

# MiFID: the (in)famous European Directive?

March 2007



**Catherine D'Hondt**  
Associate Professor, EDHEC Business School

**Jean-René Giraud**  
Director of Development and Research Associate with  
the EDHEC Risk and Asset Management Research Centre

## Abstract

MiFID (The Markets in Financial Instruments Directive) is probably one of the most significant regulatory initiatives that is about to transform the European Capital Markets. Far from the predictions of some scaremongering commentators that a collapse of the industry is the only outcome, MiFID is in fact providing a unique harmonized framework for execution services across Europe.

The long-term implication of MiFID is undoubtedly the complete desegregation of the existing value chain related to execution services, which is not free of risks for the quality of services provided to clients and the financial market structure itself. Although the Directive provides several responses to both risks, some may not be as effective as they should.

First, by restricting harmonised pre-trade transparency requirements for systematic internalizers to the most liquid equities only, MiFID leaves room for the development of possibly opaque liquidity pools for non-liquid equities and other financial instruments. We show in this paper that the regulator has just waived the pre-trade transparency obligation where it is probably the most necessary, and that, because of increased fragmentation and less transparency, trading on illiquid stocks post-MiFID may well be even more costly than it is today. If fragmentation is a good thing for ensuring proper competition and force execution fees down, its impact on total transaction costs that depend upon the efficiency of the market structure is yet to be seen.

Second, the best execution obligation, which is a key element for investor protection in a market that is open to competition, has resulted in a modest obligation of means that remains complex and ambiguous. With such a provision, there is little chance of the industry embracing the concept and actually delivering upon the Directive's promises.

This paper is a call for the industry to seriously embrace a reflexion on how the quality of service is and should be measured in order to adequately protect the end investor in a context where a deliberate fragmentation of supply might not be counter balanced by adequate measures.

## About the Authors

**Catherine D'Hondt** has been a full-time Professor of Finance at EDHEC since September 2004. Her primary research area is market microstructure, with a special focus on traders' behavior and order submission strategies. She has the opportunity to present most of her empirical work at several high level international conferences. She is now working on the long-term implications of MiFID (the Markets in Financial Instruments Directive) on the European capital markets industry. Within this project, she is developing expertise in transaction cost analysis and trading performance measurement. She currently teaches in the area of financial markets and assets.

**Jean-René Giraud** is a director of the EDHEC Risk and Asset Management Research Centre, where he is in charge of business development, and a research associate with the research centre, focusing on extreme risks. Prior to joining EDHEC, Jean-René spent several years at various positions within investment banks and management consultancy firms in London. He began his career in Paris, where he supported the development of a software company specialised in portfolio management and led the client advisory activity of the firm. Jean-René has published widely on financial topics and is a frequent speaker at industry and academic conferences on subjects including risk management, alternative investments, market microstructure and market regulation.

# Table of Contents

Executive Summary .....5

Introduction .....7

1. Post-trade transparency obligation.....9

2. Pre-trade transparency obligation..... 11

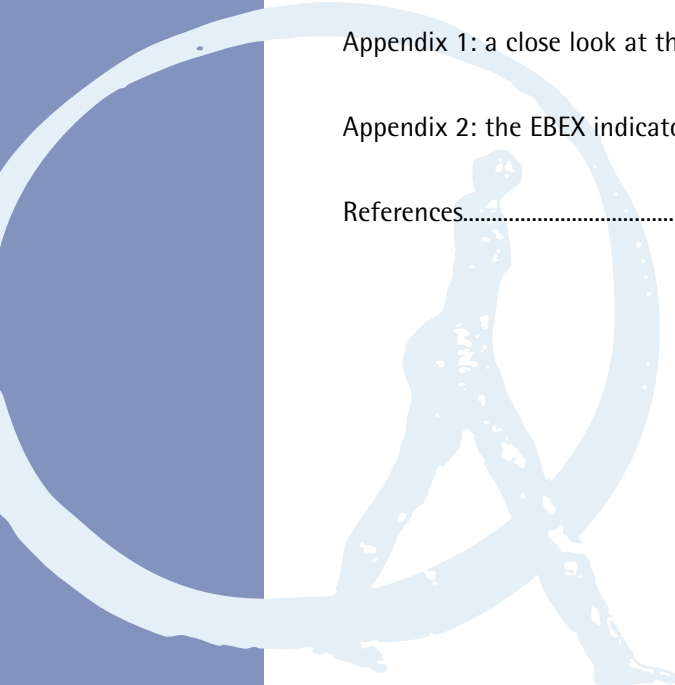
3. Best execution obligation..... 18

Conclusion ..... 22

Appendix 1: a close look at the realities..... 23

Appendix 2: the EBEX indicators..... 25

References..... 29



## Executive Summary

MiFID is the second step in the harmonization of the European capital markets industry and aims to adapt the first Investment Services Directive (ISD 1, issued in 1993) to the realities of the current market structure. Part of the European Financial Services Plan (FSAP), the "MiFID" (Directive 2004/39/EC, formerly known as Investment Services Directive II) was ratified by the European Parliament on April 21<sup>st</sup> 2004. The implementing Directive and Regulation were approved by the Parliament over the summer of 2006 and provide detailed implementation guidelines applicable to all Member States. Local regulators are currently working on the third level of this new regulation, with specific and local implementation measures that will come into force no later than November 2007.

In a nutshell, MiFID sweeps away the very concept of central exchange and obligation of order concentration as it currently exists in several European countries, and recognises the need to include all participants in the execution cycle and all financial instruments under a consistent regulatory framework. It therefore goes far beyond equity markets only and will impact upon all market participants – buy-side, sell-side and trading venues (exchanges). The Directive introduces a passportable operating framework for execution services that can be provided by Regulated Exchanges (RE), Multilateral Trading Facilities (MTF)<sup>1</sup>, or Systematic Internalisers (SI)<sup>2</sup>.

The long-term implication of MiFID is undoubtedly the complete desegregation of the existing value chain related to execution services, owing to the end of monopolistic positions for exchanges, the creation of new opportunities for investment firms, the development of new business models and hopefully cost competition. This desegregation, however, is not free of risks for the quality of services provided to clients and the financial market structure itself. The main risks one ought to consider relate to the integrity of markets (safety of executed trades and efficiency of prices) and the protection

of investors. These are two elements that the regulator should aim to protect in a fully liberalised marketplace.

MiFID provides some responses to both risks. Indeed, the Directive balances the opening of the execution landscape to full competition with a set of obligations that intend to increase transparency and investor protection in order to maintain European markets in a situation where the price discovery mechanism remains efficient and fair and where the markets' overall integrity is guaranteed despite inevitable fragmentation.

More precisely, this set of requirements exhibits three fundamental pillars:

- Post-trade transparency obligation
- Pre-trade transparency obligation
- Best execution obligation

While EDHEC has little concern about the first pillar (imposing stringent harmonized post-trade transparency rules on all execution venues and investment firms is rather a significant breakthrough, as we know that no public reporting currently exists for off-market trades), our main concern is rather about both pre-trade transparency rules and best execution obligation, which run the risk of not being as effective as they should be.

This expected ineffectiveness comes from either a lack of relevance in the way requirements are defined or a lack of accuracy in the way they have to be implemented. On the basis of Level 1 and Level 2 provisions, EDHEC believes that the risk remains high that market fragmentation may result in less efficient markets, thereby adversely affecting the price constitution mechanism, and that investors may feel a sense of confidence in a protection that is actually not there.

Following intense negotiation with industry representatives, the Directive has restricted harmonised pre-trade transparency requirements to the most liquid equities only for investment firms operating systematic internalisation.

1 - Similar to Regulated Exchanges in that they allow clients to enter into negotiations without taking part in a transaction as a counterparty. They include all forms of multilateral negotiations such as order books, block trades, periodic auctions and any other form of mechanism resulting in negotiations to be agreed between two counterparties.

2 - This new regime allows investment firms on an organised, frequent and systematic basis to deal on their own account by executing client orders outside an RE or MTF.

## Executive Summary

Hence, MiFID leaves room for the development of possibly opaque liquidity pools for non-liquid equities and other financial instruments, with little transparency on the order book, if any. More important is the fact that the regulator has just waived the pre-trade transparency obligation where it is probably the most necessary. In this paper, we observe that explicit transaction costs (brokerage fees) on less liquid stocks are nearly double those of liquid stocks. Similarly, we witness implicit costs related to transactions on illiquid stocks (according to the MiFID segmentation of the market) up to six times higher than those for liquid stocks. Because of increased fragmentation and less transparency, trading on illiquid stocks post-MiFID may well be even more costly than it is today. If fragmentation is a good thing for ensuring proper competition and force execution fees down, its impact on total transaction costs that depend upon the efficiency of the market structure is yet to be seen. The confusion that very often exists between transaction costs and fees seems to be there to stay, at the expense of the end investor.

The best execution obligation (article 21) is a key element for investor protection in a market that is open to competition. Initiated as an obligation of result in a principle-based regulatory approach, the best execution obligation has been actively fought by industry representatives and was slowly turned into a more modest obligation of means that remains complex and ambiguous, if not overly prescriptive. With such an unbalanced provision, there is little chance of the industry embracing the concept and actually delivering upon the Directive's promises.

Worse still, with no other definition than an obligation of means (that of clarifying an execution policy, being transparent on that policy and ensuring the policy allows achievement of the best possible result on a consistent basis), MiFID is in fact likely to significantly increase adverse selection and moral hazard. By aiming to strongly protect the end investor in a largely liberalised environment, the European regulator

may well have put itself in a situation where some participants will risk "singeing their wing-feathers" despite being highly confident that the Directive requirements are working in their favour.

Obviously, this opinion should not be read as a death sentence for MiFID, which remains a very welcome initiative, but rather as a strong call to the industry to reinvent itself and develop a proper evaluation framework that will shed some light on the actual quality of the service offered to professional and retail clients.

This paper is a call for the industry to seriously embrace a reflexion on how the quality of service is and should be measured in order to adequately protect the end investor in a context where a deliberate fragmentation of supply might not be counter balanced by adequate protection measures.

## Introduction

MiFID is the second step in the harmonisation of the European capital markets industry and aims to adapt the first Investment Services Directive (ISD 1, issued in 1993) to the realities of the current market structure. Part of the European Financial Services Plan (FSAP), the "MiFID" (Directive 2004/39/EC, formerly known as Investment Services Directive II) was ratified by the European Parliament on April 21<sup>st</sup> 2004. The implementing Directive and Regulation were approved by the Parliament over the summer of 2006 and provide detailed implementation guidelines applicable to all Member States. Local regulators are currently working on the third level of this new regulation, with specific and local implementation measures that will come into force no later than November 2007.

In a nutshell, MiFID sweeps away the very concept of central exchange and obligation of order concentration as it currently exists in several European countries, and recognises the need to include all participants in the execution cycle and all financial instruments under a consistent regulatory framework. It therefore goes far beyond equity markets only and will impact upon all market participants – buy-side, sell-side and trading venues (exchanges). The Directive introduces a passportable operating framework for execution services that can be provided by Regulated Exchanges (RE), Multilateral Trading Facilities (MTF)<sup>3</sup> or Systematic Internalisers (SI)<sup>4</sup>.

After two years of near silence on the topic, MiFID has finally attracted the full attention of the entire industry. In reference, one simply needs to open one's email and count the number of invitations to attend conferences on the topic, as there is not a week that goes by without an event addressing the "key strategic consequences" of MiFID. It is interesting though to note that the focus of the most active industry representatives remains the immediate and short-term operational and technology implications, with very few discussions addressing the more strategic and long-term implications of the Directive. It has to be said that most of

the activity generated around MiFID originates within the major consultancy firms, which have a vested interest in making certain that short-term investments in consultancy, operations and technology remain as intense as possible. Scaremongering and ensuring that budgets allow for external spending is therefore the natural focus of most discussions.

It is, however, a truism to say that MiFID will have short-term impacts. Yes, systems and operations processes will have to be upgraded to factor in the new reporting and operating requirements, both within exchanges and financial institutions, and client handling rules will affect investment firms front-to-back. In fact, these upgrades form a significant part of the ongoing requirement to keep systems and operations up to date with the regulatory environment, and if these investments are analysed separately from the business opportunities and challenges going forward, the conclusion can only be that, yet again, the regulatory red tape will swallow the next three years' profit.

This first analysis led a number of commentators to predict the worst from the implementation of MiFID. "It is coming and there is no escape: a nightmarish, alien creature capable of inflicting a terrible financial sting on all it touches. No, not The Day of the Triffids; this horror story is the Day of the MiFID." (Martin Dickson, *Financial Times*, July 22<sup>th</sup> 2005) is what one could read in the financial press, confirming the fact that, at the very least, MiFID was not a welcome change, and in addition to be a famous piece of regulation, most were considering it as infamous.

Going beyond truisms, however, the impact on the European capital markets industry is in fact extremely far-reaching, probably going even further than what the European Commission initially intended.

The reality is that the long-term implication of MiFID is undoubtedly the complete desegregation of the existing value chain related to execution

3 - Similar to Regulated Exchanges in that they allow clients to enter into negotiations without taking part in a transaction as a counterparty. They include all forms of multilateral negotiations such as order books, block trades, periodic auctions and any other form of mechanism resulting in negotiations to be agreed between two counterparties.

4 - This new regime allows investment firms on an organised, frequent and systematic basis to deal on their own account by executing client orders outside an RE or MTF.

## Introduction

services, owing to the end of monopolistic positions for exchanges.

This desegregation, however, is not free of any risks for the quality of services provided to clients and the financial market structure itself. The main risks one ought to consider relate to the integrity of markets (safety of executed trades and efficiency of prices) and the protection of investors. These are two elements that the regulator should aim at protecting in a fully liberalised marketplace.

MiFID provides responses in part to both risks. The Directive balances the opening of the execution landscape to full competition by a set of obligations that intend to increase transparency and investor protection in order to maintain European markets in a situation where the price discovery mechanism remains efficient and fair and where the markets' overall integrity is guaranteed despite an inevitable fragmentation.

More precisely, this set of requirements exhibits three fundamental pillars:

- Post-trade transparency obligation
- Pre-trade transparency obligation
- Best execution obligation

The intentions of the Directive are clearly to protect the investor and ensure market integrity but the practical implementation details leave significant question marks on the results one can expect from the new rules.

While EDHEC has little concern about the first pillar (imposing stringent harmonised post-trade transparency rules on all execution venues and investment firms is rather a significant breakthrough, as we know that no public reporting currently exists for off-market trades at a pan-European level) our main concern is rather about both pre-trade transparency rules and best execution obligation, which run the risk of not being as effective as they should be.

This expected ineffectiveness comes from either a lack of relevance in the way requirements are defined or a lack of accuracy in the way they have to be implemented. On the basis of Level 1 and Level 2 provisions, EDHEC believes that the risk remains high that market fragmentation may result in less efficient markets, therefore hurting the price constitution mechanism, and that investors may feel a sense of confidence in a protection that is actually not there.

In this paper, EDHEC analyses the three newly introduced obligations, their details and the questions they raise, and attempts to provide some elements of analysis and response. Throughout this analysis, the focus is placed on the probable impacts on the European capital markets industry as well as on end investors.

Finally, because it is our aim to attempt to provide some possible solutions, EDHEC proposes a new framework for advanced transaction cost analysis (TCA), whose role in the industry is set to become essential with the arrival of MiFID. Specifically, we propose an innovative framework, which provides new tools for measuring the quality of a transaction with regard to the price obtained, and then to benchmark the final result with the full universe of transactions reported in the industry.

# 1. Post-trade transparency obligation

Under MiFID, all execution venues (RE, MTF and SI) will be required to operate under comparable reporting constraints that focus on two objectives:

- ensuring appropriate reporting of transactions to the competent authority – for all financial instruments;
- ensuring appropriate dissemination of transactions to market participants – for equities only.

In this section, we will analyse how these new harmonised post-trade transparency rules have been designed and why these rules are expected to be effective overall in ensuring market integrity and investor protection.

## 1) Reporting requirement details

Post-trade transparency rules can be split into two levels: reporting to the competent authority and public reporting to market participants. Both levels are described hereafter.

### a) Reporting to the competent authority

MiFID imposes that all transactions – whatever the financial instrument considered – carried out on an RE or MTF, or internalised, be properly reported to the competent authority in conditions which will allow this authority to proceed with any investigation required to ensure that investment firms “act honestly, fairly and professionally and in a manner that promotes the integrity of the market” (Article 25).

Accordingly, investment firms which execute transactions in any financial instrument admitted to trading on a regulated market will have to:

- report details of such transactions to the competent authority as quickly as possible, and no later than the close of the following working day;
- maintain records of all transactions for a period of at least five years and keep them at the disposal of the competent authority;
- make information available both to the host

Member State and home Member State, unless the home Member State explicitly requires this information not to be transmitted.

### b) Public reporting to market participants – equities only

MiFID harmonises post-trade transparency for RE, MTF and SI. Whatever the execution venue, there will be an obligation to publish all trades as close to real-time as possible. For each transaction, the following elements have to be made available to the public: execution venue identification, instrument identification, date and time of the trade, quantity and price per share. Delayed publication, however, is allowed for large trades.

The Directive is not prescriptive on how the information should be made available but stipulates that information could be disclosed:

- through the facilities of any regulated market which has admitted the instrument in question to trading or through the facilities of an MTF in which the share in question is traded;
- through the office of a third party;
- through proprietary arrangements.

Nevertheless, the Level 2 Implementing Regulation further clarifies that any arrangement to make information public shall satisfy the following conditions:

- it must include all reasonable steps necessary to ensure that the information to be published is reliable, monitored continuously for errors and corrected as soon as errors are detected;
- it must facilitate the consolidation of the data with similar data from other sources;
- it must make the information available to the public on a non-discretionary commercial basis at a reasonable cost.

## 2) Contribution to market integrity and investor protection

Stringent harmonised rules for trade reporting to the competent authority will undeniably contribute to ensuring market integrity, as

## 1. Post-trade transparency obligation

they will allow for investigations into market practices.

The Directive even brings a valuable improvement by setting up cooperation between Member States to ensure smooth collaboration and adequate transparency in relation to information collected when required for investigation purposes.

It is however damaging at this stage that the European Commission has not taken the opportunity to impose central coordination of the collection of transaction information. This would have benefited both investment firms and competent authorities in the following ways:

- provision of a single point of reporting, resulting in less complex inter-state transmissions;
- provision of an overall view of transactions carried out within all Member States, thereby allowing for more efficient investigation of and higher transparency in the functioning of European markets.

From the point of view of public trade reporting, the merit of MiFID is to ensure that transactions on equities executed off-market (on MTF, OTC or internalised) will be reported to market participants in order to allow them to be informed about the state of the entire market.

As confirmed by extensive academic literature, it is a recognised fact that being able, in a fragmented marketplace, to easily determine market conditions in each liquidity pool is a *sine qua non* condition for ensuring that the market functions well and prices remain efficient.

Harmonised post-trade transparency requirements, which represent a significant breakthrough, as we know that no uniform public reporting currently exists for OTC trades, are likely to contribute to avoiding competition advantages and maximising price efficiency across liquidity pools. Furthermore, harmonised public reporting is likely to allow for exhaustive trade databases to be built that will support the

development of TCA, whose role in the industry is set to become even more than essential with the arrival of MiFID and, in particular, the best execution obligation. On this point, harmonised public reporting is likely to contribute to the protection of investors.

Even though public trade reporting will be improved overall under MiFID, two issues remain to be brought to the attention of the reader.

First, harmonised public reporting only relates to equities so far. The European Commission is aware that similar requirements will be necessary in other asset classes. For this purpose, a call for evidence on transparency in bond markets and other non-equity markets was launched in June 2006 and further analysis was being carried out by CESR<sup>7</sup> at the time of publication. Those markets in which post-trade reporting are more likely to be useful from a market efficiency standpoint are probably those that are currently most fragmented, rendering the implementation of such an obligation even more complex.

Secondly, conditions under which trade information should be made available remains too vague to seriously limit the risk of market data fragmentation. Infrastructure for disclosing post-trade transaction information already exists and is largely used by exchanges and existing alternative trading systems to distribute information through to major data vendors. The question raised by MiFID is therefore not so much the technical implications of multiple reporting but rather the commercial basis on which investment firms are prepared to agree for information to be disclosed. Data vendors usually pay yearly fees to exchanges to access data feeds – data that is then distributed to their customers. The increase in the number of data sources may result in a significant increase in the nominal cost for data vendors to source the data, possibly resulting in partial reporting channels only made available to the end investor.

## 2. Pre-trade transparency obligation

In order to protect the quality of markets, and to a larger extent, end investors, MiFID requests a certain number of pre-trade transparency requirements to be fulfilled. However, intense lobbying from multiple industry participants has resulted in restricting these rules to the most liquid equities only.

In essence, the regulator has just watered down one of the most important forms of protection, precisely where it is likely to be most useful. By allowing opaque liquidity pools to develop on illiquid stocks, we believe that MiFID is going to fail to ensure market efficiency and investor protection for those segments of the market.

To explain how/why we draw such a conclusion, the present section is structured as follows. First of all, we will describe pre-trade transparency requirements imposed on execution venues for equities. Next, we will identify the likely impact of these requirements on the market structure. Finally, we will show why the pre-trade transparency rules are not expected to be as effective as they should in ensuring price efficiency and investor protection. To support this belief, we will use the extant academic literature as well as the results of an empirical study we conducted on the Euronext cash equity markets.

### 1) Pre-trade transparency requirement details

Pre-trade transparency rules have been harmonized between for RE and MTF, while SI have been provided with slightly different provisions resulting in less stringent requirements.

#### a) Rules for RE and MTF

Under MiFID, market operators operating an RE and investment firms operating an MTF will be required to make public current bid and ask prices as well as the depth of trading interests at these prices which are advertised through their systems in respect of shares admitted to

trading on a regulated market. All details to be taken into consideration for defining the nature of information to be disclosed is summarised in Table 1 according to the nature of the trading system. However, the regulation allows competent authorities to waive the pre-trade transparency obligation in some circumstances. It is the case either when the market model or the type of order does not require pre-trade information to be disclosed or for orders considered large in scale compared to normal market size.

Table 1: Summary of pre-trade requirements for RE and MTF

Type of trading system	Information to be made public
Continuous auction order book	5 best bid and ask prices Number of aggregate orders at each level Aggregate depth (in shares) at each level
Quote-driven system	Best bid and ask prices for each market maker Depth at each price
Periodic auction system	Theoretical equilibrium price with traded volume at that price
Other systems	broadly similar requirements

Overall, these obligations imposed by MiFID are not inconsistent as they correspond to existing rules on RE. It is natural to apply similar and harmonised rules to MTF when they operate similar trading systems.

#### b) Rules for SI

Following intense lobbying from various industry participants, pre-trade transparency requirements were defined differently for SI. Specifically, the obligation is lighter as it only applies when they trade shares admitted to trading on a regulated market for which a liquid market exists and for sizes up to standard market size. Within this context, we need to define "a liquid market" and "standard market size" for the purpose of this Directive.

According to MiFID<sup>8</sup>, a share admitted to trading on a regulated market shall be considered to have a liquid market if the share is traded daily,

<sup>8</sup> - These conditions are provided in the Implementing Regulation, Article 22.

## 2. Pre-trade transparency obligation

with a free float not less than €500 million<sup>9</sup>, and if one of the following conditions is satisfied:

- the average daily number of trades in the share is not less than 500;
- the average daily turnover for the share is not less than €2 million.

Similarly, the regulation defines how shares will be grouped in classes as far as the standard market size is concerned<sup>10</sup>. These classes are derived from the average value of trades (AVT) observed on the relevant market. It is worth noting that the market for a given share is assumed to be comprised of all orders executed in the European Union, excluding those of large size in scale compared to normal market size for that share. According to the provided classification, standard market size can vary from €7,500, for shares with an AVT lower than €10,000, to €80,000 for shares with an AVT between €70,000 and €90,000.

Early estimates provided by the regulator suggest that between 500 and 700 shares will be eligible for systematic internalisation. Under MiFID, investment firms internalising only orders above the standard market size or dealing in non-liquid equities will consequently not be expected to publish their quotes.

### 2) Consequences for the industry

The specific provisions relating to SI are undoubtedly those that have caused most concern, alongside those related to the best execution obligation, within the financial industry, especially in the UK where internalisation is widely adopted as a common practice. The debate is ongoing as to how many investment firms are likely to fall into the category of SI, and the costs of complying with the new transparency rules have already been estimated at several million for individual investment firms. While most consultancy firms are urging financial institutions to budget significant amounts of money for ensuring compliance with MiFID, it may be interesting to analyse the likely impact on the industry further.

Systematic internalisation for blue chips and very liquid securities is likely to be of interest only to very few of the largest firms, who may find an interest in systematically internalising client orders because of significant and high quality order flows. Margins on such internalisation are likely to remain minimal owing to the very high efficiency of the regulated markets on which the securities are listed, requiring systematic internalisation to be managed as a scale business. For the above-mentioned firms, infrastructure costs related to publishing quotes will remain marginal. Yet it remains to be seen whether these large firms might not successfully argue that internalisation does not constitute an activity that can be considered as "commercial material" in comparison with their other business lines, and that it does not involve specific and dedicated staff and infrastructure.

On the other hand, a more significant number of firms may be willing to internalise on those securities that offer higher intermediation margins, typically the mid and small caps that do not fall under MiFID's pre-trade transparency obligation, or on order sizes above standard market sizes only. For these firms, internalisation will remain or become a lucrative business model. It is thus mainly this kind of SI that is likely to develop across Europe.

What may explain the difference in interpretation between the UK and the continent is probably the fact that prior to MiFID internalisation was a common practice in the UK in a regulatory context that was significantly less complex than that which the new Directive is drafting for. MiFID therefore comes as a new regulatory hurdle, bringing no additional business opportunities and, probably, stronger competition from other European countries. Indeed, for countries such as France, where the order concentration rule has prevailed, the cost of complying with the new pre-trade transparency requirements is likely to be offset by new business opportunities.

Most likely, the largest firms may well have to compare the benefits and costs of operating as

9 - Excluding holdings exceeding 5% of the total voting rights of the issuer where not held by a pension fund or a collective investment undertaking scheme.  
10 - Article 23 of the Implementing Regulation.

## 2. Pre-trade transparency obligation

an SI with rolling out an MTF and internalising when needed through such a non-discretionary system. Similarly, the costs related to publishing quotes may well make the case for RE to offer some kind of "internalisation order books" on their own systems and therefore leverage the investments already made to provide pre- and post-trade transparency (as recently announced by the major European exchanges).

The specific business models of each individual investment firm, as well as the nature and quality of their client order flow, are, in the final analysis, what will drive a strategic decision to invest or not in the infrastructure required to operate as an SI. It remains difficult at this stage to predict how market participants will react overall, as each individual firm is currently in the process of assessing its business portfolio and preparing the realignment of its operations to benefit as much as possible from the new regime. All in all, it cannot be denied that MiFID is offering a range of new opportunities for investment firms to develop or reinvent their services for retail and professional clients.

### 3) Contribution to market integrity and investor protection

In order to explain why we believe that the pre-trade transparency rules may not be as effective as they should, a close look at the extant literature is first necessary. This will help to understand how pre-trade transparency plays an important role in ensuring that liquidity pools function well and that prices remain informative in a fragmented marketplace. Only then will we be able to expose why the new regulation is likely to fail in ensuring market efficiency and, consequently, investor protection.

#### a) Fragmentation, pre-trade transparency and market quality

Fragmentation occurs when all orders relative to a given security do not interact with each other on a single execution system. Markets are fragmented when operators can trade the same

securities in various trading venues. Markets are consolidated when all market participants trade on the same execution venue. In practice, we obviously refer to fragmentation as soon as a given security is cross-listed or may be traded on multiple execution venues. So, it is clear that the European trading landscape is going to be more fragmented post-MiFID as the new regulation encourages the proliferation of liquidity pools.

In academia, a lot of both theoretical and empirical studies have been conducted in order to analyse how fragmentation can affect market quality<sup>11</sup>. Drawing direct conclusions from these academic papers is not always obvious, because the findings are often complex and contradictory. Some papers emphasise the damaging effects of fragmentation, which result in less market liquidity and less price efficiency. Others report the positive effects of fragmentation, among which cost competition and market diversity are the most relevant for investors.

What is interesting here is that fragmentation does not necessarily imply lower market quality. The existence of conflicting or inconclusive empirical results itself shows that increased fragmentation does not automatically lead to higher transaction costs and less informative prices. Actually, this suggests that there is a possible trade-off between consolidation and fragmentation, when fragmentation provides benefits of market diversity and cost competition without harming market quality and hurting end investors.

Two conditions are sufficient for a market to reach such a trade-off between fragmentation and consolidation, which is beneficial to end investors<sup>12</sup>. First, market participants need to easily know about trading conditions prevailing in each liquidity pool. If this is not the case, each pool is an isolated market where price formation does not depend on what happens in the other liquidity pools. The resulting prices do not incorporate all available information about the security traded. Furthermore, transaction costs

11 - A review of the relevant literature is available in Giraud & D'Hondt (2006).  
12 - For more details, see Harris (2003).

## 2. Pre-trade transparency obligation

are high because liquidity demands in a given trading venue are not matched with liquidity supplies available in the other venues. Second, market participants need to know what happens in the other liquidity pools in order to respond to these market conditions. Specifically, some participants need to act on this information when prices diverge.

Conditions for enabling some consolidation of fragmented liquidity pools and mechanisms contributing to this consolidation highlight the importance of information circulation: market participants need to observe and act upon information in all trading venues. This leads to the concept of pre-trade transparency, which guarantees the largest information circulation around the marketplace.

In practice, the contribution of pre-trade transparency to market quality is quite direct. First, making public both quoted prices and sizes help market participants to adjust their order submission strategy to the available information<sup>13</sup>. Such adjustments make prices informative across execution venues. Next, when multiple liquidity pools co-exist, market participants have to decide where to route their orders. This decision relies on where they expect to get the best execution conditions, especially the best price<sup>14</sup>. Such order-routing decisions, which require pre-trade transparency, actively contribute to the balancing of liquidity demands and supplies across all execution venues.

To summarise, the extant literature thus recognises the necessary role played by pre-trade transparency to mitigate the perverse effects of fragmentation. The more transparency we have on prevailing quotations, the less damaging fragmentation can be.

### b) Effectiveness of the new rules

The right question here is whether MiFID's requirements will allow the marketplace to find a possible trade-off between consolidation and fragmentation, fragmentation providing benefits

of market diversity and cost competition without harming market quality and investors. To address this issue, we need to distinguish between liquid equities, illiquid equities and other financial instruments. Indeed, the expected impact on market structures for non-liquid equities, as well as for other financial instruments (bonds, derivatives, etc.), is more questionable, essentially because pre-trade transparency requirements are lower.

### Liquid equities

Fragmentation is likely to remain limited for liquid equities. In the short term, new execution venues will undoubtedly emerge in the marketplace, in the form of both MTF and SI. However, a certain amount of consolidation is likely to occur, resulting in the formation of some established liquidity pools, owing to cost competition and high transparency requirements, as well as self-regulation by market forces.

- Increased competition will encourage trading venues to reduce the direct costs of trading (market fees) and listing (listing fees), thereby decreasing their own revenues. This cost competition should induce some actors to seek economies of scale in consolidation.
- Strict requirements on pre-trade transparency are likely to have two consequences. First, they constitute a significant barrier to entering the marketplace. These requirements will therefore restrict the proliferation of execution venues, especially SI, as explained earlier. Firms currently operating in Member States where internalisation is not possible face an important business conundrum: is the cost related to implementing pre-trade transparency worth the additional profits generated by systematic internalisation? Some potential SI will decide to throw in the towel or, perhaps, consolidate with others to make compliance with MiFID's pre-trade transparency rules less costly. Next, high transparency requirements will impact the business models of market data providers. The increased competition in this field will undoubtedly encourage the development, at low cost, of market data aggregation solutions for

13 - Empirical research has shown that traders' behaviour is significantly affected by market conditions. At a given time, traders tend to base their order placement strategy on information available on market screens. When traders also have access to information about market conditions in other segments, they can adjust their orders in light of this additional information. Therefore, in the market segment in which they trade, they reflect information that market participants reveal in other segments.

14 - At a given time, those seeking liquidity generally prefer routing their orders to venues offering a high liquidity supply. By contrast, liquidity providers prefer routing their orders to venues with a prevailing high liquidity demand.

## 2. Pre-trade transparency obligation

liquid equities. This will allow the dissemination of information across execution venues at relatively low cost, thereby allowing market participants to observe and act upon information in all trading venues. Therefore, pre-trade transparency will facilitate arbitrage and guarantee informative prices.

- High transparency requirements provide foundations for an effective best execution policy. When information about prevailing conditions at multiple trading venues is publicly available, it allows brokers to route orders to the best available market, given the client's preferences or constraints. On the other hand, both pre- and post-trade transparency will help investors assess the performance of their brokers and check whether the best execution policy is really effective, especially through TCA. As a consequence, effective best execution is likely to enhance competition among trading venues and ensure price priority, thereby favouring liquid and efficient execution venues at the expense of others.

As a whole, all the elements necessary for providing market diversity without increasing total trading costs seem to be gathered for liquid equities, suggesting a win-win situation for end investors.

### Illiquid equities

For illiquid equities, MiFID requires both pre- and post-trade transparency for RE and MTF, but only post-trade transparency for SI. On the one hand, the absence of pre-trade transparency infrastructure for internalisation on illiquid equities is likely to attract, as already explained, firms of small and medium size, allowing them to focus on and specialise in those markets. Real attractive opportunities for internalisation on non-liquid equities will lead to greater competition as well as increased fragmentation. On the other hand, no transparency requirement for SI quotations is going to restrict the dissemination of information across trading venues. In such circumstances, market participants will not be able to observe and act

upon information in all liquidity pools. Therefore, absence of pre-trade transparency is likely to make arbitrage more difficult and informative prices will not be guaranteed.

Such a fragmented marketplace with restricted pre-trade transparency is likely to jeopardise the development of effective best execution policies. Information asymmetry brings up the question of possible conflicts of interest between clients, who seek best execution, and intermediaries, who can have self-interest in executing orders in-house because it allows them to avoid paying exchange fees and time executions relative to their own trading interests or those of another large client. This conflict of interest is particularly relevant for retail investors or when investors are not able to easily monitor intermediaries' performance.

All in all, we can say that not all the elements necessary for limiting the damaging effects of fragmentation are present for illiquid equities, although increased fragmentation is expected. By allowing SI to develop on illiquid stocks without requiring pre-trade transparency, MiFID is going to increase fragmentation without imposing necessary rules to mitigate its damaging effects.

Going one step further, we believe that the regulator has just watered down one of the most important obligations, precisely where those obligations are most required.

The situation is rendered even more problematic in that the price constitution mechanism is, by virtue of its construction, less efficient on the illiquid side of the market spectrum, as witnessed even on a centralised market such as Euronext. Table 2 and Table 3, report the findings of an empirical study conducted on implicit transaction costs incurred currently by investors on the Euronext equity markets. (All the details relative to this empirical analysis are provided in Appendix 1.)

## 2. Pre-trade transparency obligation

Table 2: Descriptive statistics about implicit transaction costs per share

Indicator*	Liquid Stocks				Illiquid Stocks			
	Mean	Upper Quartile	Median	Lower Quartile	Mean	Upper Quartile	Median	Lower Quartile
Closing price	3.57	38.91	0	-32.36	20.92	70.42	0	-33.43
VWAP	6.31	30.31	4.44	-20.27	30.92	61.03	16.75	-12.11
Effective spread	17.42	12.16	7.55	4.45	113.9	98.10	46.05	20.02

\*expressed in basis points per share

Table 3: Total implicit transaction costs over the one-month period

Indicator	Liquid Stocks		Illiquid Stocks	
	In EUR	Relative to the TT*	In EUR	Relative to the TT*
Closing price	17,571,218	0.01%	3,413,777	0.10%
VWAP	45,790,993	0.04%	4,627,843	0.14%
Effective spread	129,204,456	0.11%	21,916,632	0.65%

\*total turnover

In Table 2, we show the implicit cost per share in basis points, by making a distinction between liquid and illiquid stocks based on the definition given by MiFID. Whatever the indicator we consider, the average cost per share is, as expected, much lower for liquid stocks. If we focus on the effective spread, we observe that investors currently incur implicit costs on illiquid stocks that are about 6.5 times higher than those incurred on liquid stocks. Similar evidence is provided in Table 3, where total implicit costs are reported relative to the total turnover. If we focus again on the effective spread, implicit costs represent 0.11% of the total turnover for liquid stocks against 0.65% for illiquid stocks. From this aspect, trading on illiquid stocks is unsurprisingly more costly.

Although these results do not provide anything new on the debate about lack of liquidity for less active stocks, this study exhibits a significant gap in implicit costs between liquid and illiquid stocks. This gap is observed at a time when the concentration rule is in place, raising concerns that fragmentation will exacerbate this already delicate situation. Because concentration and/or information is a factor for rendering markets

more efficient, it is trivial to expect those implicit costs to significantly increase in a fragmented market with absence of pre-trade transparency.

A similar analysis can be conducted for explicit costs, which, when limited to brokerage fees, exhibit a strong correlation to the level of illiquidity of the underlying instruments as demonstrated in Table 4.

Table 4 exhibits the average commission (brokerage fees) measured on a sample of 1,000,000+ transactions carried out during Q4 2006 by approximately 250 intermediaries for 100 investment management firms in the UK and Continental Europe. The table distinguishes between Large Capitalisation and Small/Medium capitalisation (however, not according to the same criteria that defines an illiquid stock under MiFID).

Once again, we can witness a twofold difference between commission paid on large caps versus commissions paid on small and mid caps. If commission does not form part of the pre-trade transparency requirements imposed upon equity

## 2. Pre-trade transparency obligation

Table 4: Average/High/Low Commissions on European equity transactions (bps)

Country	Large Cap			Mid/Small Cap		
	Average	High	Low	Average	High	Low
France	7.1	15.0	5.0	19.5	25.0	15.0
Germany	10.7	15.0	7.0	18.3	25.0	15.0
Italy	9.8	20.0	5.0	22.1	30.0	18.0
Netherlands	10.3	13.0	9.0	19.4	28.0	15.0
Spain	11.7	19.0	8.0	21.8	25.0	15.0
Sweden	9.7	12.0	8.0	19.4	25.0	15.0
UK	6.1	10.0	5.0	23.7	30.0	18.0

Commission data supplied by GSCS Information Services ([www.gscs.info](http://www.gscs.info))

transactions, it remains to be explained why transparency requirements are lighter in those markets where explicit and implicit costs are significantly higher for the investor.

### Other financial instruments

To date, no transparency requirement has been designed for other financial instruments. Non-equity instruments (bonds, ETFs, listed futures and options, spread bets, etc.) will be traded on- or off-exchange without incurring any form of mandatory pre-trade transparency, leaving room for the development of possibly opaque liquidity pools with little transparency on the order book, if any.

Discussions are currently taking place on the opportunity to develop transparency for those transactions. However, whatever the forthcoming decision about transparency, MiFID is likely to generate considerable consolidation as well as a growth of MTF for the other financial instruments, because the current trading environment is often highly fragmented with little transparency and low levels of control on the quality of execution.

### 3. Best execution obligation

The best execution obligation is a crucial element in investor protection and has to be viewed as the natural counterpart of a full liberalisation of the marketplace. This obligation lies in the now famous Article 21, which has been at the heart of the arguments put forward by many opponents of MiFID. Initiated as an obligation of result in a principle-based regulatory approach, the best execution obligation has been actively fought by industry representatives and has slowly turned into a more modest obligation of means that remains complex and ambiguous.

In the present section, we will first summarise the details of the provision. We will then be in a position to highlight how this unbalanced provision leaves significant question marks on the expected effectiveness of the new obligation, which may simply result in significant additional costs with no real higher level of investor protection. To help understand how investment firms should react to this new obligation, we finally propose a new framework in total compliance with MiFID for advanced transaction cost analysis (TCA), whose role in the industry is set to grow.

#### 1) Best execution provision details

Within the 2004 Directive, the best execution obligation has been defined as an obligation of means whereby investment firms are required to have taken all reasonable steps to obtain the best possible result for the client. This obligation is therefore structured around three major principles:

- a) an obligation of means to achieving the best net result for the client, involving factors that determine whether or not this best net result has been achieved (pending definition of the criteria and their relative importance);
- b) documentation of an execution policy that includes the execution venues and documentation of the parameters that justify these choices;
- c) an obligation for investment firms to demonstrate, at the demand of the client, that execution has been carried out in accordance with the agreed execution policy and that the

execution policy allows achievement of the best possible result on a consistent basis.

It is interesting to note that, at this stage, the factors supposedly determining what the best possible result is include not only fees but a wide range of elements that can be used to qualify the quality of a negotiation, namely "price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order".

#### 2) Ineffectiveness of the new obligation

Although the intentions of the Directive are clearly to protect the investor (as suggested by the name given to the obligation itself, "obligation of Best Execution"), we have serious concerns about the results one can expect from the rule. These worries come from the following issues that will be developed hereafter:

- structural failure of the provision itself;
- absence of consensus on what best execution means;
- difficulty of dealing with an obligation of means.

##### a) Structural failure of the provision

The concept behind Article 21 is to provide a principle-based requirement for investment firms to take all reasonable steps to obtain the best result for the client. The troubling issue with the provision is the significant inconsistency in how the first paragraph of the chapter is structured. This paragraph starts with an obligation of means summarised as an obligation to "take all reasonable steps to obtain the best possible result", which is clearly inconsistent with an attempt to create an obligation of result as suggested by the emergence of a definition of what the best result should be: "taking into account price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order".

At this stage, the regulator has put itself in a somewhat schizophrenic situation whereby any

### 3. Best execution obligation

attempt to state what a "best net result" for the client is, would indubitably cause about half of the industry to rise up in opposition on the grounds that Article 21 is, and should be, an obligation of means; and, at the same time, the other half of the industry is complaining about an overly prescriptive article that is not consistent with an obligation of means and/or principle-based regulation.

The regulator had two possible options, but chose to take both available routes at the same time:

- impose an obligation of means and leave the industry to develop standards to which clients could refer when confronting an investment firm;
- impose an obligation of result based on a clear and measurable objective.

With such an unbalanced provision, we believe that there is absolutely no chance that either the industry or the investor will develop a sense of confidence that the regulation is fair and protective of their rights.

#### b) Absence of consensus on what best execution means

There is today in the industry a total absence of consensus on what best execution means, in particular because of the differences in clients' requirements, but also because of the absence of a conceptual framework for measuring the quality of execution. What are the elements that characterise the quality of execution, and what approach should be used to assess this quality – benchmarking, peer group analysis, etc.? On this point, MiFID has not brought a clear definition and a measurable objective that would allow investors to seriously assess whether or not transactions have been negotiated in their best interests.

#### -> No consensus on best execution definition

In theory, best execution is defined as a measure of how well investors' trades are executed. This definition encompasses several components, such as the trade price, the execution speed,

the opportunity for price improvement, the probability of full execution, the respect of anonymity, the level of explicit costs, etc. Even if the total proceeds of the transaction paid by the investor is still the main dimension, the others are not to be ignored. This is especially true when investors instruct the intermediary to execute the order under strict conditions (volume, deadline or other execution constraints). The consideration of all best execution components makes the debate harder, essentially because some of these components are not easy to measure. Either the information is not directly available (execution speed, price improvement) or the component itself is not measurable (respect of anonymity).

As a direct result of the underlying complexity of defining best execution, the regulator has shifted its focus to the means rather than simply to the result.

#### -> No consensus on a standardised framework

TCA has been developed so far to answer specific issues about individual aspects rather than to address the quality of the entire trading process. Unfortunately, the existing approaches do not offer a unified framework to easily assess execution quality across a series of trades at any aggregate level.

The reasons for this are at least twofold.

First, existing indicators provide absolute measures of costs, which are often expressed in basis points. Determining whether the transaction costs are low, normal or large is not straightforward. Actually, with such results, the assessment of the execution quality is left to the investor and can therefore be very subjective. The investor can build his own scale of costs, determining on his own at which level the quality of execution is poor. He can also make comparisons with costs of other similar trades. But if those trades are completed by the same intermediaries or in different market circumstances, the assessment will also be biased.

### 3. Best execution obligation

Secondly, existing indicators rely on benchmark prices that depend on the trade characteristics. The benchmark price is assumed to be an appropriate price of reference regarding the timing, size and difficulty of the trade. Consequently, using only one benchmark price to analyse the execution quality of a universe of trades is easily criticisable, except if all the trades are similar in time, size and overall difficulty.

The absence of a standardised framework has led to the absence of a consensus about a universal indicator. This phenomenon explains why the number of available indicators today is so high in the industry (over 200). In face of the multiple tools that are offered, investors are often bewildered, especially when indicators are based on sophisticated models that resemble black boxes.

By providing only partial guidelines on how investment firms should assess the quality of execution through a double system of criteria and factors to be taken into consideration, but without determining how these will actually work, the regulator has left all industry participants quite frustrated, with those wishing for a principle-based approach being left only with an overly prescriptive rule and those willing the regulator to define precise criteria to meet the obligation being left with too much flexibility in the application of Article 21. This situation has led to significant resistance and mistrust in what the best execution obligation is able to achieve with regard to the fair protection of all parties.

#### c) Difficulty of dealing with an obligation of means

In an environment where the regulator has confused an obligation of means with an obligation of results, investment firms are likely to focus their efforts on demonstrating that they have fulfilled the former by having "taken all reasonable steps to obtain, when executing orders, the best possible result for their clients". However, dealing with an obligation of means is far from easy. In most circumstances, clients

and intermediaries may end up discussing the specifics of a transaction that could have justified different treatment. This is unlike an obligation of result, which, although tighter for the investment firm with its repeatable and non-contestable quality measure, could have been seen as less daunting.

Worse still, with no other definition than an obligation of means (that of clarifying an execution policy, being transparent on that policy and ensuring the policy allows achievement of the best possible result on a consistent basis), MiFID is in fact likely to significantly increase adverse selection and moral hazard. More specifically, some client segments risk not being in a position to easily assess the quality of the service provided. While the risk for professional clients and institutional clients remains limited, thanks to the numerous providers that are likely to offer best execution analysis services, the risk for retail clients who have limited access to post-trade analytics and market information still remains very high. In fact, this very reassuring "best execution" duty is likely to give investors a misleading sense of confidence that the result has been achieved, while the provider's responsibility will only remain that of putting the means in place to achieve this goal.

#### **3) EDHEC proposal: a new framework for advanced TCA**

Because it is our aim to attempt to provide solutions, EDHEC is currently developing an innovative framework for the analysis of transaction costs. Indeed, the role of TCA in the industry is set to become even more than essential with the arrival of MiFID. However, as we have seen previously, the current absence of a standardised framework to easily assess the quality of the entire trading process is problematic. The EDHEC approach tries to fill this gap by offering a unified framework for measuring ex post the quality of execution.

### 3. Best execution obligation

Because peer groups or relative analysis are frequently demolished by market participants that consistently identify good reasons not to accept a benchmark or a peer group as relevant for assessing the quality of their trade (under the justification of more or less relevant arguments), we have opted for an absolute measure of the price obtained, which is a score between 0 (bad performance) and 1 (good performance).

More precisely, our approach, the EBEX framework (EDHEC Best Execution), is based on two fundamental principles.

First, the average trade price is the primary component of the quality of an execution, even if other dimensions exist. The price includes all the implicit costs related to the execution, except the missed trade opportunity cost<sup>15</sup>. It must be said that other explicit costs (brokerage fees, stamp duties and IT and operational costs) can be assessed separately on a global basis rather than trade by trade. Furthermore, qualitative elements such as timeliness and speed of information flow are further important elements that cannot be included in a systematic quantitative framework.

Secondly, we consider that the best reference for assessing the quality of a price ex post is the universe of all trades relative to the same security, executed on the available trading venues, under similar timing.

Specifically, the EBEX framework relies on a couple of indicators allowing an easy comparison of a large universe of trades and providing insightful information not only about the final performance (the absolute EBEX indicator) but also about the possible justification of the performance (the directional EBEX indicator), thereby actually providing a measure of the quality of the market timing. The detailed methodology is available in Appendix 2.

EBEX exhibits several advantages, especially in comparison with current practices witnessed in

the industry. On the one hand, this approach is very simple, provides a standardised framework to assess the quality of execution across a series of trades aggregated at any level, and is in total compliance with MiFID's requirement to demonstrate that the objective sought has been reached. On the other hand, this approach delivers absolute measures of the quality of execution, allowing straightforward and objective interpretation, and also includes trade-timing consideration. Such an approach allows the investor to easily determine whether or not the quality of his intermediary, trader or even algorithm can be considered to be in the upper quartile.

EBEX is being actively discussed between professionals and academics, and we are confident that positive developments will be proposed in the very near future to allow it to cope with specific situations that the first version did not cater for, such as the client's constraints or the cost for the client associated with the broker's performance.

15 - The missed trade opportunity cost is a component of opportunity costs that refer to the cost associated to unfilled orders or partially filled orders. The principle behind it is that failing to trade can be costly for the end investor, who will have missed the opportunity to invest in the security requested.

## Conclusion

In this position paper, EDHEC has emphasised several important issues that are probably not the expected outcome of MiFID. Even though we recognise that the intentions of the Directive are clearly both to ensure market integrity and protect end investors, we have serious concerns about the results one can expect from the newly introduced requirements about both pre-trade transparency and best execution. A lack of relevance in the way requirements are defined and/or a lack of accuracy in the way they have to be implemented suggest that, as things stand today, market integrity and investor protection are not likely to be re-enforced post-MiFID.

Following intense discussions with industry representatives, the Directive has restricted harmonised pre-trade transparency requirements for Systematic Internalizers to the most liquid equities only. Hence, MiFID leaves room for the development of possibly opaque liquidity pools for non-liquid equities and other financial instruments, with little transparency on the order book, if any. As we have shown, the regulator has just waived the pre-trade transparency obligation where it is probably the most necessary. Because of increased fragmentation and less transparency, trading on illiquid stocks post-MiFID may well be even more costly than it is today.

Initiated as an obligation of result in a principle-based regulatory approach, the best execution obligation has been actively fought by industry representatives and has been slowly turned into a more modest obligation of means that remains complex and ambiguous, if not overly prescriptive. With such an unbalanced provision, we believe that there is absolutely no chance that either the industry or the investor will develop a sense of confidence that the regulation is fair and protective of their rights.

By aiming to strongly protect the end investor in a largely liberalised environment, the European regulator may well have put itself in a situation where some participants will risk "singeing their wing-feathers" despite being highly confident

that the Directive requirements are working in their favour. Obviously, this opinion should not be read as a death sentence for MiFID, which remains a very welcome initiative, but rather as a strong call to the industry to reinvent itself and develop a proper evaluation framework that will shed some light on the actual quality of the service offered to professional and retail clients.

## Appendix 1: a close look at the realities

We conducted an empirical study on the Euronext equity markets. We focused precisely on implicit transaction costs incurred by investors for all the listed equities in continuous trading on the following four regulated execution arenas: Paris, Amsterdam, Brussels and Lisbon. The sample period covers January 2005 and includes 816 stocks<sup>16</sup>. The empirical analysis that is described hereafter was performed with public Euronext market data about trades and best quotes.

### a) Liquid versus illiquid shares

First of all, we distinguished between liquid and illiquid stocks with respect to the Directive's definition. In the absence of information on the real free float of stocks, we only used the two conditions about daily trading activity. To be considered as liquid, a share has to exhibit an average daily number of trades equal to or higher than 500 or an average daily turnover of not less than €2 million. Based on this definition, we identified 180 liquid for 636 illiquid stocks in our sample. Liquid shares thus represent only 22% of all the equities in continuous trading on the Euronext platforms. Descriptive statistics about trading activity for both stock categories are provided in Table 5. These statistics reveal the big gap between liquid and illiquid stocks. Over January 2005, our sample actually includes 5,550,359 transactions executed in continuous trading for a total turnover exceeding €121,569 million. The 180 liquid stocks are responsible for the large majority of the activity: they represent 91% of the trades and more than 97% of the turnover.

### b) Implicit transaction costs: definition and computation

Transaction costs incurred by investors are generally divided into explicit and implicit costs. Explicit costs are direct costs of trading (fees and commission) while implicit costs depend mainly on the trade characteristics relative to the prevailing market conditions. For our analysis, we focused on implicit transaction costs because they significantly reflect the market quality.

The current cost measurement practice in the industry consists of comparing the dollar value difference between the executed position and the position evaluated at some benchmark price. For a given transaction, the dollar value per share is given by the signed difference between the average price obtained for the trade and the benchmark price<sup>17</sup>. A positive value indicates an execution that is less favourable than the benchmark price, while a negative value indicates more favourable execution than the benchmark. In this approach, a negative cost represents savings. The choice of the benchmark price is crucial in such measurement. The set of benchmarks that are usually used includes pre-trade, intraday and post-trade prices of reference.

The goal of our analysis is not to discuss how these various benchmarks are efficient and how unbiased the results they provide are when assessing broker's performance<sup>18</sup>. Our aim is rather to gauge implicit costs currently incurred by investors. Hence, we decided to compute implicit transaction cost measures with several benchmarks that we had easily at hand in our Euronext market data. We focused specifically on the following benchmarks: the closing price, the daily VWAP and the time-of-trade midpoint.

Table 5: Descriptive statistics about trading activity

Activity	Liquid Stocks				Illiquid Stocks			
	Mean	Upper Quartile	Median	Lower Quartile	Mean	Upper Quartile	Median	Lower Quartile
ADT*	32 205	34 598	9 347	4 432	272	342	78	22
ADNT**	1 400	1 825	845	355	42	48	19	7

\*Average Daily Turnover (in €K)

\*\*Average Daily Number of Trades

16 - This stock sample includes domestic as well as foreign equities.

17 - For a buy, the transaction cost indicator is defined as the trade price minus the benchmark price. For a sell, the transaction cost indicator is defined as the benchmark price minus the trade price.

18 - A critical review of the most popular benchmark prices is available in Giraud & D'Hondt (2006).

## Appendix 1: a close look at the realities

We then calculated for each transaction in our sample three implicit cost indicators. The first one is based on the closing price of the trading day and is named the closing price indicator. The second is based on the daily VWAP and is named the VWAP indicator. Finally, our third indicator is the effective spread, which is defined as twice the signed difference between the trade price and the time-of-trade midpoint<sup>19</sup>. These different indicators enable assessment of current implicit costs for both liquid and illiquid stocks. To make sense, our results have to be compared between liquid and illiquid shares on the same indicator, and not across indicators.

Before computing the cost indicators, we had to sign transactions. Indeed, Euronext public market data report detailed information about all the trades executed in the limit order book, except the trading direction. To solve this issue, we used the Lee and Ready tick algorithm that consists in designating trades as either buy- or sell-initiated. This methodology, which is frequently applied in academic papers when trade direction is not directly available, involves matching the trade price to the market quote at the time of execution. If the trade price is higher (lower) than the midpoint, the trade is designated as a buy-initiated (sell-initiated). If the trade exactly occurs at the midpoint, the trade is signed based on the previous tick change. The assumption behind this is that buyers push up prices while sellers push down prices. Exhaustive literature has been devoted to this traditional trade direction algorithm. The main conclusion is that it often acknowledges less than 100 percent accuracy<sup>20</sup>. This lack of accuracy depends mainly on the way trades are matched with quotes and can result in some overestimation of effective spreads for active stocks. For our analysis, we matched trades with contemporaneous quotes at the time of execution. This method is reported to deliver good estimates of effective spreads for stocks traded electronically<sup>21</sup>.

19 - The liquidity premium, which is defined as the simple signed difference between the trade price and the time-of-trade midpoint, is also commonly used in the industry. Obtain it, we simply cut the effective spread in half.

20 - Some examples of papers dealing with this issue are the following: Lee and Ready (1991) suggest the accuracy of their method is approximately 90%; Odder-White (2000) suggests the accuracy is closer to 85%; Lee and Radhakrishna (2000) suggest the accuracy is 93%, but this is after discarding approximately 40% of difficult-to-classify trades; finally, Theissen (2001) suggests that the accuracy is about 75% on the Frankfurt Stock Exchange.

21 - Piovolar & Wei (2006) report that trade-quote algorithms can overestimate effective spreads for active stocks traded electronically. They show that matching trades with contemporaneous quotes delivers good estimates of effective spreads.

## Appendix 2: The EBEX (EDHEC Best Execution) indicators

### 1) General presentation

EDHEC's approach provides a simple answer to the following question:

*"Given a transaction handed over to a broker, trader or algorithm and executed for a given price at times that are recorded under given time constraints, to what extent have other brokers, traders or algorithms executed comparable volumes to this transaction, either before or after this transaction, at a better price?"*

The answer to this question can be split into four important elements:

- The time at which the order is handed over (release time) to an intermediary (being a broker, a trader or an algorithm) is the first point of reference while the time at which the order is entirely filled (execution time of the last lot referring to the order in case of splitting) is the second point of reference.
- The size of 'competing trades' is not important as such, the relevant measure is how many times a volume comparable to the order has been executed at a better price, which is a first measure of the quality of the price obtained. The price has to be compared to small trades executed at better prices (the broker, trader, algorithm could have split the order better) as well as with larger trades (the order could have been grouped with a larger flow of orders to be executed in block if such trading capability is offered).
- Volumes traded before at a better price allow one to measure whether the broker, trader or algorithm has been too patient or not.
- Volumes traded after at a better price allow one to measure whether the broker, trader or algorithm has been too aggressive or not.

Based on these elements, the EBEX methodology measures the quality of execution as part of a peer group review and identifies whether the broker, trader or algorithm has implemented the execution too aggressively or too slowly. Specifically, this approach relies on a couple of indicators. The Absolute EBEX indicator measures the quality of execution in a peer group review.

The Directional EBEX indicator identifies whether the broker, trader or algorithm has implemented the execution too slowly or too aggressively. In other words, the first indicator assesses the quality of execution itself while the second indicator brings information about why the quality of execution is as observed.

### 2) Detailed presentation of the indicators

Our two indicators rely on the same philosophy and are easy to both compute and interpret. For a question of convenience, we will begin with the presentation of the second indicator.

#### Directional EBEX

##### a) Definition and components

Directional Estimated Best Execution for an order indicates how the broker<sup>22</sup> could have traded over time to provide a better execution. This indicator results from the combination of two sub-indicators that respectively measure the volumes traded at better prices before and after the trade was executed. Specifically, the directional EBEX indicator for order  $i$  is computed as follows:

$$EBEX_{dir,i} = NBBEX_{i,j} - NABEX_{i,t}$$

$NBBEX_{i,j}$  and  $NABEX_{i,t}$  are thus the components of the directional EBEX indicator. Their definition and computation are very similar, only the measurement window of reference differs.

#### NBBEX<sub>i,j</sub>

$NBBEX_{i,j}$  stands for Number of Before-Better Executions for order  $i$  over the time interval  $j$ . This component can be defined as a ratio between the aggregate volumes traded at a price better than the average trade price of order  $i$  divided by the size of order  $i$  and the aggregate volumes without consideration of price divided by the size of order  $i$ . This ratio is computed over the interval  $j$  which goes from the time the broker receives order  $i$  (release time) to the time order  $i$  is completely filled (execution time).

The mathematical notations referring to NBBEX<sub>i,j</sub> are given below, respectively for sell orders and buy orders.

$$\text{NBBEX}_{i,j} = \frac{\frac{\sum_{n=1}^N V_{n,j}^{P > AP_i}}{(S_i)}}{\frac{\sum_{m=1}^M V_{m,j}}{(S_i)}} \quad \text{NBBEX}_{i,j} = \frac{\frac{\sum_{n=1}^N V_{n,j}^{P < AP_i}}{(S_i)}}{\frac{\sum_{m=1}^M V_{m,j}}{(S_i)}}$$

In both equations, each element is defined as follows:

- NBBEX<sub>i,j</sub> is the number of better executions for order *i* during the time interval *j*
- *j* is the interval between the time the broker receives order *i* and the time order *i* is completely filled
- Si<sup>23</sup> is the size of order *i*
- AP<sub>*i*</sub> is the average trade price obtained for order *i*
- *N* is the number of trades at a price better than AP<sub>*i*</sub> during time interval *j*
- $V_{n,j}^{P > (<)AP_i}$  is the size of trade *n* at a price higher (lower) than AP<sub>*i*</sub> during interval *j*
- *M* is the total number of trades during the time interval *j*; *M* ≥ *N*
- $V_{m,j}$  is the size of trade *m* during time interval *j*

### NABEX<sub>i,t</sub>

NABEX<sub>i,t</sub> stands for Number of After-Better Executions for order *i* over the time interval *t*. This component can be defined as a ratio between the aggregate volumes traded at a price better than the average trade price of order *i* divided by the size of order *i* and the aggregate volumes without consideration of price divided by the size of order *i*. This ratio is computed over the interval *t* which starts at the time order *i* is completely filled (execution time) and which ends at the market close of the day.

The mathematical notations referring to NABEX<sub>i,t</sub> are given below, respectively for sell orders and buy orders.

$$\text{NABEX}_{i,t} = \frac{\frac{\sum_{n=1}^N V_{n,t}^{P > AP_i}}{(S_i)}}{\frac{\sum_{m=1}^M V_{m,t}}{(S_i)}} \quad \text{NABEX}_{i,t} = \frac{\frac{\sum_{n=1}^N V_{n,t}^{P < AP_i}}{(S_i)}}{\frac{\sum_{m=1}^M V_{m,t}}{(S_i)}}$$

In both equations, each element is defined as follows:

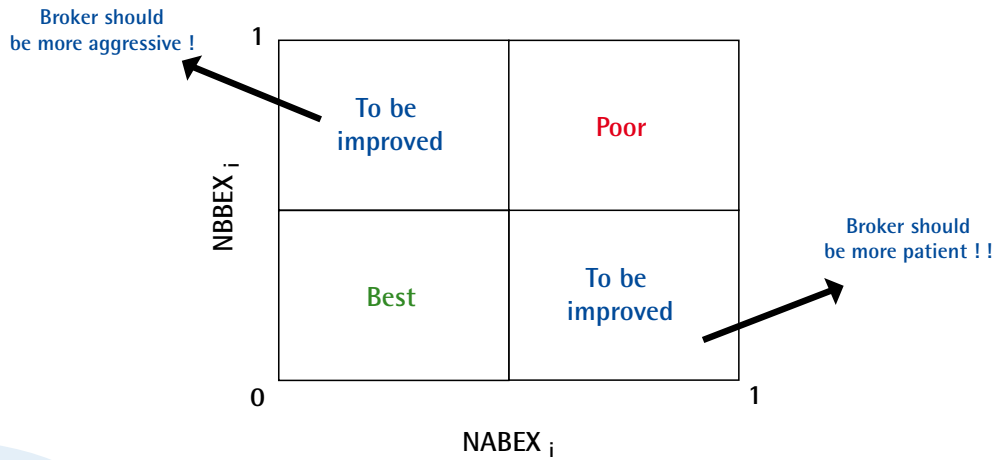
- NABEX<sub>i,t</sub> is the number of better executions for order *i* during the time interval *t*
- *t* is the interval between the time order *i* is completely filled and the next market close
- Si<sup>24</sup> is the size of order *i*
- AP<sub>*i*</sub> is the average trade price obtained for order *i*
- *N* is the number of trades at a price better than AP<sub>*i*</sub> during time interval *t*
- $V_{n,t}^{P > (<)AP_i}$  is the size of trade *n* at a price higher (lower) than AP<sub>*i*</sub> during interval *t*
- *M* is the total number of trades during the time interval *t*; *M* ≥ *N*
- $V_{m,t}$  is the size of trade *m* during time interval *t*

### b) Interpretation

Now that both components of the directional EBEX indicator have been presented, we can focus on how they can be interpreted to characterize the timing of the trade. This interpretation is very easy because both range from 0 to 1, given the way they are built. Figure 1 will help in understanding how the interpretation can be made.

## Appendix 2: The EBEX (EDHEC Best Execution) indicators

Figure 1: Interpretation of directional EBEX components

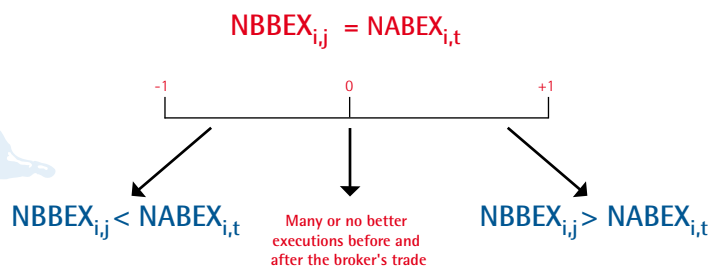


A direct comparison of both indicators delivers our directional EBEX indicator, for which the interpretation is even easier. The goal of this indicator is to give information about how the intermediary could have traded over time to provide a better execution. Given its construction,

a simple difference between NBBEX and NABEX, the directional EBEX indicator can range from -1 to +1. The figure below (Figure 2) summarizes the interpretation of the directional EBEX indicator.

Figure 2: Interpretation of the directional EBEX indicator

$$EBEX_{dir,i} = NBBEX_{i,j} - NABEX_{i,t}$$



### Absolute EBEX

#### a) Definition

The absolute indicator of Estimated Best Execution for an order is defined as the difference between one and a ratio between the aggregate volumes traded at prices better than the average trade price obtained for the order divided by the order size and the aggregate volumes without consideration of price divided by the size of the order. The ratio is then computed over the interval going from the time the broker receives the order (release time) to the next market close. Specifically, the absolute EBEX indicator for order  $i$  is calculated as follows, respectively for a buy or a sell.

$$EBEX_{abs,i} = 1 - \frac{\sum_{n=1}^N V_{n,day}^{P < AP_i} (S_i)}{\sum_{m=1}^M V_{m,day} (S_i)}$$

$$EBEX_{abs,i} = 1 - \frac{\sum_{n=1}^N V_{n,day}^{P > AP_i} (S_i)}{\sum_{m=1}^M V_{m,day} (S_i)}$$

## Appendix 2: The EBEX (EDHEC Best Execution) indicators

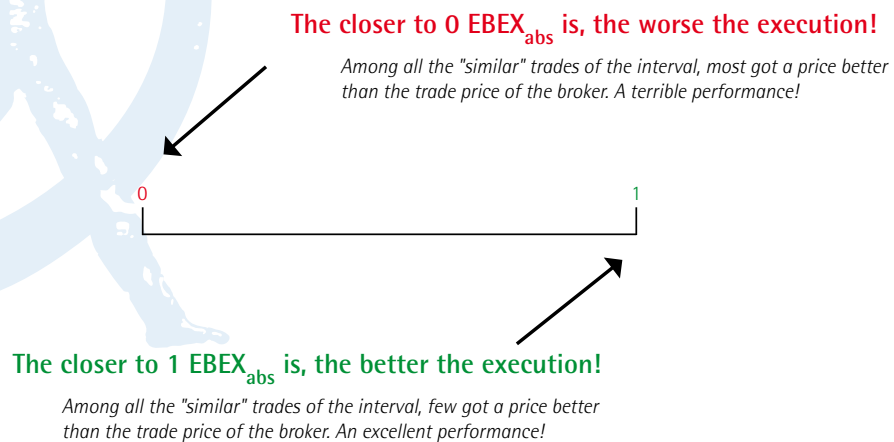
In both equations, each element is defined as follows:

- $EBEX_{abs,i}$  is the absolute best execution indicator for order  $i$  during the trading day
- day is the interval between the time the broker receives order  $i$  is and the next market close
- $S_i^{25}$  is the size of order  $i$
- $AP_i$  is the average trade price obtained for order  $i$
- $N$  is the number of trades at a price better than  $AP_i$  during the time interval
- $V_{n,day}^{P > (<) AP_i}$  is the size of trade  $n$  at a price higher (lower) than  $AP_i$  during interval day
- $M$  is the total number of trades during the time interval day;  $M \geq N$
- $V_{m,day}$  is the size of trade  $m$  during the time interval day

### b) Interpretation

Given the way it is built, the absolute EBEX indicator can only take values between zero and one. This makes the interpretation very easy, as illustrated in Figure 3.

Figure 3: Interpretation of the absolute EBEX indicator



## References

Giraud, JR. and C. D'Hondt, 2006, MiFID: "Convergence towards a Unified European Capital Markets Industry", *Risk Books*, 341 pages.

Harris, L., 2003, "Trading & Exchanges: Market Microstructure for Practitioners", *USA Oxford University Press*, 617 pages.

Lee, C. and M. Ready, 1991, "Inferring Trade Direction from Intraday Data", *Journal of Finance* 46, 733-746.

Lee, C. and B. Radhakrishna, 2000, "Inferring Investor Behavior: Evidence from TORQ data", *Journal of Financial Markets* 3, 83-111.

Odders-White, E., 2000, "On the Occurrence and Consequences of Inaccurate Trade Classification", *Journal of Financial Markets* 3, 259-286.

Piowar, M. and L. Wei, 2006, "The Sensitivity of Effective Spreads Estimates to Trade-Quote Matching Algorithms", *Electronic Markets* 16 (2), 112-129.

Theissen, E. 2001, "A Test of the Accuracy of the Lee and Ready Trade Classification Algorithm", *Journal of International Financial Markets, Institutions and Money* 11, 147-165.





EDHEC is one of the top five business schools in France owing to the high quality of its academic staff (100 permanent lecturers from France and abroad) and its privileged relationship with professionals that the school has been developing since it was established in 1906. EDHEC Business School has decided to draw on its extensive knowledge of the professional environment and has therefore concentrated its research on themes that satisfy the needs of professionals.

EDHEC pursues an active research policy in the field of finance. Its **Risk and Asset Management Research Centre** carries out numerous research programmes in the areas of asset allocation and risk management in both the traditional and alternative investment universes.

Copyright © 2007 EDHEC

