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Reference Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency (CR02/11)

Date 11 August 2011

Dear Mr. Bijkerk,

Optiver would like to thank you for the opportunity to provide you with our views on the consultation report "Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency". Optiver fully supports regulatory developments which enhance market integrity and efficiency. We would like to compliment IOSCO for taking the initiative and addressing the issue.

In case you might have any further questions or you would like to receive additional explanations following our response, please do not hesitate to contact Willem Sprenkeler at +31 20 708 74 93.

Optiver

Optiver is a global electronic market maker, providing liquidity in markets in Europe, the U.S. and the Asia Pacific region. Optiver's headquarters are located in Amsterdam, with additional offices in Chicago, Sydney, Hong Kong and Taipei.

By posting two sided, continuous markets and taking advantage of relative pricing differences between related securities, we narrow the spread, which benefits pension funds, institutions, retail investors and all other market participants. By doing so Optiver adds value for the investing public. We concentrate on understanding and simplifying the relationships between financial products, then making the most competitive markets in them. Our trading strategies utilise real time information, advanced technology, transparent risk management systems and continuous innovation.

Optiver is a strong supporter of open and transparent markets, with a level playing field for all.

Response to the questions in the consultation report

We believe that many of the questions below are consultation matters in their own right and justify more detailed and separate attention by IOSCO. Below we will provide a brief response to these questions.

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?

We note the emphasis of this question on lit markets. We would like to point out that unlit markets continue to be a significant discouragement to efficient price formation on lit markets. Unlit markets continue to have a negative impact on the benefits of technology in lit markets.

Trading and technology are not mutually exclusive. They are inseparable and directly correlated. Over the decades technological advancement has had a profound impact on the way financial instruments are traded in general. The greatest development in technology has been the reduction in latency.

These technological advancements have enabled investment firms to do hundreds of trades on several different markets faster than the blink of an eye. This evolution in the marketplace is often categorised under the umbrella of high frequency trading (HFT) and has become a topic of fierce discussion in recent years, but we believe HFT is nothing more or less than an evolution of a system that has been in operation for decades.

Market makers like Optiver have always been early adopters of new trading technologies. In strict price-time priority markets, a market makers' success depends on it being among the first to post the best available prices. Technology has thus enabled market makers to increase liquidity and reduce spreads. Furthermore speed is important from a risk management point of view, because it allows them to quickly update their quotes when market circumstances change.

HFT is also typically used by firms that employ statistical arbitrage strategies. Just as in market making activities the profit per trade is usually very small, so these strategies are usually implemented in automated fashion using HFT.

Recent scientific research has shown that, when used for market making activities or employed in statistical arbitrage, HFT generally increases liquidity to the markets and reduces the volatility. Furthermore it reduces the spreads, leads to lower tick increments and thus improves the overall market quality.[1] These

[1] Some critics of HFT state that liquidity these days is lower because "size at the best bid offer" or "size at the top three price levels" has reduced. This statement on liquidity is however not accurate. If the tick size in an instrument used to be 5 cents and is now 0.5 cent than one can argue that liquidity on the bid and offer in a 1 cent wide market is not as liquid as it used to be in the ten cent market, but if you take all the liquidity into account and compare the old ten cent spread with the new *ten* cent spread than one will find that liquidity has actually improved significantly.

effects of HFT benefit all market participants, from small retail investors to large brokers and institutional investors.

The technological developments have also enabled firms like Optiver to be active on a larger scale than previously possible. This has led to more activities (more markets, more products) with less means, which consequently led to lower fees for our services (providing liquidity), especially while our competitors are subject to the same circumstances.

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?

Along with fast moving technology comes fear and misunderstanding.

Optiver believes it is important that all trading firms that have direct access to the market (including high frequency firms) and regardless of size, are subject to regulatory authorization and supervision. The focus of this supervision of proprietary trading firms should be on the organisational requirements and systems and controls.

We would like to point out though, that if a high frequency trader is a participant of the exchange then it is already subject to the automated trading rules of the exchange. And if a high frequency trader operates through sponsored access then the high frequency trading firm and the sponsoring broker work together to ensure that the automated trading rules are complied with.

If this question from IOSCO is inferring that a high frequency trader might have a separate distinguishable registration, we would strongly disagree to this. We believe that regulations should be technology neutral. The risk in attempting to regulate technology is that the underlying principles behind regulation are not properly discussed and identified. Also technology changes so rapidly that regulations become rapidly redundant. We have no issue with HFT *principles* for behaviour being clarified. This indeed would be very helpful for example to clarify market behaviours such as order to trade ratios and order cancellation principles. We would agree with better principles based regulation in relation to HFT.

Regarding sponsored access we believe it is good to note that companies providing access should be responsible for the risk controls and held accountable if not taken care of. Furthermore it is important to stress the importance of aligning requirements between direct members and participants using sponsored access to ensure that these are subjects to the same terms and conditions.

Also we point out the wide range of regulatory inconsistency in relation to sponsored DEA controls globally. For example, in the US, the exchanges specify the filter systems which a broker connect to when they provide access to sponsored clients. Other jurisdictions are not clear as to the specific requirements of

sponsored filters and no guidelines are given on filter specifications, particularly third party software systems. This topic requires a more full review and discussion of required principles.

Finally we would like to stress that we support opening up of all markets to *remote membership*, allowing foreign firms to become a member and to trade in their own name

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?

In general we would like to start by saying that we believe *all professional market participants*, including automated trading firms have a responsibility to have sufficient risk controls in place to prevent causing market disruptions.

Proprietary trading firms are trading with their own money and as a result have numerous safeguards in place, both technological and process based, to address the operational risks from runaway algorithms. One should bear in mind that erratic trades are very expensive for the originating firm and are often recognized as existential threats by such firms. Beyond this there are also many safeguards in place at the exchange level (as well as the clearinghouse level), to avoid these breakdowns to escalate.

Filters

With regard to regulatory requirements around pre- and post-trade risk controls Optiver believes the first key plank and emphasis in relation to algorithm control should be on filters and we are convinced this requirement should be seen as even more critical than testing requirements. The current industry paradigm or thinking in relation to algorithms, is to emphasise development and testing over the importance of filters.

In the well-known "Credit Suisse" algorithm case as published by the NYSE Euronext Hearing Board in January 2010, the findings were that Credit Suisse had failed to "*adequately supervise development, deployment and operation of proprietary algorithms*". The notion of filters was added as a subsequent 'also' comment, saying the company "*also failed to adhere to principles of good business practice…not have appropriate checks to prevent submission of*..." A better consideration of this case we believe is in the reverse, that is, that the primary issue was that there were not appropriate checks or filters to prevent erroneous submissions and the 'also' was that the algorithm development and testing was not adequate.

Definition of an algorithm

Furthermore we notice that there is no clear and consistent definition of an 'algorithm'. Current regulatory discussion of the term 'algorithm' often assumes it is some finite, mutually exclusive, single identifiable component. Algorithms are far more complex than this. Trading systems are complete end-to-end processes in a complex operating environment system where there can be no divisible identification of 'an algorithm'. Much can go wrong in a complex trading system. Much more needs to be done to identify the

risks within trading systems from an end to end perspective. Approaching this by way of 'algorithms' is not necessarily the best way to ensure market integrity.

Algorithm testing and documentation

Next we believe there should be more clarification on the topic of algorithm testing and documentation. Much regulatory discussion takes place over terms like 'reasonable steps' and 'adequate'. Such is highly inadequate for so complex an area and much more discussion and clarification is required.

By way of example, a large international bank will typically manage its trading software development far differently than say a small proprietary trading firm. In a highly structured software environment in a large organisation there is typically a committee based approach to development. There can be very detailed stages in the approach. Typically there are separate and distinguishable steps of analysis, design, construction, testing and support. There can also be very clear and different lines of responsibility and segregation of duties. Separate IT roles can be involved such as analysts, software engineers and applications engineers. Differing IT standards can be followed e.g. COBIT, ISO 9000-3 and approaches can vary accordingly. Every step of the process from functional specification to logic documentation to testing and implementation can have varied levels of documentation.

Compare this to a small "prop firm" where only 2 people can be involved in the whole process. The IT engineer will cover all IT roles described above and the user can be also involved in testing and acceptance procedures. By way of example, in relation to documentation, the IT engineer may simply allow the code itself to document the logic and no more documentation exists. The whole IT process from end to end may be on record as email correspondences.

Should rules apply according to the nature and scale of the organisation? Or are rules intended to apply according to the complexity and potential impact of the algorithm? What does "reasonable" and "adequate" mean? There are potentially as many "reasonable" and "adequate" approaches to algorithm development as there are algorithmic traders.

Regulatory approval for algorithms

We would like to express our strong concerns with the sometimes voiced proposal to require firms active in algorithmic trading to notify regulators of the design, purpose and functioning of algorithms. We regard this measure as disproportionate, especially if this would imply requiring upfront approval to utilize algorithms. We also believe regulators lack the resources to vet thousands of complicated algorithms (that also change very frequently). Finally it would create a moral hazard risk.

Regulating dark vs. lit markets

Finally Optiver believes it is important to once again point out the fact that all trading in the public markets is already subject to strict regulation, while anything that is trading in a non-transparent manner is still

under much less scrutiny. We believe this scrutiny for the lit markets to be deserved and the risk controls in general to be a good thing, but we would like to see this regulation extended to the entire market structure.

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)?

Exchanges have in the recent past become not much more than a simple matching engines. In that process we believe exchanges have passed too many responsibilities onto participants who have been provided little guidance or scope as to limit controls. Optiver believes regulators therefore need to provide a clearer and firmer framework for these exchanges to operate.

Optiver believes exchange operators should take a far more active and involved role in providing infrastructure and control capabilities. Currently there is a lack of clarity and sophistication as to filter responsibility and how this ties in with market integrity rules. Exchange operators we believe currently have little responsibility for preventing disorderly markets. There must be a more thorough analysis on the required responsibilities between market participants, market operators and regulators on interconnected issues such as threshold limits, cancellation levels, market circuit breakers and fair and orderly market requirements.

Order Entry Controls

We believe that both the *type* of and *level* of thresholds for order entry controls should be the subject of discussion between participants and market operators. As the starting point there need to be clear consultation as to the list of control types required and limits and control ranges.

Wash Trade Controls

We note current discussion in the US markets which is considering wash trade protection being implemented at Exchange Operator levels. This is definitely something we support.

Volatility Controls

Introducing risk controls in general, and circuit breakers in particular, are a good suggestion. Circuit breakers have been proposed specifically with the flash crash in mind and do indeed tackle the essence of the problem. The problem is that, now as well as in for instance 1987, the market place simply cannot at all times deal with a combination of 1) large size, 2) immediate and 3) indiscriminate buy or sell orders such as an avalanche of stop loss orders, limit free large buy or sell algorithms (which are essentially repackaged market orders) or a trading algorithm going berserk. Circuit breakers, which use has often been described as “calming the market place” are useful not so much to provide the said calm, but to remove the immediate (2) and the indiscriminate (3) part of the trading dynamic, allowing implicit demand to be made

explicit and participants with stop loss orders to reconsider their orders. Thus the aim of circuit breakers is not to limit price move, not even big ones per se, but to halt a market breakdown. Regulators should review, and in fact are reviewing, how circuit breakers can be configured so that they are most effective.

Our preferred option is an auction system whereby on defined criteria (such as both speed and price movement, which have been consulted and discussed with the industry), orders are immediately thrown into auction phase. This should be tied directly to the trade error policy such that both error trade and market volatility parameters all result in auction mode.

We would like to stress that it is important to harmonize these risk controls across all platforms to avoid them breaking down at one venue and consequently have all order flow move to the alternate platform. Furthermore volatility controls cannot be implemented in the cash market without consideration and dual implementation of volatility controls for all derivative products; options and futures inclusive.

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?

As a general remark Optiver believes that this is first and foremost a commercial matter. These schemes usually translate into better liquidity and quality of trading venues while they enable the market maker to improve the spread, consequently leading to better liquidity. This has been proven after the implementation of MiFID in Europe, when the introduction of new trading venues using these market maker schemes has led to substantially lower cost of trading for all. To impose minimum mandatory criteria as a consequence of these schemes and the above stated benefits does not make any sense.

As far as stub quotes are concerned we believe that their existence is not so much the problem, but rather the fact that there can be situations that they actually trade. Under normal market circumstances no one would be willing to sell a one cent bid in Google, but in extreme situations (such as the flash crash) this bid can become relevant all of a sudden (market orders hitting it). As a solution it would therefore be better to ensure that there are proper circuit breakers in place rather than prohibiting stub quotes. Furthermore we believe that inappropriate order behaviours including stub quotes are already covered in existing market manipulation rules.

We would suggest that if specific rules need to be made for market makers then regulators should firstly provide reasonable data and research to support any concern with market practices. Speculation or assumption should not be the basis of formulating market integrity rules for market makers.

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.

We believe that regulators themselves are better positioned to answer this question.

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?

Most exchanges do not seem to acknowledge the problem. This lack of attention opens the door for those abusing counter parties that do trade in good faith. This undermines the trustworthiness of exchanges and might cause an adverse effect on liquidity in particular during dividend season when such problems usually arise.

In this context it is good to mention the fact that there are also exchanges that do try to address this issue such as the Nasdaq OMX. They recently introduced a fee for late delivery with the option to further fine tune this fee benefitting the party suffering from the late delivery.

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.

As a liquidity provider, Optiver is concerned with current broker and bank discussion with response to client conflicts. In the worst cases this conflict manifests itself in internalisation and use of dark pools. This is wide spread and well researched and documented.

The formation and operations of internalisers are contrary to all basic principles of market efficiency particularly price formation which is dependent upon liquidity. The more that internalisers are permitted, the more that the efficient market is compromised. The real losers of internalising are retail investors whose spread of pricing is compromised. The current discussion is not focussed sufficiently towards the impact on liquidity and price discovery.

As a company that doesn't have customers we don't find ourselves in a position to comment on so called "Chinese walls" in companies that do have customers.

Having objective, clear exchange rules and regulations in place should tackle the possible problem of trading participants that are also shareholder in trading venues. In earlier ESMA consultations we indicated

that we in general strongly believe in the involvement of regulators when setting exchange rules to avoid possible conflicts of interest.[2]

In this context it is good to mention the contribution, in the form of increased competition, in the European trading landscape by trading participants that became shareholder in trading venues such as Chi-X.

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?

Some of these existing laws and rules, stemming from the former open outcry trading, might be somewhat out-dated. A good example of this would be trading against yourself which was obviously a clear violation in the past whereas today it can also be a logical consequence of automated trading, e.g. when different automated trading strategies accidentally trade against with other.

However, it must be stated that the majority of the existing rules and regulations sufficiently cover automated trading and are just as relevant in today's market environment as they were in the past.

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

It is sometimes claimed that HFT firms benefit from their technological and speed advantage by trading on flash orders and thus have an unfair advantage over other investors. Flash orders are indications of interest that are send to only a select group of market participants allowing them to trade against these orders before others. These so called flash orders actually date back to 1978 when they were first introduced and it seems therefore somewhat stretched to link them to HFT exclusively.

As strong supporters of a level playing field and transparency in general we support any move to ban flash orders from the market.

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?

This would have a contradictory impact on price formation and liquidity. It is in the best interest of a platform to ensure the best possible prices and liquidity. Imposing charges or fees on messages, cancellations or high order to trade rations will normally translate in wider spreads and reduced liquidity as a consequence. It also fails to address the question why this situations (high cancellation rate or high order-to-trade ratio's) exists in the first place.

The idea of limiting the order-to-trade ratio or the number of cancellations has been inspired by the notion that the high order cancellation rates are damaging investors, as they claim the quotes are not shown with the intention to trade. In fact these higher quote refresh frequencies are a natural consequence of tighter markets with similar volatilities, as a smaller change in underlying value will be enough to trigger a

[2] http://www.optiver.com/pdf/Optiver%20response%20-%20consultation%20on%20standardisation%20and%20exchange%20trading%20of%20OTC%20derivatives.pdf, p.10-11

necessary change. Limiting the number of times to cancel and update a quote would lead to wider spreads (as market makers lose the protection of being able to update their quotes) and a severe reduction in liquidity, as the number of individual price levels as well as the number of venues at which a market maker can quote will be lower (since execution at one requires adjustment of all quotes).

Furthermore it is good to mention that charges or fees on messages or cancellations are being abused by some exchanges to create a non-level playing field or to reduce competition in certain product categories.

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

We think it is important to ensure that offering co-location services takes place in a fair and non-discriminatory manner. The terms for co-location services should be economically reasonable and regulated to avoid abuse. As a result of regulatory changes (e.g. MiFID in Europe) and the more fragmented landscape it is important to note that there is a lot of pressure on exchanges and their earnings model. This leads them to look for alternative sources of income. Co-location services and the dissemination of data are two clear examples where this becomes apparent. Although many exchanges are providing fair and equal access, we do notice an increased cost in operating co-locations. Enabling smaller participants to get fair access to these locations is also an important consideration and should be covered by defining economically reasonable terms. The recent changes in the market structure landscape should not result in a co-location 'toll road'

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?

It is advisable to have testing environments in place for these purposes, but almost all exchanges already offer this service.

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?

We are of the opinion that the previous questions cover the topic, but will be happy to provide additional info when required.

As a final comment we would emphasise that market integrity rules should be technology neutral and be clearly principles based.

We believe that unlit markets and internalisers are the most significant market integrity issue.

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