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Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency

Dear Mr. Bijkerk,

CFA Institute is pleased to comment on the International Organization of Securities Commissions (IOSCO) consultation report on Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency (the "Consultation").

CFA Institute represents the interests of investors and investment professionals to standard setters, regulatory authorities, and legislative bodies worldwide on issues that affect the practice of financial analysis and investment management and on the efficiency and integrity of global financial markets. CFA Institute promotes fair, open, and transparent capital markets, and advocates for investors' protection.

Executive Summary

We welcome the opportunity to comment on the effect of various technological developments on the structure, functioning, and integrity of financial markets. CFA Institute has commented extensively on these issues[1] and published related research, including *The Structure, Regulation, and Transparency of European Equity Markets under MiFID (2011)* and *Market Microstructure: The Impact of Fragmentation under the Markets in Financial Instruments Directive (2009)*[2].

Over the past decade, technological advancements, combined with regulatory changes, have enabled competition amongst trading venues to first flourish and then intensify. The equity

[1] See, for example:
- *Comment Letter to IOSCO on Issues Raised by Dark Liquidity* (2011): http://www.cfainstitute.org/Comment%20Letters/20110211.pdf
- *Comment Letter to European Commission on the Review of the Markets in Financial Instruments Directive* (2011): http://www.cfainstitute.org/Comment%20Letters/20110202.pdf ;
- *Comment Letter to CESR on Micro-Structural Issues of the European Equity Markets* (2010): www.cfainstitute.org/Comment%20Letters/20100430_2.pdf ;
- *Comment Letter to U.S. SEC on Equity Market Structure* (2010): http://www.cfainstitute.org/Comment%20Letters/20100622_2.pdf ;
- *Letter to U.S. SEC on Sub-Penny Trading on Regulated Exchanges* (2010): http://www.cfainstitute.org/Comment%20Letters/20100106.pdf

[2] The reports are available at http://www.cfapubs.org/loi/ccb

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markets of today represent a vast, decentralised electronic network, critically dependent on technology to generate and match order flow at ever greater speeds. Whilst certain trading costs have fallen, the fragmentation of liquidity across this network, combined with the speed and automation with which transactions are executed, has raised various issues for market participants. Investors and regulators have expressed concerns over the depth of liquidity, the efficiency of public price discovery, transparency, fairness, and the resiliency of equity markets, most notably in the United States and Europe.

CFA Institute believes that the efficient functioning and integrity of the equity secondary markets is of utmost importance to serve the diverse needs of all types of investors. In general, we believe that policy measures should be designed to foster greater transparency and greater consistency in the regulatory framework, so that all functionally similar trading venues and trading activities are subject to similar rules. Such a policy approach would help to preserve the integrity of the price discovery mechanism carried out by 'lit' markets, bolster market liquidity and efficiency, and mitigate the potential for the distortionary effects of regulatory arbitrage arising from uneven rules among similar types of trading venues.

The Consultation addresses the current state of the markets and the risks posed by certain technological and market developments; high-frequency trading (HFT) and the potential risks it poses to market efficiency, integrity, and stability; and the regulatory initiatives taken to date, both by national authorities and by IOSCO through its international principles on matters such as dark liquidity, direct electronic access, and screen-based trading. We commend IOSCO for providing a comprehensive account of each of these areas.

CFA Institute's positions are summarised as follows:

1. CFA Institute believes that urgent regulatory attention is needed to address the problem of sub-penny trading. This practice discourages investors from submitting passive limit orders because those orders are frequently stepped in front of by off-exchange executions that obtain execution priority by offering only nominal price improvement, often in the magnitude of $0.0001 per share. Such transactions offer little economic benefit to the end investor compared with the cost incurred by market participants posting limit orders who lose that opportunity to trade. Consequently, the incentive to displaying a visible limit order is reduced, which in turn can adversely affect market liquidity and public price discovery.

2. It is appropriate that proprietary trading firms, including HFT firms, be subject to appropriate and proportionate regulation. This would include registration/authorisation (where it is not currently required), and similar organisational requirements as those that apply to other regulated investment firms, including risk management obligations and adequate levels of capital.

3. Firms providing sponsored access should implement robust risk management procedures and controls and retain adequate oversight of the activities of their clients utilising sponsored-access arrangements. Such controls are necessary to protect the integrity and efficient functioning of the markets and to prevent noted risks developing into systemic

threats. We also believe that firms engaging in automated trading (such as algorithmic and high-frequency trading) should implement robust internal risk management procedures and controls over their algorithms and strategies as part of best practice.

4. Circuit breakers and/or other more sophisticated forms of trading limitations can be an effective tool for curbing excessive market instability. They should be applied consistently across all trading venues in order to provide investors with assurance that, irrespective of where they trade, the same protections are in place.

5. CFA Institute believes that, if HFT firms, systematic internalisers and/or over-the-counter market makers (or other investment firms) are afforded certain privileges that are not available to other investors, such as faster data access to exchange servers and/or mechanisms that allow them to see order flow before other market participants, then it would be appropriate to subject such firms to certain obligations, such as a requirement to provide liquidity irrespective of the direction of market movements.

6. Regulatory authorities and market centres should ensure that they have adequate surveillance technology to identify instances of market abuse (whether via the use of manipulative computer programs or otherwise) and take appropriate action as prescribed under existing laws and regulations.

7. CFA Institute believes that trying to curb HFT activity through direct, targeted and punitive regulation is inappropriate and would likely result in unintended consequences. In our view, it would be more effective for regulators to oversee such firms in the same manner as other firms engaged in similar activities (see discussion in point #5 above). Likewise, regulators should focus on risk management (pre- and post-trade risk controls) rather than try to intervene in the trading process or to restrict certain types of trading activities via fees or charges.

8. Co-location services should be made available to all investors wishing to pay for these services. The fees charged should be fair and non-discriminatory.

Please do not hesitate to contact us should you wish to discuss any of the points raised.

Yours faithfully,

/s/ *Rhodri Preece*

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With headquarters in Charlottesville, Virginia, and offices in New York, Hong Kong, London and Brussels, CFA Institute is a global, not-for-profit professional association of more than 106,000 investment analysts, portfolio managers, investment advisors, and other investment professionals in 135 countries. Of these, more than 95,000 hold the Chartered Financial Analyst® (CFA®) designation. The CFA Institute membership also includes 135 member societies in 58 countries and territories.

CFA Institute develops, promulgates, and maintains the highest ethical standards for the investment community, including the CFA Institute Code of Ethics and Standards of Professional Conduct, Global Investment Performance Standards ("GIPS®"), and the Asset Manager Code of Professional Conduct ("AMC"). CFA Institute is best known for developing and administrating the Chartered Financial Analyst® curriculum and examinations and issuing the CFA Charter.

Our specific comments in response to the consultation's questions are set out below.

Specific Comments

1. *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?*

CFA Institute is not a direct participant in financial markets. However, certain of our members who are active participants in the equity markets have expressed concerns that the current market structure (particularly in the United States) discourages the provision of displayed liquidity. Specifically, this is due to giving certain market participants privileges that are unavailable to other investors, such as faster data access to exchange servers and/or mechanisms that allow them to see order flow prior to other market participants.

Investors who submit passive limit orders frequently find that those orders aren't executed because of rules in some countries that enable certain entities to trade ahead of displayed orders. In fact, we have been advised that when these transparent orders do get filled, it is usually because the orders are on the wrong side of the market. Consequently, investors have very little incentive to display a visible limit order, which in turn can adversely affect market liquidity and public price discovery.

CFA Institute firmly believes that urgent regulatory attention is needed to address this problem. Among other things, regulators should level the playing field between exchanges and off-exchange venues. Furthermore, rules should give execution priority to displayed orders.

2. *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?

Proprietary trading firms, including HFT firms, should be subject to registration/authorisation (where this is not currently required), and similar organisational requirements as those that apply to other regulated investment firms, including risk management obligations and adequate levels of capital.

Indeed, it is our view that all firms engaged in functionally similar activities (for example, HFT liquidity providers and traditional market makers) should be subject to similar rules and obligations. Our concern with proprietary trading firms such as HFTs and systematic internalisers is not what they do, but that they are able to benefit from their activities while remaining exempt from the obligations typically required of those activities.

In the case of HFTs, they have the type of privileged access available to traditional market makers, yet they are not burdened from the kind of obligations of traditional market makers, such as continuously and actively making markets, capital requirements and regulatory oversight. Similarly, we are concerned that, in certain jurisdictions such as the United States, systematic internalisers are able to use their positions as dealers to not only have an advanced look at the order book but also to trade ahead of existing market orders.

We are less concerned with firms that access the markets as customers of an intermediary so long as they must operate under that firm's trading rules and those rules are adequately enforced. Under such circumstances, an intermediary should bear some responsibility for the activities of their customers and should be penalized, as well, if its customer engages in abusive or illegal activities. This, we believe, will give intermediaries incentives to carefully vet their customers prior to giving them access and to monitor their activities once they begin using that access.

In short, regulators should adopt a consistent approach to regulation of HFT and other proprietary firms.

3. *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?*

CFA Institute is of the view that firms providing sponsored access (i.e. investment firms who allow their systems to be used by other traders) should implement robust risk management procedures and controls and retain adequate oversight of the activities of their clients utilising sponsored-access arrangements. Such controls are necessary to protect the integrity and

efficient functioning of the markets and to prevent noted risks developing into systemic threats.

We also believe that firms engaging in automated trading (such as algorithmic and high-frequency trading) should have to implement robust internal risk management procedures and controls over their algorithms and strategies as part of best practice. They also should disclose such controls to the appropriate regulatory authorities.

With regard to some of the regulatory measures that have been proposed in relation to the use of, and risks posed by, HFT, we do not believe it is feasible for regulators to review and/or 'approve' algorithms prior to their use by firms. If regulators are asked to approve algorithms, we foresee three important problems. First, it is likely that regulatory authorities would lack sufficient expertise and/or technological resources to be able to understand and then vet algorithms. Second, even if this impediment could be overcome, regulatory authorities would then have to monitor the algorithms on a real-time basis to make sure they are aware of all modifications, that those modifications have been stress-tested, and that the outcomes of those tests are acceptable. Third, this approach could ultimately lead to approval for only a small number of algorithms, thus encouraging all firms to use systems that have already received approval. This could lead to herd-type trading, which may exacerbate market swings.

4. *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)?*

Circuit breakers and/or other more sophisticated forms of trading limitations are an effective tool for curbing excessive market instability. We have seen how they help protect the efficient functioning and robustness of markets.

For circuit breakers to be effective in combating market instability, they should be applied consistently across all trading venues (whether via a self-regulatory initiative or regulatory mandate). This would provide investors with assurance that, irrespective of where they trade, the same protections are in place.

5. *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?*

In many trading venues, HFT firms act as de-facto market makers under normal conditions. As the Consultation notes, they are estimated to account for over a third of equity trading activity in Europe and over one half of activity in the United States. Consequently, the market is highly dependent on the liquidity such firms provide.

Absent any formal obligations, HFT firms can choose to withdraw the liquidity they provide under adverse market conditions or during times of instability. This could have destabilising effects. As the Consultation notes (p.27),

> *"The events surrounding the May 6 flash crash suggest that HFT firms, whilst not triggering the crash, rapidly withdrew from the markets as they began to move, thereby intensifying the liquidity crisis… The main concern is that the fast and automatic operation of algorithms by HFT firms may increase transitory volatility in both normal and turbulent market conditions… The impact of this phenomenon might be amplified by the difficulty met by some investors in promptly interpreting the effective level of liquidity available in the market."*

CFA Institute believes that, if HFT firms (or other investment firms) are afforded certain privileges that are not available to other investors, such as faster data access to exchange servers and/or mechanisms that allow them to see order flow before other market participants, then it would be appropriate to subject such firms to certain obligations, such as a requirement to provide liquidity irrespective of the direction of market movements.

6. *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.

We have not fully considered the issues raised by this question with our members.

7. *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?*

No comment.

8. *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.*

Such conflicts are, in many ways, at the root of our concerns about internalisation. Firms who act as internalisers may also engage in operating crossing networks and proprietary trading activities, and are potentially invested in other trading venues as well.

As stated above, we believe the best manner for regulators to manage these issues is to oversee all trading venues by use of a common rulebook. Likewise, we believe regulatory authorities should impose similar obligations on all entities that are engaged in market making activities.

9. *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?*

Market abuse rules are typically based upon two fundamental principles, namely market manipulation (employing abusive practices to artificially move prices up or down) and insider trading (dealing on material, non-public information prior to its dissemination).

These principles remain just as relevant in today's market as they always have done. Consequently, existing laws and rules built upon these principles should be sufficient to cover any type of order, whether generated by a human or a computer (in the case of the latter, it is the human who programs or instructs the computer to carry out the order).

Market centres and regulatory authorities should ensure that they invest adequately in surveillance technology to enable them to detect and combat market abuse.

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

The Consultation highlights four strategies that may raise particular concerns (p.28), namely, momentum ignition, quote-stuffing, spoofing and layering[3]. Each of these is an example of market manipulation. As noted in the response to the previous question, authorities should ensure that they have adequate surveillance technology to identify such abusive practices and take appropriate action as prescribed under existing laws and regulations.

The Consultation also notes that there is no clear evidence to date of systematic and widespread use of abusive practices by those engaging in HFT.

11. *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?*

CFA Institute believes that trying to curb HFT activity is inappropriate and would likely result in unintended consequences. In our view, it would be more effective for regulators to focus on appropriate oversight, including risk management (pre- and post-trade risk controls)

[3] IOSCO defines these as follows (see Consultation p.28, footnote 41): "Momentum ignition: with this strategy, the proprietary firm may initiate a series of orders and trades (along with perhaps spreading false rumours in the marketplace) in an attempt to ignite a rapid price move either up or down; spoofing is an abusive practice where the use of displayed limit orders are used to manipulate prices; layering: with this strategy a [market participant] layers the book with multiple bids and offers at different prices and sizes, generating an enormous volume of orders and high cancellation rates of 90% of more. The orders also may have an extremely short duration before they are cancelled if not executed, often of a second or less."

rather than trying to intervene in the trading process or restrict certain types of trading activities.

Imposing charges, fees, or caps on messages and/or order-to-trade ratios may pose risks to market integrity and efficiency. For example, attempting to limit the ratio of orders submitted to transactions executed, via a cap or an explicit charge, may restrict the ability of investors engaging in statistical arbitrage (a significant source of liquidity) to adjust their quotes in response to changes in the fair value of related securities. This would result in pricing inefficiencies across related financial instruments and markets. This could discourage investors from engaging in such activity, thereby reducing the depth of displayed liquidity.

Whilst we acknowledge that such charges or fees may reduce the volume of message traffic (itself a cost to the market ecosystem), this potential benefit is outweighed by the cost of reduced participation in the lit markets, and the loss of transparency, liquidity, and pricing efficiency that might result.

A further consideration is that any additional charges or fees end up being passed on to the end customer.

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

We agree with this assertion. Co-location services should be made available to all investors wishing to pay for these services. The fees charged should be fair and non-discriminatory.

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

It is prudent for firms utilising algorithms to undertake robust stress testing of those algorithms prior to their adoption. It should be left to market operators to work with their customers to determine what requirements (if any) are needed to facilitate such stress testing.

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

We have no further comments.