Capital Markets CRC Limited

CRC AUSTRALIA

10 August 2011

To: Mr Werner Bijkerk

By email at: market-integrity@iosco.org

Re: Public Comment on Consultation Report: Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency ("Consultation Report")

In response to the publication of the above, we are pleased to provide some comments in our capacity as a leading research facility focusing on optimal securities market design. The Capital Markets Cooperative Research Centre ("CMCRC") combines academic research and industry expertise to foster innovative research and products designed to assist regulators in their mandates. In particular, we seek to assist regulators in discriminating between market design changes that add to, or detract from, the quality of a securities market. We welcome the opportunity to comment on the Consultation Report and to suggest a robust approach that IOSCO will find useful in its quest to determine the impact of changes to market design, such as technological innovations on market integrity and efficiency. This is a difficult task in view of the speed, complexity and number of recent changes to securities market design, and we commend IOSCO on its efforts.

We will focus our comments on the objectives of the Consultation Report and its arguments about the impact on market quality of recent developments in securities markets. We also wish to comment on the responsibilities of market operators, participants, and self-regulatory organisations to assist the regulator in its efforts to enhance market quality, and on the cost of market surveillance in light of the recent developments.

Impact on market quality

IOSCO states in the Consultation Report that its objective is to address concerns about the impact of recent technological developments, in particular high frequency trading, on market integrity and efficiency. The Consultation Report seems to conclude that market quality has improved over time as a result of developments, in terms of volume, execution speed, transactions costs, liquidity and the capacity to withstand shocks[1]. It then voices concerns that High Frequency Trading ("HFT") and the market participants that use it "(HFTs") may now be harming the markets' quality and identifies possible correlations pointing to the nefarious impact of these market participants and this type of trading[2] while admitting that there is yet no evidence to relate these concerns to the activities of HFTs. Having postulated a number of possible correlations between recent developments in the market and changes in market quality, some of which are technological and some not (fragmentation, dark pools, declines in tick sizes, changes in volatility, HFT) the Consultation Report concludes that "whilst developments may have helped foster innovation and choice or improve

[1] Consultation Report, page 25

[2] Ibid, Chapter 4, section 5, Risks Posed to Market Integrity and Efficiency, pages 26 to 30

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market efficiency and liquidity, these same developments may also have had negative effects"[3] and that it seeks a "holistic evaluation" of the impact and risks of HFT to guide regulatory priorities.

Our reading of the Consultation Report leaves us unable to determine how IOSCO will carry out its evaluation of the changes to market quality resulting from technological developments. We respectfully submit that it cannot determine the impact of these developments or the risks they represent for the markets, either individually or collectively, since it lacks objective measures and evidence of the existence, magnitude, and persistence of changes to market quality, e.g., operational measures of market efficiency and market integrity. These measures exist, and they offer regulators the tools to track changes in their own market's integrity and efficiency, and to track them relative to the measures in other markets. They allow regulators to examine evidence of the impact of a change in market design such as HFT and to reassure themselves that the policy choices they make enhance market efficiency and integrity, or enhance one without detriment to the other. Without these evidence-based measures of market quality, the regulator is left postulating possible correlations and regulating by fiat. In the present case, it is unable to demonstrate whether or not the initiatives already undertaken to respond to the concerns have resulted in the desired outcome or whether/how further initiatives will.

In its 2010 Statement outlining the Objectives and Principles of Securities Regulation[4], IOSCO identifies three overarching objectives, namely, 1) investor protection, 2) ensuring fair, efficient and transparent markets and 3) reducing systemic risk. It adds 38 Principles by which practical effect can be given to these objectives by individual securities commissions, some of which are discussed in the Consultation Report. The key implication here is that the implementation of these principles will necessarily lead the members of IOSCO to fulfil their regulatory objectives. We are not convinced by this argument. The principles are both normative and generic in nature, that is, they don't deal with actual changes but rather general changes that should be made. Whether the specific market design elements implemented in each market (such as particular rules for the licensing of market intermediaries or particular trading systems) achieve the stated objectives depends upon being able to define and measure key outputs from this process in the marketplace, pre and post the change in market design.

If one accepts the relevance and necessity of demonstrating whether regulatory objectives are met, then it becomes necessary to devise evidence of the resulting output of the implementation of regulatory principles. The Consultation Report focusses on the impact of recent changes on market efficiency and integrity (or 'fairness'), and we agree that this is the appropriate output of the regulation of securities markets. It seems to us that regulatory mandates dictate that regulators must convince themselves that changes, actual or proposed, enhance both efficiency and integrity, or enhance one without detriment to the other; or stated another way, that the implementation of the IOSCO principles and other "tools"[5] result in the desired outcomes, and to what extent.

Responsibilities of SROs, market operators and market participants

Notwithstanding that securities commissions must ultimately authorise changes to market design, we contend that the party that motivates the change to the market's design (regulators in the case of national regulatory changes but market operators in the case of high frequency trading or membership rules of exchanges) has the responsibility to provide evidence of the impact of the change on fairness and efficiency. The self-regulatory organisations and market participants that are

[3] Ibid, Chapter 5, Conclusions and Questions, page 41

[4] See http://www.iosco.org/library/pubdocs/pdf/IOSCOPD329.pdf

[5] Such as those described in Chapter 4 of the Consultation Report, pages 31 to 40.

the subject of many IOSCO principles must directly assist the regulators in achieving their objectives by providing evidence that the changes they want authorised will not adversely impact either market fairness or efficiency. That means that self-regulatory organisations, market operators, financial intermediaries, large investors, all must demonstrate how they contribute to achieving the optimal market design and how proposed changes either detract or enhance the collective effort. Although it would be optimal to provide evidence of the impact before such changes took place, in most instances markets do not have this luxury, because the change being contemplated is new. One then has to accept that an important part of affecting a market design change is an ex-post study of its impact on fairness and efficiency. In the context of accepted regulatory mandates, a market design change must enhance, and certainly not detract from, either efficiency or fairness/integrity.

Market Quality: A Proposed Framework

Given that we feel that it is sufficiently important to objectively discriminate between alternative market design choices based on their impact on market quality, the CMCRC has spent the last 10 years building infrastructure (which includes an underlying theoretical framework, applications and data) designed to measure the impact on market quality of the choices made by regulators about the market design they implement or propose. The framework is described in the exhibits 1 and 2 below[6]. Exhibit 1 characterises the overall Market Quality framework. Under this framework, market design changes consisting of changes in five broad areas, namely, technology, regulation, information, participants and instruments are required to pass tests of market quality. Market Quality in turn is divided into two core concepts of market efficiency and market integrity, and to pass the tests one must provide empirical evidence that the changes (actual or proposed) will enhance both market efficiency and market integrity, or enhance one without detrimentally affecting the other. Exhibit 2 further develops the framework by defining the two key concepts and identifying empirical proxies to assist in measurement. Through this framework, we contend that a regulator is able to measure a market's efficiency and its integrity and to report changes in the measures pre and post important market design changes such as the introduction of HFT. These measurements can also be used to compare how well one market fares against other markets at a point and/or over time with the implication being that markets that have higher quality have more optimal designs.

Exhibit 1
Market Quality Framework

[6] For a more detailed description, see M.J. Aitken and F.H. de B. Harris, *Evidence-Based Policy Making for Financial Markets: A Fairness and Efficiency Framework for Assessing Market Quality*, The Journal of Trading Summer 2011, Vol. 6, No. 3: pp. 22-31. For a more technical exposition of the framework see *Trade-Based Manipulation and Market Efficiency in the wake of the Introduction of Automated Surveillance Systems: A Cross-Market Comparison,* by Michael Aitken, Rick Harris and Shan Ji.

Exhibit 2

The framework briefly outlined above is only one of three critical pieces of infrastructure necessary to provide evidenced-based policy decisions. The second piece of the infrastructure is data, including the hardware and software to store and manage it. While securing data for single markets is a reasonable start, having access to data from multiple markets allows one to work out whether differences in design implemented by one market makes a difference to its fairness and efficiency relative to other markets.

Further, if one has any hope of doing "what-if" type evidenced-based policy analysis, a useful piece of evidence is the impact of the change on fairness and efficiency in other markets. For this reason the CMCRC has developed a database of intraday trade, quote and information announcement data for 40+ world markets. This data was secured from Reuters over a ten year period. A front-end piece of software created to help manage sampling of the data has been developed by SIRCA[7], a partner organisation to the CMCRC. The third piece of the infrastructure puzzle is a piece of software that facilitates easy manipulation of the data by parties who are not necessarily computer trained. The CMCRC uses a piece of software called SMARTS[8] for this purpose.

The end result of combining the three pieces of infrastructure is a Market Quality Report. In these reports, markets can compare themselves to other markets at a point in time or across time. Time series changes in efficiency and fairness metrics should correlate with changes in a market's design and differences between markets on fairness and efficiency should ultimately be traceable to market design differences. Alternatively, when a market design change is contemplated or affected, using some or all of the metrics identified in Exhibit 2, securities regulators (or those with SRO responsibilities) should be able to objectively determine whether the change has been good or bad for the market in terms of its affect on fairness and efficiency proxies. If the change has occurred elsewhere, its likely effect can be measured and contemplated. If the change has not occurred elsewhere, then the impact of the change can only be measured in the wake of the change. Either

[7] See www.sirca.org.au
[8] See www.smartsgroup.com

way however, it is possible to provide objective evidence on the impact of the change upon the efficiency and fairness of a marketplace, which we contend is the primary focus of a securities market regulator's objective. The CMCRC is experienced in providing estimates of market quality metrics and changes therein for every major securities market in the world.

Market Surveillance

The Consultation Report voices concerns about the capacity of regulators to do effective market surveillance in light of the recent developments to the markets and the cost of the technological infrastructure required to respond to the concerns they raise. In a recent article[9], the CMCRC provides an estimate for the cost and time required to develop the infrastructure for real-time crossmarket surveillance. Based on our experience and the data available today, it would take about 3 years and approximately $150 million initially and $50 million each year thereafter to maintain and run a real-time crossmarket surveillance capability for all European exchange-traded markets. If one assumes that the underlying data would be provided by market stakeholders for zero cost, the bulk of this estimated cost is building connectors into a system of surveillance software. With the requisite software to store, organize and process the data, and with the market quality framework of analysis, regulators and market operators would be able to conduct real-time crossmarket surveillance and evidenced-based policy-making for the first time.

We trust you will find our comments, framework and suggestions useful and remain,

Yours faithfully.

CAPITAL MARKETS CRC LIMITED

Alex Frino
Chief Executive Officer

Michael J. Aitken
Chief Scientist

[9] M.J. Aitken and F.H. de B. Harris, *Evidence-Based Policy Making for Financial Markets: A Fairness and Efficiency Framework for Assessing Market Quality*, The Journal of Trading Summer 2011, Vol. 6, No. 3: pp. 22-31.