500 and Russell 1000 and to certain exchange traded products, primarily exchange-traded funds. On August 8, 2011, single stock circuit breakers will be extended to all other securities covered by the national market system for consolidation and dissemination of transaction information.

On April 5, 2011, U.S. exchanges and the Financial Industry Regulatory Authority ("FINRA") filed a proposal to establish a new "limit up-limit down" mechanism to address extraordinary market volatility in U.S. equity markets. Under the proposal, the mechanism would prevent trades in listed equity securities from occurring outside of a specified price band, which would be set at a percentage level above and below the average price of the security over the immediately preceding five-minute period. To accommodate more fundamental price moves, there would be a five-minute trading pause – similar to the pause triggered by the current single stock circuit breakers – if trading is unable to occur within the price band for more than 15 seconds. It is expected that the limit up-limit down mechanism will replace single stock circuit breakers.

In addition, the SEC and the exchanges are in discussions to update the market-wide circuit breakers that have not been significantly modified since 1998. Changes would likely include transitioning to a broader-based index as the reference measure, reducing the duration of halts in all but the most extreme drops and lowering the percentage movements that trigger halts. Currently, the first market-wide halt does not occur until the Dow Jones Industrials Average drops 1200 points (10%). When introduced in 1987, a 350-point drop triggered the first halt.

Q5 To what extent do you believe market maker schemes offered by trading venues should be subject to mandatory minimum criteria? Should the criteria be determined by the trading venue alone? To what extent do you agree with the suggestion that the use of stub quotes should be prohibited?

The criteria should be determined by the trading venues. The minimum criteria may need to be modeled according to local practices and needs and may vary over time. The trading venues have sufficient incentives to maintain stable and efficient markets, supported by appropriate rules and close oversight of markets.

In Europe, market makers are already subject to certain legislation in the Market in Financial Instruments Directive (MiFID).

A comment specifically regarding the US markets. NASDAQ OMX is concerned that the current quotation regime creates artificially wide public reference prices for some low-priced and liquid securities. The current requirements established by the SEC do not permit quoting in increments less than one cent in quotations priced at or above $1.00 and permits quoting in increments as small as $0.0001 for quotes priced below $1.00. We believe this is driving some price discovery into non-transparent “dark” markets. Simultaneously it contributes to excessive, inefficient quoting in some higher-priced securities. Investors would benefit from a more intelligent tick size regime.

Minimum quotation increments matter. Setting minimum quotation increments too large, even at one cent, can harm price discovery. If the minimum increment is too wide, investors may be willing to buy and sell securities at prices between a one-penny spread but lack the ability to display that willingness to the market. Today, investors can only express a willingness to trade between one-penny spreads by using non-displayed orders priced at the half-penny midpoint in certain exchange and non-exchange trading systems, and by offering price improvement in non-exchange trading systems. Setting minimum quotation increments too small can also harm price discovery. If the minimum increment is too small, investors hoping to set the best bid or offer could enter orders that improve prices by an amount that is economically insignificant relative to the price of the security and aggregate value of a given trade. As a result, quotations may change rapidly and, in the absence of actual executions, potentially may be wasteful. Quotes that change too rapidly and prices that move for insignificant amounts reduce the incentives to post limit orders. Where the quotation increment is too small or too large, price discovery is impaired.

In the wake of the flash crash, the SEC and U.S. markets examined the impact of stub quoting on the price decline. The SEC approved new rules proposed by the exchanges and FINRA to strengthen the minimum quoting standards for market makers and effectively prohibit "stub quotes" in the U.S. equity markets. The new rules require market makers in exchange-listed equities to maintain continuous two-sided quotations during regular market hours that are within a certain percentage band of the national best bid and offer (the best price across U.S. markets in a security).

As with other issues, we believe that whatever standard is adopted should apply across all trading venues, whether exchange, alternative trading system, multilateral trading facility or any other comparable type of execution venue. Trading venues that offer the same or similar trading services should compete on a level playing field. In case one type of trading is targeted with more restrictive conditions, the level playing field is broken. Trading is then likely to move to other venues. It is important to defend the transparent trading venues; otherwise the risk is that trading moves away from the lit venues and the proportion of dark trading increases even further.

The above argument also point at the challenge of maintaining a balance between the efficiency and innovation benefits of competition on the one hand, against the regulatory and fairness benefits of standardization on the other hand. Operators of all types of venues must have the ability to innovate, to deliver ever increasing efficiency to the market. At the same time, market participants need to have continued trust in the markets. The regulatory safeguards, surveillance and the supervisory oversight need to support this.

Q6 Do you have suggestions for improvements to regulators' surveillance capabilities with respect to the markets and modern trading techniques? Please elaborate. Who should bear the cost of investing in such capabilities and the cost of operating and supervising the markets in order to ensure fairness among market participants? Please elaborate.

In general, as trading activities are increasingly fragmented across markets, the need for cooperation among regulators is becoming increasingly important when it comes to market surveillance. Such cooperation is crucial in order to ensure market integrity. Regulators' surveillance capabilities need to be state-of-the-art and need to facilitate cooperation among regulators. Investment in flexible systems that can be continually updated/adapted to changing market behaviours and regulations is necessary. As we see it, the measures to address surveillance of fragmented markets today are not providing the sufficient safeguards. Authorities seem to not have the sufficient tools or resources to analyse all the data. Depending on the characteristics of markets, the degree of interlinkage between markets, geographically and otherwise, several solutions of how to best achieve the necessary overall view and cooperation can be envisaged.

One example of a market where the regulator has taken the initiative and introduced rules that give the supervisor powers is the Australian market, which is currently preparing for increased competition with the arrival of Chi-X. The Australian Securities and Investment Commission (ASIC) has used the application of existing technology to enable it to open up the Australian market to competition, while putting in place the appropriate safeguards first. Once Chi-X goes live in Australia, ASIC will have real-time consolidated oversight of trading on both Chi-X and the ASX.

We believe that the best form of regulation involves a cooperative partnership between trading venues, government regulators and compliance officers at the trading firms. While government regulators have a valuable role in monitoring markets, not least because they have the enforcement powers and they are able to take an overall view of the market, the markets themselves often have the best knowledge of the functioning of the markets they operate and the local trading practices. Compliance officers strengthen the cooperation by self reporting violations of trading rules directly to the trading venues or regulators, but they need appropriate technology to identify these breaches in the first place. Regulators' surveillance capabilities need to be state-of-the-art so that they can analyse and make sense of vast amounts of data, and they must enable sharing of information to facilitate cooperation among regulators. This includes investment in surveillance technology that can easily be updated/adapted as regulations and market characteristics evolve. We do believe that trading venues can successfully perform cross-market surveillance if they have access to an audit trail of market data. Trading venues do not, however, have the same arsenal of enforcement tools or broad jurisdiction to enforce securities laws available to government regulators. For this reason, the regulatory programs of trading venues and government regulators must complement each other. An alternative approach to ASIC's was taken by Canada where the SRO, the Investment Industry Regulatory Organization of Canada (IIROC) has the responsibility to set up and enforce high quality regulatory and investment industry standards. IIROC has successfully implemented tools that provide real-time consolidated surveillance capabilities in a fragmented market, processing hundreds of millions of trading messages per day, while having independence from the trading venues that it is required to investigate, whilst also having the ability to take action against participants that breach trading rules and laws.

NASDAQ OMX shares the concern of commentators who question whether more needs to be done to ensure that there is a level playing field among the regulatory programs of trading venues. Unequal regulation can lead to regulatory arbitrage and a race to the bottom. Government regulators may need

to consider whether minimum standards are necessary for regulatory programs. Similarly, serious consideration needs to be given to how to equitably apportion the cost of good regulation so that traders do not bypass well regulated markets as a way to save money. Allocation of costs might include regulatory fees assessed based on total trading activity rather than solely activity on a specific market. This would allow exchanges to recoup more of the actual cost of performing cross-market surveillance, which often entails review of trading that occurs on other markets. Several U.S. options exchanges have adopted this model for a cross-market "options regulatory fee." Alternatively, in jurisdictions where firms belong to an industry group, such as FINRA in the U.S., that organization could bill members directly for regulatory costs which are then either used by that entity for surveillance purposes or transferred to the entities that are responsible for surveillance. This approach is however only viable where all firms trading the relevant security are members of the entity responsible for financing the costs of surveillance.

It is true, as is stated on page 12 in the Report, that US markets show a strong degree of inter-linkage and that for instance European markets may not show the same degree of interconnectedness. However, it is our firm belief that European markets are also to a significant degree interconnected. The MiFID legislation that came into force in 2007, introduced competition between trading venues across Europe, by the introduction of MTFs as is referred to on page 13 in the Report, which has resulted in market fragmentation. This development, and the technological development in focus in the Report, indeed calls for a regulatory approach that ensures an overall monitoring of the markets in Europe as well.

We attach as Annex 1, a letter sent to the European Securities and Markets Authority (ESMA)[1], where we propose, for the European markets, that the 'home market' should be required to take the primary responsibility for surveillance of a specific instruments, while the 'secondary markets' should be required to cooperate. The primary market should have responsibility for establishing surveillance parameters, risk controls, trading suspensions; the secondary markets should be obliged to follow these decisions. For instance, trading venues would need to ensure access to each others' order books. Today, such sharing of information is legally impossible due to confidentiality provisions in MiFID. Regulatory measures to implement any of these options will need agreements on exchange of trading information and confidentiality. This would require adaptation of the MiFID legislation.

We also wish to highlight that it is very important to address this question in the context of the broader market participants, beyond market operators. Clearly, it is essential that regulators have access to technology that provides them with the ability to monitor markets across multiple venues and asset classes. If regulators have this same view of the trading world, then we believe that the broker-dealers and those responsible for compliance and risk management at these firms should also have the same view. Therefore, the broker dealer community should play its part in implementing proper cross-market compliance technology. This is a point that seems to be overlooked in this Consultation Report and it needs more attention from regulators. The fact that large portions of trades are executed by broker dealer platforms underlines the need to increase the regulatory focus on surveillance in the context of the broader market participants, beyond exchanges and such trading venues. The same reasoning is valid for any compliance function related to trading in financial instruments, also for SROs, where applicable.

[1] At the time of sending the letter, Committee of European Securities Regulators, CESR.

Lastly, in order for supervisors' trading surveillance to be as robust and efficient as is needed, it must be based on correct and complete data that can be consolidated, as referred to on page 13 of the Report. A lot more attention should be given to the completeness and quality of data and the system for reporting of such data. The Transaction Reporting system (TRS) introduced in Europe by MiFID, seems to not have resulted in the intended benefits as regards oversight of fragmented markets. A precondition for improvements seems to be improvement on the quality and comparability of the data that the supervisors' surveillance is based on.

Q7 What do you perceive as the major causes of settlement indiscipline and settlement failures? What steps, if any, do you believe regulators should take to address these causes?

Timely delivery is crucial and settlement discipline should remain on a high level. Many trading venues as well as post-trading infrastructures have various procedures in place to incentives timely delivery (late delivery fee, buy-in procedures, etc.). We do not observe alarming levels of settlement indiscipline and we believe regulatory intervention is not motivated.

Q8 Have the appropriate steps been taken to limit or manage conflicts of interest that arise where an investment firm simultaneously conducts client-serving activities and proprietary trading or a trading participant is also a shareholder in a venue on which it trades? If you believe conflicts management is inadequate, please explain how this manifests itself and any recommendation you have for how conflicts management could be improved.

We recognize the challenge for supervisors to check the management of conflicts of interests. In some cases further legislation may be necessary, particularly with respect to conflicts of interest involving ownership of trading venues. In other circumstances involving internal firm trading practices, enhancements to the ability of regulators to examine and monitor existing law might be more productive than new legislation. Further analysis in this area might be warranted.

There are reasons to be concerned about whether conflicts with respect to ownership of trading venues are being managed effectively. A number of equity and option exchanges have sold stakes in their exchanges to market participants in exchange for order flow and executions from those participants. This raises concerns that there might be a conflict of interest between these market participants routing decisions and the best interests of their customers. This also raises concerns whether trading venues offering ownership stakes are meeting their obligations for transparent pricing and for treating similarly situated participants in a fair and equitable manner.

Many of these market participants have also set up dark pools which take liquidity away from the transparent or "lit" market and hurt price discovery. Combine this with the practice of internalization and not only is price discovery possibly negatively impacted, but the toxicity of the flow that does reach the lit market is increased. These dark venues free-ride the displayed quote but reduce transparency and efficiency across the broader market. These venues pose similar questions about conflicts of interests for the market participants who operate them. This raises similar concerns about conflicts of interests in the handling of customer orders. There have been several recent announcements in the U.S. of new dark pools specifically designed to match the order flow of small investors with sophisticated investors.

Another example of conflicts of interests observed in Europe, concerns the regulatory trade halts in the fragmented trading environment. There have been cases where the 'home market' has halted the

trading in instrument, but 'secondary markets' have not ensured a routine to follow this halt, although required to do so. There are also different interpretations of what constitutes a regulatory trade halt. Most markets are indeed willing to halt trading when necessary, but such willingness will deteriorate faced with the risk that trading in such situations moves away to other venues. Please also see our comments regarding cooperation between trading venues under Q 6.

Q9 Do you think existing laws and rules on market abuse and disorderly trading cover computer generated orders and are relevant in today's market environment?

Yes. In general, the statutory framework seems sufficient to identify and sanction abusive activity, although rules and regulations may need further clarification as new cases and strategies arise. In many cases involving HFT we see variations of longstanding manipulations such as layering, spoofing and wash selling rather than new forms of misconduct. Through case law or rules, regulators have in the past, and will further clarify standards and thresholds that separate normal activity from potentially abusive or disruptive practices. The regulators that we are familiar with have the discretion to calibrate sanctions to reflect the severity of an event. For example, NASDAQ OMX would be able to levy a significant fine on a firm with repeated technology failures or an algorithmic programming error that had systemic impact on the market. Regulators who lack such authority would be handicapped in policing today's markets. It is also important to ensure that necessary resources are devoted to market surveillance and that all trading venues and government regulators have access to consolidated audit trail data so that they can properly monitor the entire market.

Q10 Are there any strategies employed by HFT firms that raise particular concerns? If so, how would you recommend that regulators address them?

As the IOSCO consultation report states, many HFT strategies provide important liquidity to the market. Aspects of HFT—such as large message volume— require that trading venues, market data providers and other market participants have sufficient capacity to handle market activity and avoid latency. Similarly, risk controls are important to avoid systemic problems (although this problem is not confined to HFT). As noted in response to Q 9, many of the HFT-related manipulations we have identified are variations of existing misconduct that regulators should have the capacity to identify if they have access to comprehensive trading information. One area of focus for regulators should be on enhanced quoting surveillance, as high quotation to execution ratios is a hallmark of many current trading strategies. NASDAQ OMX has implemented a number of new surveillance alerts focused on quoting activity in order to address this concern.

Furthermore, many of the algo strategies used by the HTF are addressing multiple trading venues, trading the same share. If the particular share is traded on multiple venues the algos and HTF strategies are sometimes looking for mispricing between the venues and therefore we stress the importance of cooperation between venues and the implementation of the home market principles for the main market just to avoid any unnecessary delays in action needed if something goes wrong. This again illustrates our comments regarding surveillance cooperation as already mentioned above under Q 6.

Q11 Should charges or fees be imposed on messages, cancellations or high order-to-trade ratios? If so, how should the fees or charges be determined and on what basis?

We believe that markets evolve and that automation and speed or high volume strategies are not inherently bad if proper surveillance is conducted to prevent their misuse. While exchanges should have the ability to recoup their costs to operate and regulate their markets, fees designed specifically to deter strategies often used as part of market making and other liquidity-enhancing strategies could be counterproductive for market quality. Similarly, imposing arbitrary minimum time periods for orders to "rest" on the order book can be harmful for the market as it may discourage these traders from posting liquidity. The same goes for introducing an order-to-trade ratio. Beyond HFT, market makers and other participants using automated trading arrangements could also be harmed. While fees to deter liquidity-providing strategies can be counterproductive, some markets operators (such as NASDAQ OMX in the Nordic markets) have succeeded in encouraging such strategies through targeted price incentives in order to maintain the best balance functioning of the market. This success suggests that more draconian regulatory intervention may not be necessary. However, there should be sufficient surveillance in place to identify and correct specific abuses of not having minimum order durations - e.g. quote stuffing. See also our comment above under Q 10 regarding enhanced quoting surveillance.

Q12 Should market operators be required to make their co-location services available on a fair and non-discriminatory basis?

Yes, co-location facilities need to be offered on a non-discriminatory basis to ensure fair and equal access to the market.

Q13 Should market operators be required to provide testing environments to enable participants in stress test their algorithms? If so, what kind of minimum requirements are reasonable?

There should probably be some kind of minimum requirements on the algorithms. Market operators could provide some testing possibilities. However, in order to stress test the algorithms, it would be necessary to create a testing environment that combines exchanges, MTFs, ATSs, etc. Such a testing environment cannot be provided by each individual market operator. This, again, illustrates the importance of cooperation regarding surveillance, both among trading venues and also between market operators, market participants and supervisors.

Q14 To what extent do you have other comments related to the risks to market integrity and efficiency raised by the issues in this report?

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