30th April 2010

CESR Call for Evidence

Micro-structural issues of the European equity markets

NYSE Euronext responses

I. High frequency trading (HFT)

1. Please describe trading strategies used by high frequency traders and provide examples of how they are implemented.

High Frequency Trading is not a trading *strategy* by itself. Rather it is a new *method* of trading that operates in a drastically compressed time scale compared to more traditional methods. The investment horizon may range from a fraction of a second to one or two days, with the aim of systematically capturing short term alpha[1]. HFT[2] is generally highly quantitative and process driven, emphasizing efficiency and automated decision making techniques applied to capture micro-market inefficiencies. The strategies used by HFT are varied and include market making, statistical arbitrage, momentum trading and liquidity detection. Furthermore, HTF may be used for own account or for client trades.

HFT captures short-term alpha that was not systematically extracted before and was considered by the other market participants as a short-term opportunity gain/loss. The money making of HFT strongly relies on research, not in fundamental corporate investment research, but in statistical and technological research around trade data, with a focus on the interplay of execution prices for securities on traded markets. Traditional market analysts provide *depth* of understanding of a company in order to make predictions on price movements. HFT research is complementary in that it provides *breadth* by making short-term price variations more coherent between stocks, asset classes, regions or historical patterns.

By taking the same arbitrage strategies that have existed since decades in all their diversity, but by applying them to capture short-term alpha, they are not exposed to mid-term market volatility, interest rates variation, world conditions or news. They are high volume, low margin market participants. Most of the time, HFT have market-neutral positions at the end of

[1] Alpha is commonly used in the financial literature to measure the return in excess of the compensation for the risk taken when investing. It indicates how an investment has performed after taking into account the risk it involved. It has been shown that in an efficient market, the expected value of the alpha coefficient is zero.

[2] The American research Company TABB defined HFT as "fully automated trading strategies that seek to benefit from market liquidity imbalances or other short-term price inefficiencies". At a December 2009 conference in New York organised on HFT: "systematic, quant-based models with holding periods ranging from a fraction of second to less than one day".

the day, which makes them highly dependent on the number of signals and short term inefficiencies that are detected during the day. They rely on the quality of data and the speed of execution to manage their risk, making them strong supporters of transparency and highly latency sensitive. These are not risk free strategies, but simply different risk taking strategies.

2. Please provide evidence on the amount of European trading executed by HF traders (including the source(s) of that information). CESR is particularly interested in statistical material on: a) market share of HFT in orders/trades in Q1/2010 (and, if possible compared to 2008 and 2009), b) average trade size in Q1/2010 (and, if possible compared to 2008 and 2009), c) market participants, d) financial instruments traded (including cash vs. derivatives). If possible, please distinguish between HFT on transparent organised trading platforms and on dark pools of liquidity.

HFT volumes are necessarily *estimated*. However, by identifying those dedicated HFT firms on our markets and by approximating the HFT flows from other firms, NYSE Euronext estimates that HFT represented around 23% of total transaction value during Q1-2010 on its regulated markets. This is up from 5% in Q1-2007, which can be considered as a reference period before the implementation of MiFID.

The average HFT *order* size has remained stable since 2007 at approximately €8,000. This order size is not directly correlated to initial market liquidity, but rather to the size of the short-term market inefficiencies and frictional costs between markets. Above €8,000 the HFT may risk market impact in providing information to the market. Below this figure the trade may not be cost efficient.

HFT order submission is not the only driver of the trade size decrease observed since 2007. Other factors have favoured the average trade size decline:

- the increasing use of algorithmic trading from brokers who further slice their orders before sending to the market;
- the increasing use of VWAP analytics from final investors to assess the execution quality of their intermediary, forcing the latter to further slice their orders to limit market impact.

On NYSE Euronext's regulated markets, HFT is performed by a variety of market participants, from players only dedicated to HFT, to hedge funds using DMA access, through to global investment banks. This diversity means that HFT is a competitive business on our markets.

3. What are the key drivers of HFT, and (if any) limitations to the growth of HFT?

The drivers of High Frequency Trading are well documented, and include:

- New technological developments enabling increased capacity to access, process and transfer information;
- Automated decision making capabilities;
- New research and development targeted at improving the modelling of risk and market efficiencies;
- Lower frictional costs of trading in Europe

A further major driver has been the direct and indirect impacts of MiFID implementation, which has created an ideal environment for HFT:

- Liquidity has been fragmented, creating more opportunities from short term market inefficiencies on the same underlying instrument across platforms;
- Maker-taker pricing and other financial incentives for liquidity provision (e.g. maker rebates) have made viable previously unprofitable investment strategies;
- The competitive race of declining latency in the matching process on any single venue, across the range of trading venues have created opportunities for latency arbitrage;
- No limits to tick sizes.

This growth has not been without controversy. HFT has created more dynamic and faster moving order books, which has obliged other market players to revise their traditional understanding of order book liquidity and to invest in technology to keep pace with market innovations.

Algorithmic trading, of which HFT is a subset, may well one day make up the majority of trading volumes in Europe. However, by their nature, the weight of HFT volumes is self-regulating. This is because above a certain level, HFT flows will start to trade against each other too frequently, thereby eliminating the poorer performing ones, as the interaction becomes a zero-sum game.

4. In your view, what is the impact of high frequency trading on the market, particularly in relation to:
- market structure (eg. tick sizes);
- liquidity, turnover, bid-offer spreads, market depth;
- volatility and price formation;
- efficiency and orderliness of the market?

Please provide evidence supporting your views on the impact of HFT on the market.

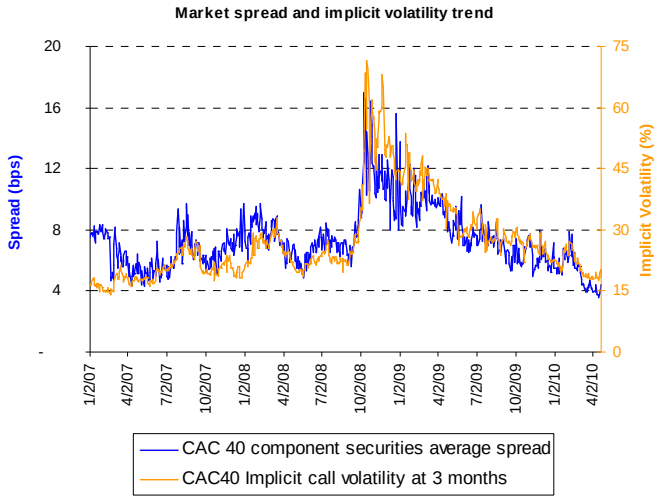
There is a consensus among researchers that assessing the liquidity impact of any market design changes over the last two years is rendered difficult by the greater volatility in markets following the financial crisis. However the main evidence we have so far on some key

liquidity indicators does not demonstrate any negative impacts of HFT on the liquidity of NYSE-Euronext[3].

In the following analysis, liquidity is broken down into three metrics: spread, intraday volatility and disclosed volume.

(i) Spread: the difference between the best bid and the best ask available relative to the mid-point.

The following chart shows the evolution of both market spread at touch and implicit volatility on the CAC40 since 2007. We observe that it is highly correlated. The relative bid-ask spread was in the range 6-8 basis points from the beginning of 2007 to October 2008. Then it increased dramatically following the credit crisis, as overall levels of liquidity on all financial markets were affected. It took nearly one year, until October 2009, before both the implicit volatility and the relative spread reverted back to their initial level. This correlation is estimated at 92% during the first months of 2010, indicating that liquidity conditions are closely linked to macro-economic indicators. We therefore do not see any evidence of negative impact of HFT on market spreads on NYSE Euronext.

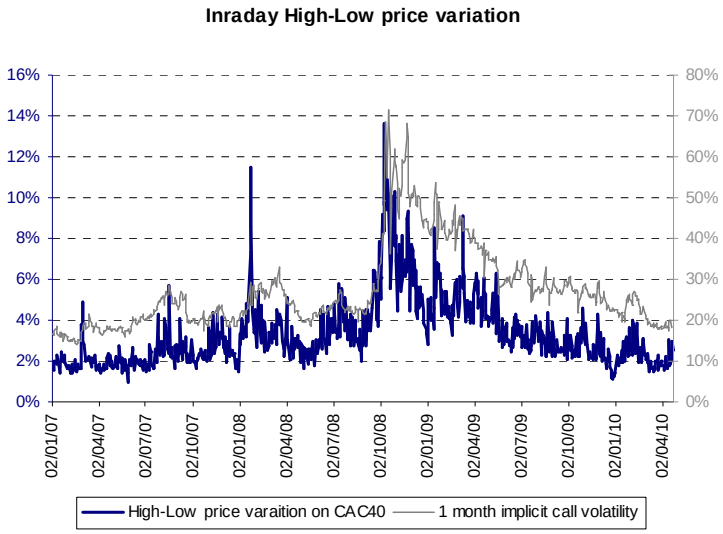


(ii) Intraday volatility: measured by either the high/low price variation during the day and the standard deviation of the high/low price variation on a 5 minutes basis.

Looking at the daily high-low price variation since 2007, we also do not see evidence of structural changes following the development of HFT. This variable is

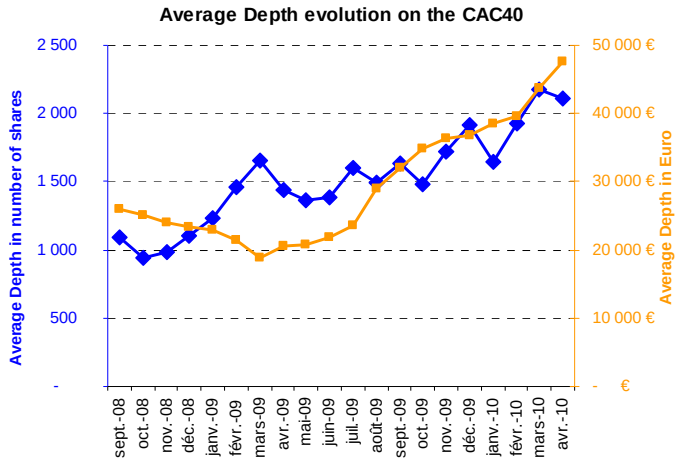
[3] This is in line with a recent report from SIRCA on "market quality and the trend towards algorithmic trading" published in February 2010. The main conclusion was that the increase in HFT on the Australian market has not had impact negative impact on the liquidity and the integrity of the local equity market.

still highly correlated to macro-economic variables. For example, the strong peak in January 2008 occurred on the day when a large French bank announced losses. The 5 minute based intraday volatility between high-low price is also stable over the same period, so we do not see any evidence of short-term price volatility increases. For example, in March 2010, the 5 minute based volatility was at its lowest: 0.10% compared to historical average at 0.14% on the Euronext 100 component securities.



(iii) Disclosed volume: either at the best limit or in terms of market impact to trade a size normalised at €500,000.

With regard to market depth, we observe a significant increase of the available quantity at best limit on the NYSE Euronext order book. At first sight, this may appear counter-intuitive given the decreasing average trade size. First, the average depth on the CAC40 component securities increased from 25,000 euros in September 2008 to 47,000 euros in April 2010, which is soley due to a volume effect, as the average share price decreased by 16% over the same period. In reality, the market depth in number of share has doubled since September 2008 and is at its highest historical level since 2007.



This market depth increase may be explained by the clustering effect of several orders at the best limit. Each individual order has a smaller size, but we have a greater number of orders for each price limit. Overall, this results in an increase of the market depth at touch. This is even more true when observing the market impact (i.e. the cost to trade compared to the mid-point) for a larger standardised trade size of €500,000: the market impact for these trades fell from 10 basis points before the financial crisis to below 6 basis points in March/April 2010.

In conclusion, we do not see evidence of an adverse impact of HFT (or algo-trading more broadly) on the NYSE Euronext order book. Market spread and intraday volatility are still mainly driven by macro-economic indicators and are currently at historical lows. Market depth has significantly increased compared to the start of 2007 (pre-crisis). This runs counter to the argument that liquidity has dried up on lit order books, forcing participants to trade on dark books. In short:

- The order book is more dynamic and probably more efficient than before, thus forcing some market participants to revise their trading techniques;
- The decrease in the average trade size on NYSE Euronext is probably less due to HFT and more a consequence of greater execution quality monitoring from investors using VWAP as a benchmark. Furthermore, this trend in trade size should not be seen as a liquidity contraction because the order book is deeper than ever and market impact is at its lowest.

5. What are the key benefits from HFT? Do these benefits exist for all HFT trading strategies?

See previous questions.

6. Do you consider that HFT poses a risk to markets (e.g. from an operational or systemic perspective)? In your view, are these risks adequately mitigated?

In the view of NYSE Euronext, HFT does not pose any specific risks. The implementation of systematic investment methods to capture short-term alpha and its resulting speed of execution do not amplify any of the existing risks. This is particularly true for those trading venues with high standards of market surveillance and with a strong diversity of order flows, including competition between several HFT flows.

HFT does not pose any specific risks of market abuse, price manipulation, front running or order book layering as long as it is properly monitored. It is simply a matter of having an adapted market surveillance function that can monitor as fast and as smart as HFT firms trade.

One area regulators may wish to study is the potential for systemic risk when a trading venue is not sufficiently "multi-lateral":

- If a platform relies on a single source of liquidity for 30 to 50% of its activity, other investors may be placed at risk should that firm cease its activity or change its trading strategies.
- Where there is no CCP for these trades, the risk resides with the counter party.

In a similar vein, regulators should be vigilant to any "privatisation" of flows between HFT firms and providers of retail flow, which is passive and relatively uninformed. Recent developments in the Dutch market could be repeated across Europe and are not in the interests of the wider market.

7. Overall, do you consider HFT to be beneficial or detrimental to the markets? Please elaborate.

Overall, NYSE Euronext believes that HFT has been beneficial to the market. They are market neutral and not pro-cyclical: the diversity of their strategies means that market trends are not exaggerated. They are as much liquidity maker as liquidity taker, thus participating in several forms of liquidity provision and price discovery. They are supporters of market transparency and a force for cost reductions in the value chain.

8. How do you see HFT developing in Europe?

HFT is likely to grow in the coming years, but will reach a natural limit as outlined in question 3.

9. Do you consider that additional regulation may be desirable in relation to HF trading/ traders? If so, what kind of regulation would be suitable to address which risks?

Based on all these considerations, NYSE Euronext strongly feels that HFT provides value to the market by systematically capturing the short-term alpha. Our only concerns and suggestions are the following:

- HFT, like all other market participants, should be properly monitored *between* all trading venues and regulators should be equipped with tools adapted to their speed of execution and the diversity of their strategies;
- Given the current debate and lack of understanding around HFT, regulators could better identify and track the volumes of HFT volumes by implementing a system to identify this flow. This would evidently be on the condition that the anonymity of HFT flow is guarded.
- To ensure that all the financial ecosystem is educated on the changes brought about by this new trading activity that make the order book more dynamic;
- To implement on a *coordinated European level* some market design limitations in order to ensure the highest level of liquidity and integrity across exchanges, MTFs and crossing networks. Examples for consideration are:
    - Monitoring that current industry initiatives around tick-size harmonisation measures are performing satisfactorily;
    - Harmonising time-stamps across platforms to allow for a proper cross-platform surveillance, and define a time-stamp format on a micro-second basis;
    - Implementing standardized circuit breakers, prohibiting wash-trades (i.e. the same market participant trading against himself for his own account, artificially inflating trading volumes), and defining standard trade cancellation mechanisms;
    - Once a platform is mature enough, implementing limits on the percentage of a platform's flow that can come from a single firm;
    - Ensuring fair access to market and market data;
    - Limiting the potential for conflicts of interest, for example, by obliging shareholders to publicly disclose on a monthly basis the volumes sent to the platform of which they are a shareholder, or by limiting the combined ownership of market participants in a platform to below 50%.

Harmonising at European level and upgrading regulators' surveillance systems may require changes in how regulators are funded, with a more even distribution of the burden across all trading platforms, be they exchanges or MTFs.

II. Sponsored access

1. What are the benefits of SA arrangements for trading platforms, sponsoring firms, their clients and the wider market?

Trading platforms obviously prefer its clients to hold direct memberships, but sponsored access is a valuable means to bring smaller more focused firms closer to financial markets. It may otherwise not be cost effective for these firms to maintain the legal, IT and post trade costs of direct membership.

(i) Benefits for trading platforms

By offering sponsored access, the trading platform forms a closer relationship with clients behind its direct user firms. The platform may otherwise not have a relationship with these players, who are often smaller, more focused entities. At NYSE Euronext, the technological set-up of sponsored access means that activity of the sponsored firm is identified in the platform's system via a unique trading code. The mechanism therefore enables closer monitoring from the trading platform / regulators and enables intervention by these bodies in the sponsored party's order flow in real time.

(ii) Benefits for sponsoring clients

Sponsored Access enables broker/dealers to broaden their horizon in terms of potential clients and to improve their service to existing clients. The target clients are those that are particularly sensitive to latency and infrastructure costs, and who lack the scale to maintain a full exchange/MTF membership. By offering sponsored access, the sponsoring client retains its business relationship with sponsored clients, who may otherwise have considered direct membership of the platform.

(iii) Benefits for clients of sponsoring firms

Sponsored participants are typically smaller firms, for whom latency is key, and who do not have the scale in terms of technology, back office processing and risk management to become full members of the exchanges or MTFs. Sponsored Access offers firms faster access to the market, while still allowing them to benefit from a range of related services, in particular post trade management, offered by the sponsoring firm. In addition, the technical set up for Sponsored Access can be outsourced by the sponsoring firm to a technology company specialising in offering this type of access ensuring state-of-the-art service for the trading firms; this is third party Sponsored Access.

Where a trading platform provides discounts for high volume traders, the sponsored participant may be able to benefit from lower marginal fees if its volumes are aggregated with those of the sponsoring firm.

Another key aspect is the anonymity delivered to the transactions routed through the sponsoring firm. While still having control over the order flow emanating from their clients, the sponsoring firm does not have access to information enabling them to reconstruct their clients' trading strategy and patterns. Even though from a regulatory point of view, a broker/dealer may not use this information, due to the risk of front running for example, this guaranteed anonymity offers the sponsored trading firm greater comfort.

(iv) Benefits for the wider market

While Exchanges and MTFs naturally favour direct memberships over sponsored accesses, we recognise that Sponsored Access brings new sources of liquidity to the market (see above). Sponsored Access is a competitive alternative to Direct Market Access; it therefore contributes to building a competitive environment, ultimately helping lower trading costs for market participants. Nevertheless, the existence of a risk management layer will continue to impose some additional latency.

2. What risks does SA pose for the orderly functioning of organised trading platforms? How could these risks be mitigated?

(i) Risks for the orderly functioning of organized trading platforms

NYSE Euronext has not identified any increased risk from Sponsored Access compared to Direct Market Access, provided that the adequate pre-trade risk arrangements are in place between the sponsored and sponsoring parties. Indeed, where the platform identifies the sponsored party with a trading code, Sponsored Access could be considered superior to Direct Market Access.

The risks typically identified in Sponsored Access are "fat finger" issues, where either a human or a trading system error leads to an order being sent to the trading platform without a need or an instruction to do so. These "fat finger" trades are easily recognizable by Risk Management systems.

A further risk is when trading firms engage in overall positions that exceed their overall exposure allowance. Again, the overall position size is easily managed by Risk Management systems at the time of order entry.

The absence of such Risk Management filters ("naked" sponsored access) would impose unacceptable risks to the market. NYSE Euronext believes that pre-trade risk filters managed

by the sponsoring firm are essential to manage market risk. Certain players contend that a combination of checks at the exchange level and post trade drop copies is sufficient to manage the risk exposure of the sponsored firm. NYSE Euronext firmly believes that such arrangements are inadequate. Furthermore, some sponsored players contend that the addition of pre-trade filters add latency to the orders of the sponsored client and places them at a disadvantage. In these cases, the sponsored client should obtain direct membership of the exchange or MTF. Risk management systems do impose some latency due to their internal processing time, but such risk tools are also part of a very competitive environment, which is delivering efficient solutions.

(ii) How could these risks be mitigated?

Sponsored Access firms must have a pre-trade Risk Management system in place. The Risk Management system should offer the sponsoring firm adequate controls over the trading firms' access to the market without divulging any of the actual trading patterns of their client. The Risk Management system may be provided to the sponsored firm by the trading platform, but can also be offered by a third party. In the latter case, the trading platform should audit the Risk Management system in order to ensure that it offers a minimum service level equivalent to that offered by the platform's own Risk Management system.

Furthermore, sponsoring members should have the ability to immediately halt all sending of orders from the sponsored firm and effectively shut down trading. This is not the case for "naked" access. Sponsored access coupled with an adequate Risk Management system enables the platform to maintain a relationship with the broker/dealer community without infringing on the integrity of the broker/dealer community relationship with their buy-side clients.

Finally, the trades of the sponsored party should be clearly identifiable to the execution venue through a separate trading member identification.

3. What risks does SA pose for sponsoring firms? How should these risks be mitigated?

"Know your client" rules already ensure that firms hold detailed information about the risk tolerances and financial positions of their clients. The sponsoring firm is legally responsible for the trading behaviour of the sponsored firm. The risks for sponsoring firms cover the same areas as those for sponsored firm. Trading errors on the part of the sponsored party could have negative impact on the capital of the broker, with the potential for wider systemic risks. The implementation of appropriate pre trade risk management tools and the measures outlined below would mitigate any risks.

4. Is there a need for additional regulatory requirements for sponsored access, for example:

a. limitations on who can be a sponsoring firm;

A sponsoring firm must be a member of the platform and demonstrate the necessary and adequate contractual evidence of its relationship with the sponsored trading firm, including its ability to control the trading firm's exposure to the market.

In addition to risk filters, the regulators should ensure that the sponsoring firm has a sufficiently robust balance sheet, clearing arrangements, technical and human capability to manage the risk exposure of the sponsored firm.

The Exchange or trading venue has to have the right to audit whether the sponsored client's set up is in compliance with the Sponsored Access contract even thought this is a bilateral contract between the sponsoring firm and the sponsored client. Ultimately the responsibility for all trades entered using Sponsored Access lies with the sponsoring firms.

b. restrictions on clients that can use sponsored access;

The relationship between the sponsored firm and the Exchange is not a direct one; it is therefore up to the sponsoring firm to establish that the minimum Risk Management systems are in place in order to mitigate the risk the sponsoring firm takes with its client when opening up a Sponsored Access link.

As mentioned above, the benefits of sponsored access concern primarily smaller players. NYSE Euronext considers that direct membership is preferable to sponsored access, but that the benefits of bringing smaller players closer to the market outweigh such concerns (provided pre-trade risk tools are in place). However, we do not believe that sponsored access should become a widespread solution for larger players who have the capability to become direct members of platforms.

c. additional market monitoring requirements;

We cannot identify any reason to expect greater opportunities or situations for trading firms to engage in market manipulation or abuse. No additional market monitoring requirements should be imposed other than the Risk Management layer.

d. pre-trade filters and controls on submitted orders.

NYSE Euronext believes that pre-trade filters and controls should be imposed on submitted orders in order to verify that the order that is about to be sent to the market does not display (i) any signs of being outside the normal trading patterns of the trading firm and (ii) will not lead

to an exposure that is beyond the position limits imposed to that trading firm. These controls should remain under the responsibility of the sponsoring firm, since the broker is best placed to have a view of the client's entire trading activities. Market participants must continue to monitor systemic risks of their clients.

5. Are there other market wide implications resulting from the development of SA?

Provided that (i) pre-trade risk filters are in place and (ii) sponsored access remains a means for small, not large, players to access the market, we believe that Sponsored Access provides a valuable service bringing a wider variety of participants closer to the point of price formation.

III. Co-location

1. What are the benefits of co-location services for organised trading platforms, trading participants and clients/investors?

(i) Organised trading platforms

By offering co-location, trading platforms can earn revenues from the provision of co-location services. Furthermore, the reduced latency that co-location offers brings new types of trading, promoting the diversity of the liquidity pools on our market and thereby contributing to price stability. In a competitive environment, exchanges and trading venues that offer co-location services are at a competitive advantage versus other venues that do not offer this service.

(ii) Trading participants

Co-location enables trading venues and Exchange to offer competitive latency performances to their clients. Our data centres are built in such a way that they will be able to accommodate growth in the market, avoid any future potential pressure for differential treatment of clients. In the initial adoption of any innovation, such as co-location, some players are faster to market. However, now independent software vendors are offering co-location services providing smaller trading firms with the same proximity as larger firms.

(iii) Clients/investors

Clients who are not latency sensitive will benefit from the increased liquidity driven from some of the co-located clients' activity, without bearing any type of burden from the fact that there activity is processed at a slower pace than that of the co-located clients.

2. Are there any downsides arising from the provision of co-location services? If yes, please describe them.

We do not see any downside to offering co-location services so long as the access to these services are equal and fair to all market participants. This is the responsibility of the firm (which may or may not be an exchange) offering the service.

3. What impact do co-location services have on trading platforms, participants, and the wider market?

See questions 1 and 2.

4. Does the latency benefit for firms using co-location services create any issues for the fairness and efficiency of markets?

No. We ensure that all co-located clients benefit from the same latency regardless of where their racks are positioned in our data centres. Latency control systems are in place to ensure that all co-located clients are treated fairly within the data centre. Smaller firms who would not be able to justify co-location from a financial point of view are also able to benefit from co-location services as the data centres are open to all clients, including Independent Software Vendors who can then sell on the service to their clients.

It is interesting to note that throughout recent financial market history, latency sensitive clients have pursued aggressive strategies to geographically position their servers close to the platform's data centre. Co-location simplifies the process and as such brings greater fairness to the market, by placing these clients at an equally close distance from the matching engine.

5. In your view, do co-location services create an issue with the MiFID obligations on trading platforms to provide for fair access?

No answer, see question 4.

6. Do you see a need for regulatory action regarding any participants involved in co-location, i.e. firms using this service, markets providing the service and IT providers? Please elaborate.

We do not see any need for regulatory action regarding participants involved in co-location other than ensuring that platforms provide fair access to these services. Connectivity to trading venues is dependent on the type of trading/investment strategy used by the member firm and its clients. Clients who are not latency sensitive will simply benefit from the increased liquidity driven from some of the co-located clients' activity without bearing any type of burden from the fact that there activity is processed at a slower pace than that of the co-located clients. The choice to be co-located should remain with the market participant.

Not only exchanges provide co-location services. Any regulation applied to exchange owned facilities should equally be applied to non-exchanged owned facilities.

IV. Fee structure

1. Please describe the key developments in fee structures used by trading platforms in Europe.

(i) Execution fees have fallen on platforms.

From the point of view of the end investor, the providers of market infrastructure (platforms, CCPs, CSDs) are only part of the trading value chain. According to the European Commission's report on trading costs, undertaken by Oxera in 2009, over 90% of the costs for the investor lie with intermediaries and custodians, with less than 10% shared between market infrastructure providers.

Under competitive pressure from MTFs, regulated markets, such as NYSE Euronext, have implemented significant fee reductions since the implementation of MiFID. However, as Oxera and other analysts note, there is no evidence that fee reductions at the end of the value chain have been passed on to the end retail investor.

(ii) New matching venues have introduced fee-related incentives to attract order flow.

In a competitive market it is natural for new platforms to seek to attract liquidity away from incumbents by offering incentives. Three main fee-related methods have emerged.

a. *Maker-taker schemes.* These schemes encourage the posting of orders in lit order books. Traders who post orders are rewarded with payments ("maker" rebate) for each order that is lifted. On the other hand, the traders who lift these orders typically pay the platform a "taker" fee. The taker fee is typically higher than the payment to the maker and the trading platform earns the difference. Maker-taker schemes have been adopted by almost all the pan-European MTFs to attract liquidity. Often the platform will "invert" the maker taker fee, i.e., the fee charged to the taker is lower than the payment to the maker. This means that the platform loses money on every trade.

b. *Jump-ball programmes.* Some MTFs have remunerated providers of order flow with shares in the platform based on the level of volumes provided by the member.

c. *Rebating a portion of the spread.* The MTF charges a fee in basis points and then pays back to the client 25% of the spread if the order is passive.

(iii) MTF fees are discounted to incumbents, reflecting a very different business model.

The competitive environment since November 2007 has proven to be highly path-dependent on the pricing decisions of the early movers in the MTF space. The first MTF to enter the market implemented a maker-taker fee, where traders who post liquidity in the order book receive 0.2 basis points and traders who lift the posted orders are charged 0.3 basis points. In this case, the MTF earns the difference, that is, 0.1 basis points on the value traded (or the equivalent of 0.05 basis points per side of the transaction). Most lit MTFs which subsequently entered the market in 2008 priced at identical or at very similar rates. Other MTFs do not explicitly operate maker taker fees, but still reward providers of liquidity in some way.

The revenues generated by this pricing model are modest. To give an order of magnitude, based on recent volume figures for CESR liquid stocks (say €30-35bn per day), an MTF netting 0.1 bps with a 5% market share would generate around €3-5 million per annum, and 15% market share would generate €10-15 million. It should be borne in mind that volumes in the European market are far smaller than in the US market, where an equivalent market share can generate significantly higher revenues.

Given (i) the level of volumes in Europe vs the US and (ii) the fact that trading platforms remain largely fixed cost businesses, it would appear that there is no business case for a pan-European MTF at these prices. This is in spite of the fact that MTFs have lower cost bases than exchanges, that is, they do not bear all the costs of running a regulated market (regulatory fees, processing corporate actions, providing listing services, maintaining small caps, etc). However, MTFs have developed very different business models to the main European exchanges, which are largely for profit companies with diverse shareholder bases. The user-shareholders of MTFs recoup their investments in other ways, such as earning maker rebates or in the form of lower fees on regulated markets (gained as a result of greater competition).

Beyond business model considerations, regulators should be concerned whether the revenues are enough to cover the costs of market surveillance. This is particularly important when a platform has a large market share.

2. What are the benefits of any fee structures that you are aware of?

There is a diversity of trading fee structures in the market and each has their relative merits and impact on market behaviour. On balance, NYSE Euronext believes that in a competitive market, this diversity is healthy.

Maker taker schemes have been central to creating a more competitive environment between execution platforms. Without paying maker rebates in their early stages, it is doubtful whether some of the successful MTFs would have been able to get off the ground and propose

viable alternatives to regulated markets. Maker taker pricing has also been helpful in bringing new flows to the market by making profitable trading strategies that were previously unprofitable.

The benefits of other fee schemes are outlined below

Fee scheme features	*Benefits*
Basis points	Intermediaries charge their clients usually in basis points (albeit in bundled services). Many intermediaries favour basis point fees because they are relatively easy to predict, can be easily programmed into order routing algorithms and are more in line with client invoicing.
€ fee per trade	Fee per trade has fallen out of favour as falling trade sizes meant that the same value was being executed in a larger number of trades, placing an upward pressure on fees and creating unpredictability.
€ fee per order	Above a certain threshold, orders are sometimes charged by trading venues as a disincentive to certain players, who may otherwise flood the trading engine with orders (which are later cancelled), slowing down the system to the detriment of other users.
€ fee per executed order	Only those orders that are executed are charged. This encourages users to place larger orders in the book, which is beneficial for the liquidity of the platform.
Volume discounts	Larger clients are rewarded with lower marginal fees.

3. Are there any downsides to current fee structures and the maker/taker fee structure in particular? If yes, please describe them.

NYSE Euronext believes that the maker-taker model has been successful in attracting liquidity to new platforms, thereby promoting competition between venues. However, beyond a certain level of market share, these benefits from greater competition begin to be outweighed by the potential costs and distortions:

- Differences in maker rebates and taker fees between platforms create the potential for distortions in market behaviour as some players seek to earn the maximum net rebate across platforms. For example, if a trader wishes to be flat at the end of the day, he will "take" on the platform with the lowest taker fee and hedge by "making" on the platform with the highest maker rebate, or across multiple platforms, thereby promoting fragmentation.

- Brokers have an incentive to route their orders to the platform that pays the highest rebate. This may create a conflict of interest without regard to market quality. In turn, there is little incentive for intermediaries to pass back to their clients the maker rebate that the trader has earned by placing the order on a maker-taker platform.

- To avoid becoming involved in a maker-taker escalation (paying the highest maker rebates and charging the lowest taker fees), MTFs have effectively competed against each other by introducing jump-ball programmes, where volume providers are rewarded with shares in the platform. The basis for differentiation between competing MTFs has effectively become their shareholder base. This incenting of order flow with shares has the potential to create conflicts of interest when trading firms choose which platforms to connect to and where to route orders. There would be potential for conflicts of interest when a platform is investigating a breach of market rules of one of its main shareholders.

Irrespective of the issues around platforms paying for order flow, there is the issue of platform being run at losses and whether this is in the long term interests of the market. At risk is the investors' experience of liquidity, for which the traditional exchange link between capital raising and price formation is weakened.

4. What are the impacts of current fee structures on trading platforms, participants, their trading strategies and the wider market and its efficiency?

Under pressure from MTFs, incumbent exchanges have reduced fees, reducing their revenues from blue-chip trading. Fees from this segment have traditionally been at the core of exchanges' business models in Europe. However, these business models are being called into question, since, unlike MTFs, regulated markets perform many additional functions due to their traditional role at the centre of capital markets. These functions are a source of great value to the wider market, but are often a source of cost or very low margins to the regulated market. They include admission to listing, processing corporate actions, maintaining state-of-the art market surveillance and disaster recovery arrangements, in addition to providing a capital market for large numbers of SMEs that are not heavily traded.

5. How important is the fee structure of a trading platform in determining whether to connect or not to it for trading. Please elaborate.

The role of fee structures, independently of the fee level, depends on *who* is connecting. The biggest incentive to connect out of any of the fee schemes is contained in the maker-taker structure, in particular the potential to earn maker rebates. However, only certain types of player have the ability to post large numbers of orders. These players are the electronic

liquidity providers, who specialise having the lowest latency and in being able to post and cancel orders faster than other players.

Irrespective of the fee structure, if a trading firm is also a shareholder of the platform, it will have an obvious incentive to connect to the platform. All of the non-exchange owned MTFs have majority owned by trading firms. Even exchange owned MTFs find it beneficial to the platform to have trading firms in the capital, for example the LSE's Turquoise, or NYSE Euronext's MTFs SmartPool and Secfinex.

6. Do you consider that the fee structures of trading platforms should be made public to all market participants? Please provide a rationale for your answer.

Providers of market infrastructure (exchanges, CCPs and CSDs) are signatories to the Code of Conduct make public their trading fees. There is no need for further regulation here. However, as the Commission's study on fees highlighted, only 10% of costs for the investor are located with the exchanges, CCPs and CSDs. The focus on transparency should turn the rest of the value chain.

The terms of liquidity provision agreements between platforms and market participants should be made fully public.

7. Is there a role for regulators to play in the fee structures? If yes, please describe it.

Competition on fee levels and structures is part of a healthy, competitive market.

Regulatory intervention should be limited to ensuring that fee arrangements do not create conflicts of interest leading to distortions in market behaviour.

Even the *perception* of conflicts of interest can be damaging to the market. Where users are substantial shareholders of platforms, regulators should consider:

- Greater transparency and disclosure: for example making public liquidity provision arrangements with shareholders, or obliging owners to publish the volumes routed to the platform on a monthly basis, or
- Limits on ownership by participants, to a minority shareholding.

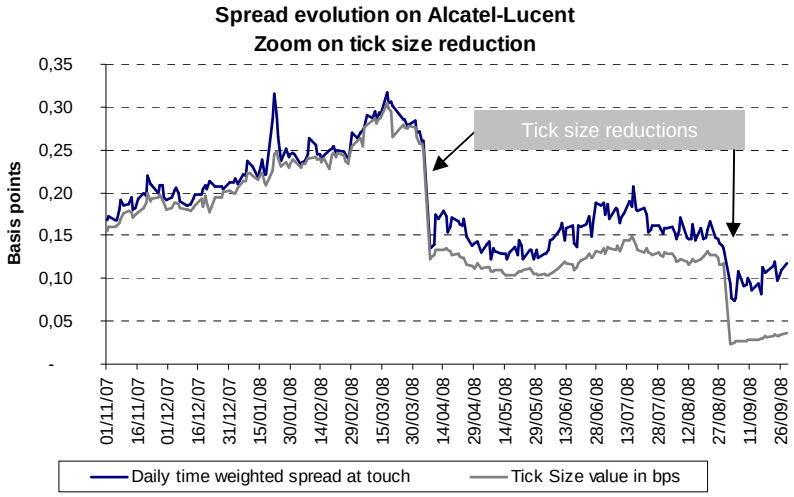
V. Tick size

1. In your view, what has been the impact of smaller tick sizes for equities in Europe on the bid-ask spreads, liquidity, market depth and volatility of these markets? Are there any spill-over effects on derivatives markets?

The impact of smaller tick sizes is well documented. Bid-ask spreads have fallen, lowering the implicit costs of trading. Issues around market depth and volatility are dealt with in question 1.

2. What are the benefits/downsides of smaller tick size regimes for shares in Europe?

The potential benefits depend on the liquidity characteristics of the specific stock in question. If a stock is initially constrained in terms of liquidity by tick sizes, then a tick size reduction will significantly reduce spreads and the volume weighted average spreads for a standardised quantity, thus reducing the implicit cost of trading and offering new trading opportunities. If the liquidity is already weak, then a further tick size reduction will distribute the same quantity over a larger number of different prices, thus further reducing liquidity and trading opportunities. An example of a successful tick-size reduction is provided below.



The observed relative spread on Alcatel-Lucent was constrained by the tick size at the end of 2007 and beginning of 2008. As we can see on the graph, more than 90% of the day the spread was equal to 1 tick, thus further price improvement was not possible. This has three main consequences:

- Clients coming to NYSE Euronext trade with a spread artificially wider (up to 0.30 bps) than what it could be (historical level of 0.10 bps) thus increasing the implicit cost of trading;

- The accumulation of orders at the same price limits was so important that the waiting list restricts the number of executions because market participants prefer to wait than pay 0.3 bps in spread;
- Off-exchange business grows as it becomes very easy and profitable to cross client orders outside of the lit book with a spread of 0.25 bps thus providing slight price improvement and increasing the intermediary's margin.

When NYSE Euronext made a first tick size reduction to €0.05, the spread immediately fell from 0.30 bps to 0.15 bps. However, it still remained significantly constrained, as more than 80% of the time, the spread was equal to €0.05. This led to the decision to make a second tick size reduction to €0.01 that allowed the spread to revert back to the historical level at around 0.10 bps.

This example illustrates that the tick size should be (i) dynamic, i.e. related to the price of the stock and (ii) aligned with the liquidity level of the stock.

3. Is there a need for greater harmonisation of tick size regimes across Europe? Please elaborate.

We should avoid a race to next decimal place and it is crucial that tick sizes be harmonised across venues. In 2009, the main MTFs and the Federation of European Securities agreed on a standard tick-size table. As long as the main execution venues continue to coordinate with each other, there is no need for greater harmonisation.

4. Is there a role for regulators to play in the standardisation of tick size regimes or should this be left to market forces?

Market forces have so far proven capable of standardising tick size regimes.

5. Have organised markets developed an appropriate approach to tick sizes?

Yes. NYSE Euronext, Deutsche Börse, academic researchers and market practitioners have created an effective methodology to assess, in terms of spread, how much of a constraint the tick size is (see question 2). This methodology has been used in recent years to adapt our tick sizes to the maturity of the liquidity on our regulated markets. The technique also formed the basis for the FESE harmonisation process with MTFs. We wish to avoid the negative experience of "penny jumping" in the US few years ago.

6. Should regulators monitor compliance with the self-regulatory initiative of the MTFs and FESE? If this initiative fails, do you see a need for regulators to intervene?

This industry lead initiative is a very positive one. Regulators should continue monitor its effectiveness and only intervene if the current arrangements break down.

7. What principles should determine optimal tick sizes?

See above.

VI. Indications of Interest (IOIs)

1. Please provide further information on how IOIs are currently used in European markets by investment firms, MTFs and RMs?

In the best case scenario, IOIs are used as non-actionable liquidity alerts, which are delivered by Investment banks on a one to one and a one to many basis. The quality of the IOI is variable, in that they are sometimes merely adverts and sometimes they represent real liquidity. Clients have developed tools through their OMS systems and IOInet etc, to be able to filter the IOIs for quality. Some MTFs (particularly dark pools) use a form of IOI as a way to route liquidity between each other. Some regulated markets have functionality available to provide "addressed offers" which are a form of IOI. They are rarely used.

In some other cases, they are used to circumvent MiFID transparency rules and non-discretionary access. In that respect, they are *actionable*, meaning that one can trade directly by clicking on the IOI which is in fact a real order.

2. Which are the key benefits/downsides of such IOIs? Please provide evidence to support your views.

Benefits: as long as IOIs are (i) appropriately managed, that is non-actionable, and (ii) used for large size orders, they clearly contribute to size discovery, thus participating in the effort to minimise information leakage for large orders. They contribute to an effective search for counterparties, with limited impact on price. This cannot be achieved on lit book.

Downsides: the trader may be unable to "see the wood for the trees" and it may be difficult to ascertain quality, with a risk of "fishing". The absence of limitation to the non-discretionary access could potentially raises questions about privileged information.

3. Do you consider that MiFID should be amended to clarify that actionable IOIs should be subject to pre-trade transparency requirements?

There is still a process of telephone / electronic negotiation in Europe on the back of an IOI. Even though we do not have immediately actionable IOIs on equities in Europe so far, we should heed the example of other asset classes and markets to strictly forbid IOIs without any pre-trade transparency rules. An immediately executable IOI is for all intents and purposes an *order* and so should conform to the pre-trade transparency requirements and non-discretionary access rules.

To avoid any risk of misused regulation, it should be clear that non-actionable IOIs need to be restricted to large trades, thus conforming to the transparency size waiver.

4. Do you see circumstances where it would be appropriate for IOIs to be provided to a selected group of market participants? Please provide evidence/examples to support your views.

A broker should always target IOIs to its selected customers, as long as the IOIs are not immediately executable.