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MiFID
Spirit and Reality of a European Financial Markets Directive

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MiFID

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Content

Executive Summary

MiFID's key objectives are market efficiency, market integrity, and fairness. By defining a new trading venue classification (i.e., Regulated Markets, Multilateral Trading Facilities, and systematic internalisers) and by enabling these venues to compete on a level playing field in terms of fees, services, and technology, the Directive tries to encourage innovation, reduce explicit and implicit trading costs for investors, and reduce the cost of capital for issuers.

However, in practice, the OTC side of the market has not been touched by the MiFID regulation. The status of European markets reveals that the competition between Regulated Markets and the newly emerged MTFs works. However, there are only a few investment firms that are registered as systematic internalisers, and transactions carried out on an OTC basis represent a significant (around 40%) and stable part of the trading volume in the European equity market.

In reality, trading activity currently reported as OTC activity is very different from the original MiFID intention. MiFID characterizes OTC transactions in Recital 53 as transactions that cumulatively fulfill the requirements of being ad hoc and irregular, carried out with wholesale counterparties, above standard market size, and conducted outside systems used for systematic internalization. However, our analysis of individual OTC trade size data between January 2008 and April 2010 both for high liquids (EURO STOXX 50 constituents) and a sample of less liquid securities shows that a significant share of OTC transactions are neither above SMS nor would they face market impact if concluded on open, public order books.

Implementation of trading technologies has reinforced the sensitivity of market data. The reduction of average transaction sizes in the various liquidity pools and the implementation of trading technology that is leveraging market data to execute profitable trading tactics have reinforced the willingness of buy side firms to hide their trading strategy by limiting information leakage while capturing as much information about the trading patterns of their counterparts as possible. This situation conjugated with the desire to decrease execution cost by trading at midpoint explains the quick adoption of non-displayed pools of liquidity by European investors.

Broker/Dealer Crossing Networks (BDCNs) are a positive evolution of the OTC market, but a vast majority of their operations should be regulated as a MiFID trading venue. The benefits of bringing the OTC market towards electronic trading are numerous: trade capture is simpler and can be automated; trade affirmation and confirmation are easier; and regulatory reporting requirements are easier to fulfill. Nevertheless, one should question why those broker/dealers that are providing the same type of services as a systematic internaliser or dark pool MTF are not regulated in

the same way as these MiFID venues. Therefore, the fact that BDCNs are currently considered OTC transactions is to a certain extent a breach of competition, since they provide mostly the same services as the regulated venues without the commensurate regulatory burden.

Reliance on OTC market operations should be closely supervised. With negotiation happening in the OTC space, if the trading volume executed on this segment of the market continues to increase, the price discovery mechanism happening on the "lit" market could be severely impacted. Eventually we could see the European equity market becoming more aligned with the fixed income and FX ones. These are functioning, quote-driven markets but with very limited retail direct participation and a high level of concentration, with the vast majority of transactions being handled by a limited number of sell side institutions.

The development of BDCNs creates second class investors. Unlike RMs or MTFs, which have to provide open and nondiscriminatory access, BDCNs are limiting access to the existing members of the networks and customers of the broker/dealers, which indirectly penalizes the buy side firms that are not customers of the BDCN operator. While the restriction of BDCN access to customers is most relevant from a BDCN operator point of view (it is an added service provided to customers and therefore a competitive differentiator), it is nonetheless in contrast to the MiFID intention of promoting fair access in the European cash equity market.

The significant level of OTC activity and the development of BDCNs create some serious market surveillance concerns. Broker/dealers are a very regulated community, and they have to conduct some significant customer activities and order surveillance operations. However, they do not conduct any venue surveillance activity, as regulated trading venues do, and since they do not provide any pre-trade transparency either, the opportunity for an investor to conduct market abuse and market manipulation activities across the various untransparent and unmonitored liquidity pools has increased significantly.

The key MiFID principle of functional regulation should be safeguarded. Given that functional regulation is a key concept of MIFID (and much of EU financial regulation), the regulatory classification of BDCNs should be firmly based on a functional approach. The implementation of a threshold approach for BDCNs currently discussed in the context of the MiFID review would enable these execution venues to leverage their flexibility and adaptability for regulatory arbitrage and would put other MIFID trading venues (e.g., smaller MTFs) that have to fulfill the full range of requirements at a significant competitive disadvantage. The concept of a threshold also contradicts the policy rationale of well-regulated and supervised liquidity pools in Europe; even if such venues were to remain individually small, collectively they could undermine price formation and fairness if not subject to venue rules; moreover, certain risks—such as market abuse—would arise even in small venues. In addition, such a threshold would significantly increase the level of regulatory uncertainties faced by the business model of BDCNs.

This report is the result of joint research conducted by Peter Gomber, who holds the Chair of Business Administration, especially e-Finance at the Faculty of Economics and Business Administration, University of Frankfurt, and Axel Pierron who is Senior Vice President of Celent in charge of European research practice (please see the full biographies of the authors page 91).

Objectives of the Markets in Financial Instruments Directive

"The European Commission has presented a proposal for a new Directive on investment services and regulated markets. […] It seeks to establish, for the first time, a comprehensive regulatory framework governing the organised execution of investor transactions by exchanges, other trading systems and investment firms. Once adopted, the proposed Directive will uphold the integrity and transparency of EU markets and foster competition between traditional exchanges and other trading systems, with the effect of encouraging innovation, reducing trading costs and releasing more funds for investment, ultimately boosting economic growth."[1]

Today, more than eight years after this initial press statement by the European Commission, more than six years after the Markets in Financial Instruments Directive (MiFID)[2] was published and more than two and a half years after its initial application, new competition based on the regulatory framework provided by MiFID has changed the European securities industry significantly: While secondary markets in Europe were traditionally operated mainly by national exchanges, now a multitude of new Multilateral Trading Facilities (MTFs) are offering pan-European trading with a broad range of functionalities at competitive explicit trading costs. Meanwhile, three MTFs (Chi-X, BATS, and Turquoise) are among the 10 largest European equity markets in terms of traded volume. Furthermore, a limited number of systematic internalisers execute client orders against their own trading book and a significant part of overall trading can be allocated to executions taking place on an OTC basis, including in-house executions that are commonly subsumed under the term Broker/dealer Crossing Networks[3] (BDCNs).

1. European Commission (2002).
2. European Union (2004).
3. Definitions of Broker/dealer Crossing Networks are provided by CESR: "For purposes of the fact finding, broker operated crossing systems/processes were defined as internal electronic matching systems operated by an investment firm that execute client orders against other client orders or house account orders." (CESR 2010c, p. 27) and by Markit: "A Broker Crossing System is defined as an internal automated process operated by a broker/dealer that matches buy and sell orders on a discretionary intra-spread basis within a pricing methodology referencing an appropriate BBO." Markit (2010)

MiFID was implemented based on the *Lamfalussy Process*[1] and has to be applied by Regulated Markets and investment firms since November 1 2007. In 2010, the European Commission is performing a review on the effectiveness of the MiFID provisions (Paulis, 2009).

The intention of MiFID is to harmonize regulation on a European level, to increase transparency and accessibility of markets, to ensure efficient price discovery processes, and to increase investor protection. A level playing field among different types of execution mechanisms shall assure competition and foster innovation. Three main drivers within MiFID can be identified that bring movement into the securities markets, namely the classification of trading venues, the provisions regarding pre- and post-trade transparency, and the obligations for best execution.

The key challenge of the Directive is to simultaneously provide for market efficiency and market integrity, on the one hand, and competition among execution venues, on the other hand. Competition in the "market for markets" fosters market innovation in terms of technology, business, and market models as well as with regard to the services provided by the respective execution venue. Furthermore, it shall provide choice for market users. Nevertheless, competition implies market fragmentation, which tends to reduce market liquidity and to increase investors' and intermediaries' trading costs compared to a central and consolidated marketplace. Although new technologies like smart order routing engines and liquidity aggregation mechanisms try to overcome the existing venue and market data fragmentation by virtually consolidating markets at the investors' front ends and execution machines, investors and issuers articulate concerns whether this new landscape might reduce market quality, market integrity, and market transparency for the sake of competition on explicit trading fees leading to negative effects for the price discovery process and the overall efficiency of European equity markets.

The goal of the study at hand is to describe the objectives of MiFID and compare them with the status quo and the evolution of the European equity trading landscape with a specific focus on the role of the different categories of execution venues. After the initial description of the overall objectives of the Directive in this introduction, the paper will describe the MiFID venue classification approach and assess this intended setup against the reality of European equity markets as of early 2010. The next section will focus on the competitive dynamics in and the fragmentation of the European securities trading landscape that came along with the introduction of MiFID. Then the main fric-

1. The Lamfalussy Process subdivides the regulatory process into four steps named Levels. On Level 1, a directive (here: MiFID) providing framework principles was adopted by the European Council and the European Parliament based on a proposal of the Commission after intensive market consultations. The Level 1 directive defines the scope of the required implementation measures that are specified in Level 2. The EU Commission was responsible for the Level 2 process and was advised and supported by the Committee of European Securities Regulators (CESR) and the European Securities Committee (ESC). The implementation measures for MiFID were provided in the form of both a directive (European Commission (2006a); in the following: Level 2 Directive) and a regulation (European Commission (2006b); in the following: Level 2 Regulation) in 2006. Regulations are directly effective in all EU member states whereas directives need to be transposed into national law by the respective member state. In Level 3, CESR supervises the implementation process in the EU member states and finally in Level 4 of the Lamfalussy Process, the correctness of the national implementation is enforced by the EU Commission.

tion points are described, with a specific focus on the differences between trading processes in dark and lit markets covering market transparency issues and addressing execution types in OTC markets as well as venue access and surveillance issues. The final section gives a summary of the findings and proposals for possible future regulatory adaptations and enhancements.

Venue Classification

Before the enforcement of MiFID, securities trading in the EU was primarily influenced and regulated by national law. The predecessor of MiFID, the Investment Services Directive (ISD)[1] of 1993, enabled member states to regulate many details concerning securities trading at their own discretion, because it provided framework legislation that was not accompanied by further implementing measures. Therefore, regulation of securities trading was not consistent throughout the EU.

A main inconsistency was given by the possibility to execute orders outside Regulated Markets: In some EU member states (e.g., Italy[2] and France[3]), a *concentration rule* forced all transactions or transactions up to a certain size to be conducted on a national exchange. In other member states (e.g., Germany[4]), a *default rule* required banks/brokers to execute orders on-exchange unless an investor opted out on a per-order basis.[5] Another group of member states (e.g., the UK or some Nordic countries) had neither a concentration nor a default rule. Here, executing orders outside a Regulated Market or order internalisation (i.e., a broker fills its clients' orders against its own trading book) was generally possible.

Classification of Trading Venues by MiFID

Trading venues[6] are explicitly classified by MiFID into *Regulated Markets* (RM), *Multilateral Trading Facilities* (MTFs), or *Systematic Internalisers* (SIs) (see Figure 1 on page 11). Regulated Markets were already defined[7] in the ISD of 1993 and correspond to the traditional exchanges' trading setups. In MiFID they are defined as *"a multilateral system operated and/or managed by a market operator, which brings together or facilitates the bringing together of multiple third-party buying and selling interest in financial instruments—in the systems and in accordance with its non-discretionary rules—in a way that results in a contract, in respect of the financial instruments admitted to trading under its rules and/or systems, and which is authorised and functions regularly."*[8] MTFs represent a new category in European securities legislation: an MTF is defined as "*a multilateral system, operated by an investment firm or a market operator, which brings together multiple third-party buying and selling interests in*

1. European Council (1993).
2. Consob (2007), Article 32(4) and 43 (4) respectively.
3. AMF (2005), Article 516-1 and 516-2 respectively.
4. BörsG (2002), § 22 (1).
5. According to German law, retail investors had to opt out on an individual order basis, while institutional investors were enabled to opt out based on a general agreement (BörsG (2002), § 22 (1)).
6. MiFID itself (Level 1 Directive) does not explicitly define the terms trading venue or execution venue. The Level 2 Regulation (Art. 2 (8)) defines that "'trading venue' means a regulated market, MTF or systematic internaliser acting in its capacity as such, and, where appropriate, a system outside the Community with similar functions to a regulated market or MTF" and explicitly separates between executions taking place on trading venues or "otherwise" (i.e., OTC) (see Annex 1, Table 1). Therefore, we apply the Level 2 definitions in the following.
7. European Council (1993), Article 1 (13)
8. European Union (2004), Article 4 (1), 14

financial instruments—in the system and in accordance with non-discretionary rules—in a way that results in a contract,[1] which makes MTFs an analogue to the systems known as ECNs in the US.

The term non-discretionary rules is further detailed in Recital 6 of the Directive by specifying that non-discretionary rules "*set by the system operator means that they [the interests] are brought together under the system's rules or by means of the system's protocols or internal operating procedures (including procedures embodied in computer software)" and that they "leave the investment firm operating an MTF with no discretion as to how interests may interact*."[2]

MTFs can either be operated by an investment firm or by an operator of a RM and systematic internalisers (SI) are per definition investment firms; i.e., there are two institutional forms that are regulated by MiFID: RM (respectively their operators) and investment firms.

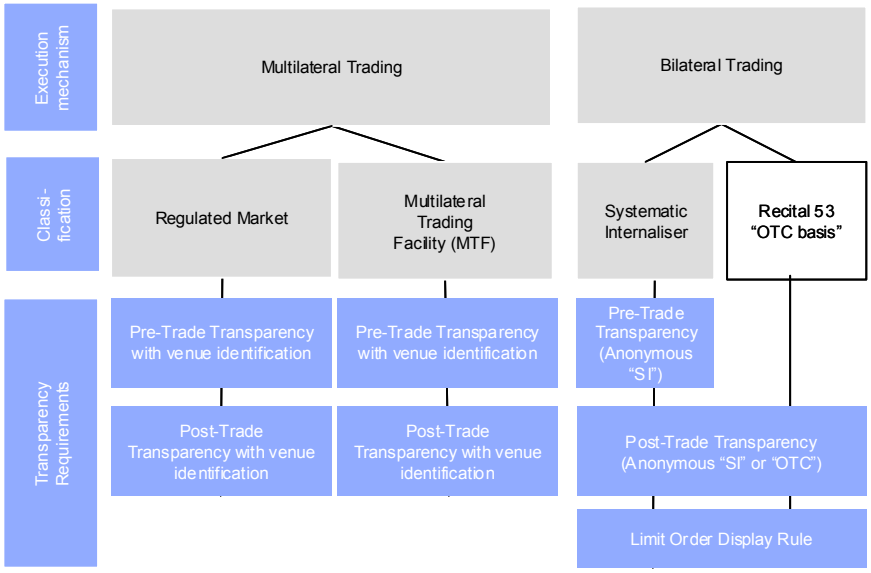
Investment firms *internalise* order flow when they fill customers' orders against their own account. This means they are the buyer to a customer's sell order and the seller to a customer's buy order and do not route their customers' orders to a RM or MTF. Internalisation follows several motivations: Besides the most obvious reason of earning the spread, investment firms internalise in order to reduce trading, clearing, and settlement fees, to exploit informational advantages, to conduct "cream skimming" (i.e., to try to separate informed and uninformed order flow), and to offer specific services like price improvement to customers (Harris 2003, Gomber & Maurer 2004).

MiFID defines a Systematic Internaliser as an "*investment firm which, on an organised, frequent and systematic basis, deals on own account by executing client orders outside a regulated market or an MTF.*"[3] If investment firms are classified as SIs, they have to fulfill further regulatory duties. Alongside post-trade transparency provisions, which are valid for all investment firms, SIs face additional quotation (i.e., pre-trade transparency) and record-keeping obligations. In order to determine whether a firm acts on an "*organized, frequent and systematic basis,"* the Level 2 Regulation provides corresponding details by listing four indicators that have to be fulfilled cumulatively[4]: (i) internalisation has to have a material commercial role for the investment firm, (ii) the business must be conducted with non-discretionary rules and procedures, (iii) the firm's activity is carried out by personnel or by means of an automated technical system provided for that purpose, and; (iv) the firm provides this service to clients on a regular or continuous basis. It is important to point out that the definition of SI does not relate to the size of orders that are internalized. Any investment firm that executes client orders on a systematic basis against own account is an SI and has to be listed as an SI. Art. 27[5] (1) of the Directive points out: "*The provisions of this Article*

1. European Union (2004), Article 4 (1), 15
2. European Union (2004), Recital 6
3. European Union (2004), Article 4 (1), 7.
4. European Commission 2006b, Article 21 (1)
5. The same thought is expressed in Recital 51: *"Article 27 does not oblige systematic internalisers to publish firm quotes in relation to transactions above standard market size.*"

shall be applicable to systematic internalisers when dealing for sizes up to standard market size. Systematic internalisers that only deal in sizes above standard market size shall not be subject to the provisions of this Article."[1] Therefore, SIs that only deal in sizes above standard market size are also covered by the SI definition and therefore need to be included in the list of SIs as required by Art. 21 (3) of the Level 2 Regulation.

Figure 1: Classification of Trading Venues by MiFID[1]



Source: Chair of e-Finance, Goethe University, Celent

1. The venue classification in MiFID has important consequences beyond transparency, i.e. execution discretion, venue access and venue surveillance that will be covered and discussed in chapter "Friction Points".

The separation between multilateral systems (i.e., RM and MTFs) on the one hand and bilateral systems (i.e., SI) on the other hand is a key concept of the MiFID trading venue classification. Recital 6 details this separation by (i) specifically requiring the alignment of RM and MTF definitions in multilateral trading and (ii) stressing that bilateral systems where the investment firm always acts as a counterparty shall be excluded from these RM and MTF definitions: "*Definitions of regulated market and MTF should be introduced and closely aligned with each other to reflect the fact that they represent the same organised trading functionality. The definitions should exclude bilateral systems where an investment firm enters into every trade on own account and not as a riskless counterparty interposed between the buyer and seller.*" [2] This concept of a separation between bilateral and multilateral trading is also stressed in Recital 44:

1. European Union (2004), Article 27(1)
2. European Union (2004), Recital 6.

"*These considerations require a comprehensive transparency regime applicable to all transactions in shares irrespective of their execution by an investment firm on a bilateral basis or through regulated markets or MTFs.*"[1]

There is a fourth category for order execution which was not explicitly classified by MiFID and which is not included in the trading venue definition of the Level 2 Regulation. It got implicitly defined in Recital 53[2] of MiFID covering transactions that are not allocated to one of the first three categories and is referred to as "*transactions carried out on an OTC basis*." Recital 53 reads as follows: *"It is not the intention of this Directive to require the application of pre-trade transparency rules to transactions carried out on an OTC basis, the characteristics of which include that they are ad-hoc and irregular and are carried out with wholesale counterparties and are part of a business relationship which is itself characterised by dealings above standard market size, and where the deals are carried out outside the systems usually used by the firm concerned for its business as a systematic internaliser.*"[3]

The Directive only uses the term OTC once, i.e., in Recital 53. Also in the Level 2 Regulation the term OTC only appears once: in the context of the list of fields for reporting purposes,[4] OTC can be used if the venue for the transaction is not a trading venue (i.e., RM, MTF, or SI).

There is an implicit link between Recital 53 and the criteria for determining whether an investment firm is an SI according to Art. 21 (3) of the Level 2 Regulation:

"The activity of dealing on own account by executing client orders shall not be treated as performed on an organised, frequent and systematic basis where the following conditions apply: (a) the activity is performed on an ad hoc and irregular bilateral basis with wholesale counterparties as part of business relationships which are themselves characterised by dealings above standard market size; (b) the transactions are carried out outside the systems habitually used by the firm concerned for any business that it carries out in the capacity of a systematic internaliser."

Recital 53 and Art. 21 (3) share some key properties that cumulatively define those transactions that are covered by the notion "OTC basis." These transactions that neither require pre-trade transparency nor define activities of a SI:

(i) *are performed on an ad-hoc and irregular bilateral basis and*

1. European Union (2004), Recital 44.
2. It is worth mentioning that Recital 53 is included in the sequence of Recitals referring to SI regulations (50-54) and clarifies the exemptions to pre-trade transparency for SIs. This sequence and the last sentence of Recital 53 can be interpreted in a way that OTC trades are exemptions from the bilateral trading activities of an SI. Given the facts, that a) MiFID does not define any trading venue definition beyond RM, MTF, and SI and b) OTC is neither defined as an execution venue nor mentioned beyond Recital 53, and c) one characteristic of OTC basis are transactions that are carried outside the systems usually used by the firm concerned for its business as a systematic internaliser, it is possible to even argue that MiFID enables for four strictly defined categories of trading (i) RM, (ii) MTF, (iii) SI executing client orders on a systematic basis, (iv) SI executing orders outside their SI systems (i.e. OTC).
3. European Union (2004), Recital 53.
4. European Union (2006b), Annex 1, Table 1.

(ii) *are carried out with wholesale counterparties and*

(iii) *are part of a business relationship which is itself characterised by dealings above standard market size and*

(iv) *are carried out outside the systems usually used by the firm concerned for its business as a systematic internaliser.*

A consequent application of requirement (i) "*are performed on an ad-hoc and irregular bilateral basis"* would exclude trading from being on an OTC basis where systems are designed, built, and implemented for that purpose because any predefined and implemented order handling process or order matching mechanism is per definition in contrast to the concept of ad hoc or irregular executions. Furthermore, due to the focus on bilateral trading, any multilateral trading (i.e., the bringing together of multiple customer orders for execution) is also not in line with OTC basis. This separation between bilateral and multilateral trading is also supported by Recitals 6 and 44 of MiFID.

Requirement (ii) "*are carried out with wholesale counterparties"* would exclude retail trading from trading on an OTC basis, and requirement (iv) *"are carried out outside the systems usually used by the firm concerned for its business as a systematic internaliser"* would require all transactions on an OTC basis to be concluded outside the SI systems.

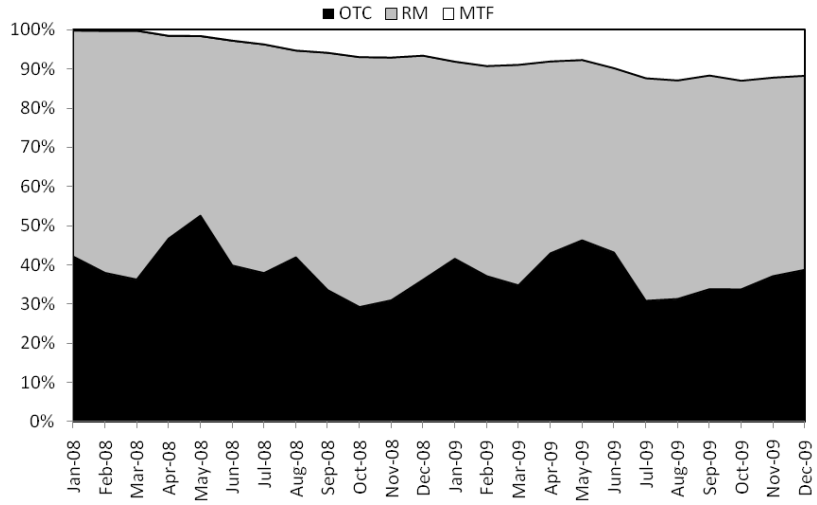
The publicly available data on transactions carried out on an OTC basis is limited to trade reporting data available according to Art. 28 MiFID. This data does not reveal the individual firm or system that executed the respective transactions, so it is not possible to investigate public data concerning the requirements (i) and (iv). Nevertheless, the investigation of the reported transactions carried out on an OTC basis provides some insight concerning the requirements (ii) i.e., "wholesale basis" and (iii) "above standard market size." Therefore, in the following chapter transactions on an OTC basis will be investigated concerning their overall extent of equities trading turnover and concerning their individual trade sizes specifically concerning the trade sizes in relation to the retail and standard market size definitions of MiFID.

Transactions carried out on OTC basis represent a significant and stable portion of the market turnover and individually are mostly in small sizes

With the advent of MiFID, the European equity trading landscape became more fragmented. As intended by the regulator, competition among market venues has increased, and available liquidity in a security is scattered among different market venues. Although the established markets in Europe (i.e., the exchanges) still keep a dominant share of equity trading in their home markets, newly emerged MTFs were able to steadily increase their share.

Figure 2 is based on data provided by Thomson Reuters and shows how European equity trading turnover[1] distributes between RM, MTFs, and OTC.[2] While the market shares of RM are constantly decreasing and a constant shift from RM to MTFs can be observed, a high and quite stable OTC trading turnover market share of around 40% can be observed.

Figure 2: Distribution of Trading Turnover Among Types of Market Venues, Based on Thomson Reuters (2008, 2009)

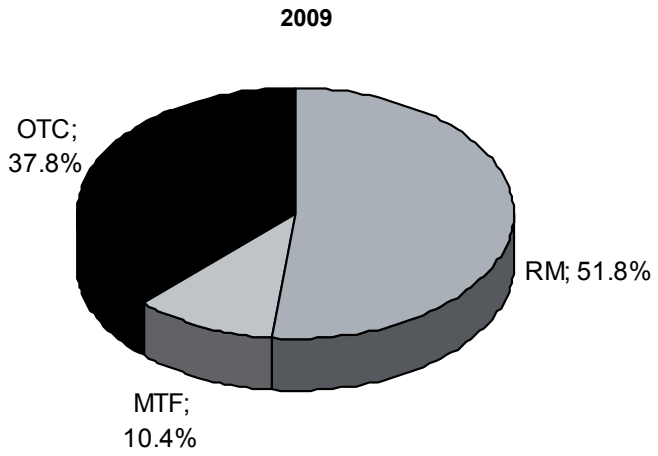


Source: Thomson Reuters

Figure 3 shows the overall distribution in 2009.[3]

1. Please note that figures presented in the following charts refer to European equities only. Figures for foreign equities traded in Europe are excluded.
2. Thomson Reuters includes SI data in OTC market shares.
3. These figures are implicitly confirmed by CESR (2010c). FESE (2010a) calculates the figures explicitly based on the CESR (2010c) paper.

Figure 3: Overall European Turnover Market Share of Different Types of Market Venues in 2009



Source: Thomson Reuters

MiFID does not define trading venues beyond RM, MTF, and SI. OTC is neither defined as a trading venue nor mentioned beyond Recital 53. Therefore, one might expect that OTC is more an exception rather than a rule in European equities trading, which however is not the case with an OTC market share in terms of turnover of around 40%.

Methodology for the Investigation of OTC Transaction Sizes Applies MiFID Parameters and a Measure for Market Impact (ANOMIS)

In order to investigate the sizes of individual transactions carried out on an OTC basis, in the following the constituents of the EURO STOXX 50 Index, a leading European blue-chip index, as well as a sample of less liquid shares from the countries included in the EURO STOXX 50, are investigated based on the trade reports provided by the Thomson Reuters Tick History.[1] From this data source, the OTC trade reports provided by Markit Boat, Xetra OTC, LSE OTC, Euronext OTC, Mercado Continuo Espanol OTC, ISE OTC, and Chi-x OTC[2] are included in the investigation covering more than

1. Given the data problems in OTC trade reports that are currently intensively discussed in the industry, the authors want to emphasize that the results derived in the following sections are based on a data input that obviously shares these general data problems (e.g., double reporting, missing or double corrections, field errors, etc.), and therefore the analysis can reflect reality only to the extent that the data source reflects reality. Furthermore, it has to be considered that there are inconsistencies between different data sources that provide OTC trade data.
2. As data on off-exchange transactions were not available for Borsa Italiana and Nasdaq OMX Nordic Helsinki, these have not been considered as OTC reporting venues.

98% of all trade reports[1] for the EURO STOXX 50 Index constituents. Concerning the investigated time frame, the analysis covers nearly the entire MiFID window from January 1, 2008 until April 30, 2010, i.e. represents a total population survey[2].

Given the two requirements of Recital 53 for transactions to be carried out on an OTC basis ((i) *are carried out with wholesale counterparties and (ii) are part of a business relationship which is itself characterised by dealings above standard market size*) that can be investigated based on public data, the following analysis will categorize empirical OTC transaction sizes (TS) applying three thresholds:

1. MiFID's definition of *Retail Size* (RS), i.e. 7.500 €, according to Art. 26 of the Level 2 Regulation which applies for all shares.
2. MiFID's definition of *Standard Market Size*s (SMS), according to Art. 23 of the Level 2 Regulation and its concrete parameters for individual shares as defined by the MiFID Database.[3]
3. MiFID's definition of *Large In Scale* (LIS) compared with normal market size, according to Annex II, Table 2 of the Level 2 Regulation and its concrete parameters for individual shares as defined by the MiFID Database.

These three thresholds define four relevant categories: (cat. i) TS < = RS, (cat. ii) RS < TS <= SMS, (cat. iii) SMS < TS <= LIS, (cat.iv) TS > LIS. All parameters are based on the current status of the MiFID Database (i.e., on the 2009 data computed by the competent authorities which were made available from April 1, 2010).[4] One might argue that these parameters are questionable given the significant reduction of trade sizes in European markets during the last years; however, it has to kept in mind that only RS is a fixed parameter with 7,500 €, while SMS and LIS are adaptive to reduced trade sizes (which is reflected in the fact that currently nearly 90% of the SMS for liquid shares are equal to the RS of 7,500 €).

1. As OTC trade reporting information only shows trade data, obviously no information on the initial order sizes at the desks of the respective buy-side or sell-side institutions that triggered the trades is available. Therefore, small trades might results from a split of a larger parent orders into multiple smaller child orders.
2. For classifying OTC trades into the various size categories and computing the descriptive statistics (mean, median, etc.) based on the Thomson Reuters Tick History raw data, a software was implemented that iterated 30 GB of 7.5 times compressed Euro STOXX 50 and less liquid trades. Each historical trade (RM and OTC) was analyzed and transferred to a special statistic data warehouse designed for this problem. Corrections were removed from the data warehouse. This analysis was made on a yearly and repeated on monthly, daily, hourly, daily, minutely, secondly scopes.
3. CESR (2010a)
4. The regulatory parameters concerning SMSs and LIS that were applied for the analysis above were extracted from the parameters of the MiFID Database as published on the first trading day of March 2010, that are based on the 2009 data collected by the competent authorities in respect of each share in the CESR MiFID Database. Both SMSs and LIS are based on the calculations of the average daily turnover (ADT), average value of the orders executed (AVT) and the average daily number of transactions. Art. 33 (2) of the Level 2 Regulation requires that "the calculation of the average daily turnover, average value of the orders executed and average daily number of transactions shall take into account all the orders executed in the Community in respect of the share in question between 1 January and 31 December of the preceding year." However, according to the "Protocol on the Operation of CESR MiFID Database" (CESR, 2010b) the ADT, AVT and number of transactions calculations as published on the first trading day of March 2010 include the trades on the regulated market or markets of the member state which is the most relevant market in terms of liquidity and the three most relevant MTFs, i.e BATS, Chi-x and Turquoise. Transactions reported by investment firms using "OTC flag" are not included in the data resulting in a systematic underestimation of SMS and LIS figures. This is also mirrored by the fact that for 87% (absolute: 623) of all liquid shares, the SMS is equal to the RS, i.e. 7,500 EUR. Further, 11% of all liquid shares have a SMS of 15,000 and only 1% (13 shares) show a SMS higher than 15,000 EUR.

Beyond these regulatory parameters and as a further contribution, it will be analysed on a trade by trade basis which individual OTC trades would be subject to market impact if concluded on the respective reference market. In the discussion on the benefits of OTC trading, the prevention of market impact is often pointed out by market participants. In order to classify OTC trades concerning their potential market impact, we developed a measure that tries to identify an average order size that would face no market impact if the respective order were to be executed on the most relevant market in terms of liquidity. This measure represents the average available quoted size at the best bid/best offer in € on the most relevant market in terms of liquidity for the respective share.

The measure is called Average NO Market Impact Size (ANOMIS).[1] Order sizes up to ANOMIS on average can be executed without facing adverse price movement, i.e., do not match limits beyond the first available limit in the order book (the BB or BO).

Here, we want to explicitly point out that we have taken a per trade/transaction perspective and asked how many trades are above or below the different parameters (which is consistent with the MiFID Recital 53 perspective: *"application of pre-trade transparency rules to transactions carried out on an OTC basis, the characteristics of which include that they are ...")*. If, for example, one were to count which share of the total OTC volume is above or below these parameters, the dominance of a few very large OTC trades would lead to significantly different results. However, MiFID is right in looking at the individual transactions/trades because it is the individual trade/order that is relevant for price discovery.

In order to enable structural comparison between on-exchange and off-exchange trades, the trades on the respective primary market (most relevant market in terms of liquidity) are included in the analysis. In the following, the results of the analysis are described for highly liquid shares and for less liquid shares.

1. ANOMIS figures were computed from order book snapshots captured every five minutes. These snapshots include best bid and offer limits and the respective number of shares. Quoted values at the top of the order book were first averaged for each trading day in 2009, and eventually an average for the entire year was determined for each respective share (see Appendix). In order to come up with a conservative figure, the minimum of the quoted volume of the best bid and best ask was taken as the ANOMIS figure. As the hidden parts of iceberg orders are not included in the public data stream, factual ANOMIS figures are higher than visible ANOMIS figures (that are applied here). Furthermore, it should be noted that additional liquidity is provided by the competitors of the most relevant market in terms of liquidity. Their inclusion would further increase ANOMIS for a European consolidated book. The reduction in tick sizes that took place in late 2009 and early 2010 in the context of European tick size harmonization (FESE 2010b) and that reduced the quoted values at the best bid and offer for the affected shares is only partly reflected in the ANOMIS figures of 2009 that serve as the basis of our analysis. However, the reduction in tick size also reduces market impact in case of executions beyond the best bid and offers.

Analysis of OTC Transaction Sizes of Highly Liquid Shares: 48% of OTC Trades Below SMS and 73% Below ANOMIS

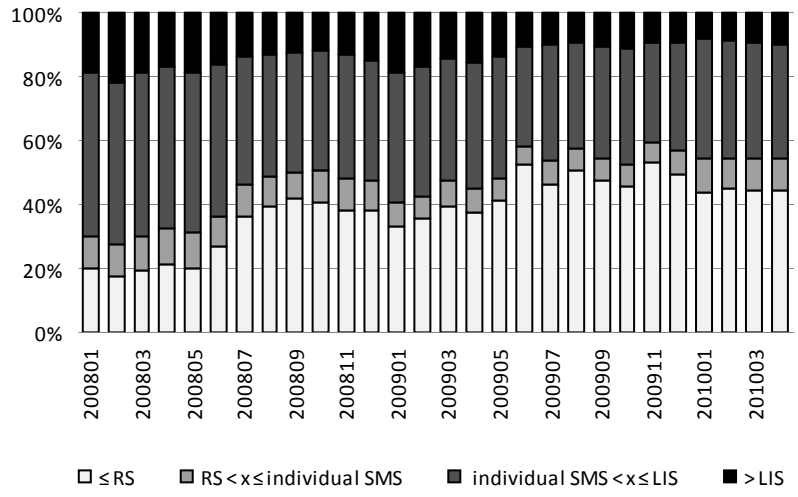
In the following, the results of the analysis are presented for the aggregate of all securities included in the EURO STOXX 50[1] as of April 30, 2010. The Appendix explains the results in detail for a randomly selected individual share (here: BASF) and lists all results for the 50 individual constituents of the EURO STOXX 50.[2]

For all EURO STOXX 50 constituents, the Thomson Reuters Tick History lists a total of 7,036,449 OTC trades between January 1, 2008 and April 30, 2010 with a total turnover of 7,010,761 EUR million.

39.35% of all OTC trades in EURO STOXX 50 constituents are below or equal to the MIFID RS of 7,500 €, further 8.77% of all OTC trades are between the RS and the respective SMS (individually computed for all EURO STOXX 50 constituents; see MiFID Database (CESR [2010a])); i.e., in total 48.12% of all OTC trades in EURO STOXX 50 constituents are below or equal to the respective SMSs. 39.03% of all OTC trades are between SMS and LIS (which is 500,000 € for all EURO STOXX 50 constituents) and 12.85% of all OTC trades are above LIS. Figure 4 shows how the split of OTC trades sizes into the various categories develops over time in the observation period. It shows that the share of OTC trades that are smaller than SMS increases from 40.73% (average for 2008) to 54.45% (average for 2010) while the share of OTC trades above LIS decreases from 15.44% (average for 2008) to 9.12% (average for 2010).

1. The EURO STOXX 50 is a leading European blue-chip index for the Eurozone. As of April, 30, 2010, the index covers 50 highly capitalized stocks from eight Eurozone countries: Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands and Spain
2. It should be noted that AB INBEV although being constituent of EURO STOXX on April, 30th 2010 was not a constituent in 2008 yet. On 18 November 2008, the combination of InBev and Anheuser-Busch closed. Therefore, the respective fields for AB INBEV are empty in Appendix Euro Stoxx 50 instruments for 2008.

Figure 4: Development of OTC Trade Sizes for EURO STOXX 50 Constituents in the Relevant Categories in the Observation Period



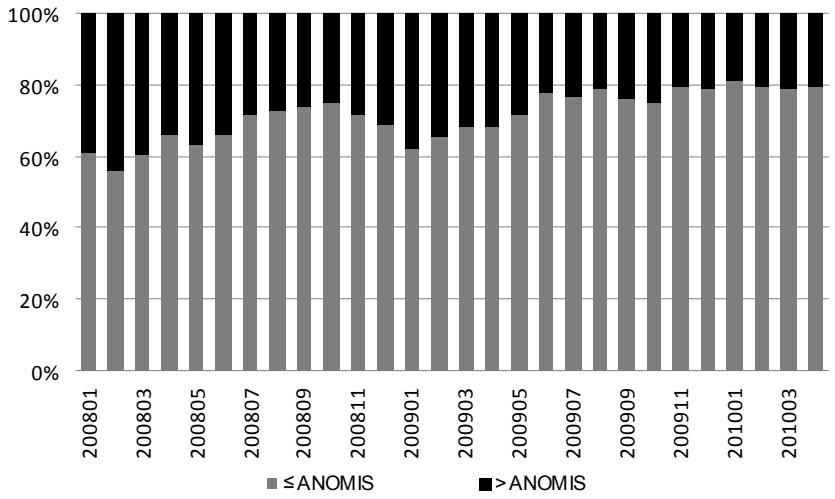
Source: Chair of e-Finance and Celent analysis

ANOMIS is applied for all individual EURO STOXX 50 constituents to identify the share of OTC trades that would face no market impact if concluded on the most relevant market in terms of liquidity, i.e., leading to executions that would (on average) match no limits beyond the best bid or best offer in the order book. For the EURO STOXX 50 constituents, in total 27.43% of all OTC trades show a size above ANOMIS (individually computed for all EURO STOXX 50 constituents[1]) while 72.57% of all OTC trades would face no market impact on average. Figure 5 on page 20 shows how the split of OTC trades sizes into the trades above and below ANOMIS develops over time in the observation period. It shows that the share of OTC trades below ANOMIS, i.e., that would face no market impact, constantly increases from 67.74% (average for 2008) to 79.70% (average for 2010). This increasing share of trade sizes

1. For the complete list of ANOMIS figures of the individual securities, see Appendix, Tables of Parameters SMS, LIS, and ANOMIS.

below ANOMIS reveals that trade sizes in OTC markets not only reduce in absolute terms but also that they reduce relative to the available liquidity in the reference markets.

Figure 5: Development of OTC Trade Sizes Above and Below ANOMIS in the Observation Period for All EURO STOXX 50 Constituents



Source: Chair of e-Finance and Celent analysis

Table 1 summarizes the EURO STOXX 50 constituents data described above for OTC trading in 2008, 2009, the first four month in 2010 and the complete observation period from January, 2008 through April, 2010 ("Total"). Further, it enables for the comparison of the OTC trades in the EURO STOXX 50 constituents to the trades on the respective most relevant markets in terms of liquidity which yields some obvious structural similarities.

Table 1: Data on the EURO STOXX 50 OTC and primary market trades for 2008, 2009, 01-04/2010 and for the complete observation period

Name/Venue	Year	Trades	Total Turnover (EUR m)	Avg Turnover (EUR)	<=RS (%)	RS<x<=SMS (%)	SMS<x<=LIS (%)	>LIS (%)	<= ANOMIS (%)	> ANOMIS (%)
EuroStoxx 50 OTC	2008	2,791,966	3,976,731.46	1,424,348.1	30.75	9.98	43.83	15.44	67.74	32.26
EuroStoxx 50 Primary Markets	2008	129,228,350	3,639,239.98	28,161.31	37.06	12.86	49.85	0.23	89.99	10.01
EuroStoxx 50 OTC	2009	2,928,411	2,200,140.11	751,308.51	45.32	7.01	35.63	12.05	73.98	26.02
EuroStoxx 50 Primary Markets	2009	118,643,111	2,177,355.11	18,352.14	49.75	14.66	35.48	0.11	95.71	4.29
EuroStoxx 50 OTC	2010	1,316,072	833,889.94	633,620.3	44.32	10.13	36.43	9.12	79.70	20.30
EuroStoxx 50 Primary Markets	2010	40,287,139	768,142.04	19,066.68	46.65	15.96	37.27	0.12	94.95	5.05
EuroStoxx 50 OTC	Total	7,036,449	7,010,761.51	996,349.37	39.35	8.77	39.03	12.85	72.57	27.43
EuroStoxx 50 Primary Markets	Total	288,158,600	6,584,737.14	22,851.09	43.63	14.03	42.17	0.17	93.04	6.96

Source: Chair of e-Finance and Celent analysis

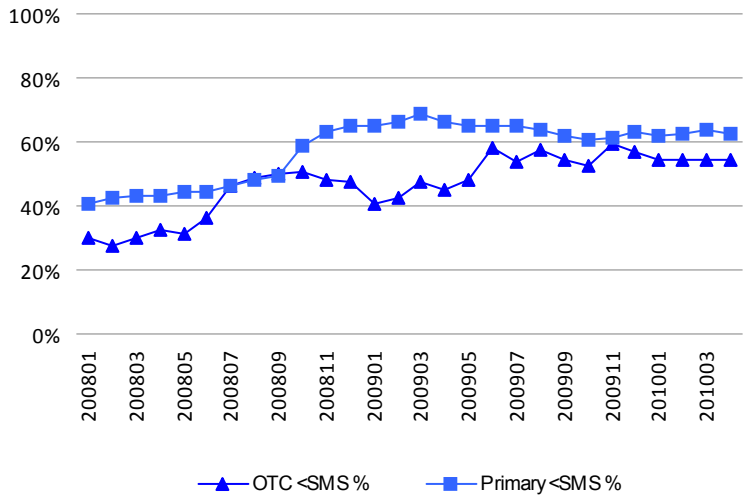
On the respective most relevant markets in terms of liquidity for all EURO STOXX 50 constituents, a total of 288,158,600 trades with a total turnover of 6,584,737 EUR million between January 1, 2008 and April 30, 2010 were observed.

Due to some OTC trades at significant volumes, the share of OTC number of trades to total number of trades (OTC plus primary markets) is 2.4% (while the OTC share in terms of total turnover is 51%), and the average turnover in EURO STOXX 50 constituents in OTC trading with 996,349.37 € is significantly higher than on the primary markets with 22,851.09 €. The share of OTC trades above LIS (12.85%) is obviously higher than the share of primary market trades above LIS (0.17%). However, the median turnover (the 50th percentile), i.e., the turnover value in € below which 50% of all observations can be found, is 8,405 € in the OTC market and 5,805 € on the primary markets.[1]

The share of trades below SMS (48.12% OTC and 57.66% on primary markets) and below ANOMIS (72.57% OTC and 93.04% on primary markets) shows a similar structure between OTC and primary market trading. Figure 6 on page 22 for trades relative to SMS and Figure 7 on page 22 for trades relative to ANOMIS reveal that this observation is consistent across the observation period.

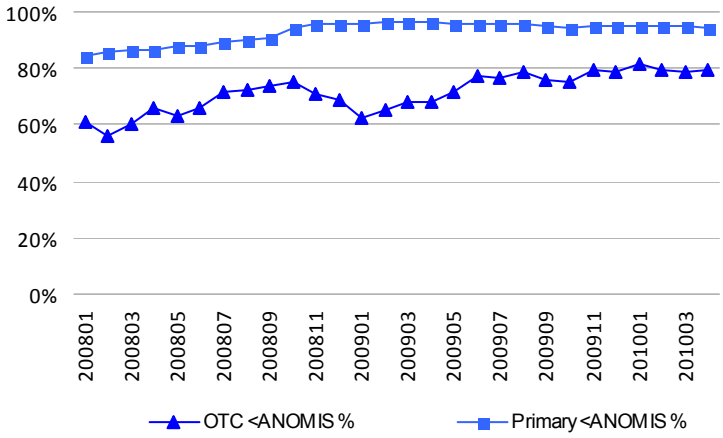
1. These values were interpolated because of implementation reasons within an interval of 10 euros.

Figure 6: Comparison of Primary Markets and OTC Trade Sizes Below SMS in the Observation Period for All EURO STOXX 50 Constituents



Source: Chair of e-Finance and Celent analysis

Figure 7: Comparison of Primary Markets and OTC Trade Sizes Below ANOMIS in the Observation Period for All EURO STOXX 50 Constituents



Source: Chair of e-Finance and Celent analysis

Analysis of OTC Transaction Size of Less Liquid Shares: 58% of OTC Trades Below SMS and 62% Below ANOMIS

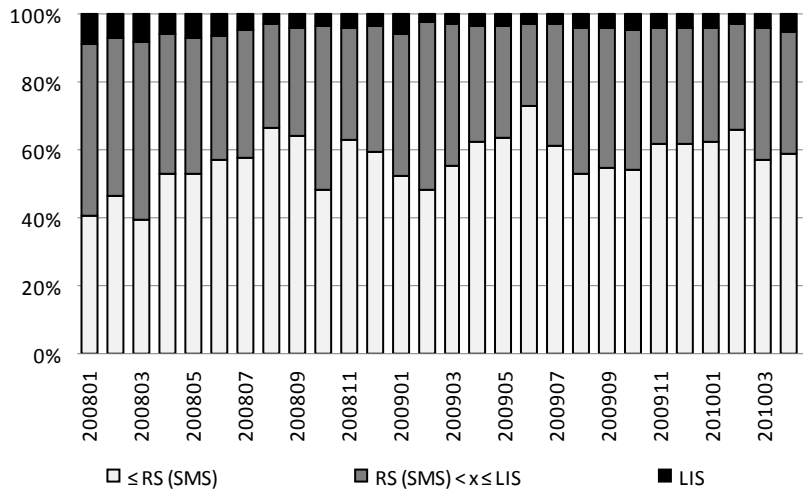
To analyze the trade size distributions in case of "less liquid stocks," for each of the eight countries contributing to the EURO STOXX 50 index, the two instruments with the smallest ADT in 2009 (according to the MiFID database) have been considered from the pool of liquid shares of the MiFID database.[1] These shares were selected because they are the least liquid among the liquid shares in the MiFID database, and for them still the relevant regulatory parameters, e.g. the SMS, are provided.

For the resulting 13 less liquid stocks, the Thomson Reuters Tick History lists a total of 87,620 OTC trades between January 1, 2008 and April 30, 2010 with a total turnover of 6,413.13 EUR million.

57.81% of all OTC trades in the less liquid stocks sample are below or equal to the MIFID RS of 7,500 €, and as the SMS equals the RS for all those stocks, 57.81% of all OTC trades in less liquids are below or equal to the respective SMSs. 37.56% of all OTC trades are between SMS and LIS (which is 250,000 € for all less liquids except for Mediq with a LIS of 100,000 €) and 4.64% of all OTC trades are above LIS. Figure 8 on page 24 shows how the split of OTC trade sizes into the various categories develops over time in the observation period. It shows that the share of OTC trades that are smaller than SMS increases from 53.46% (average for 2008) to 61.20% (average for 2010), while the share of OTC trades above LIS decreases from 5.73% (average for 2008) to 4.12% (average for 2010).

1. Irish stocks have been excluded here, as the market with the highest turnover for those stocks is the London Stock Exchange rather than the Irish Stock Exchange. The MiFID database does not reflect this fact, and thus including these shares could bias results. For Germany, the second smallest stock identified in the MiFID database are BMW preferred shares. Those might incorporate effects from the common shares listed in the German blue-chip index DAX-30, and therefore this instrument was excluded as well.

Figure 8: Development of OTC Trade Sizes for Less Liquid Stocks in the Relevant Categories in the Observation Period

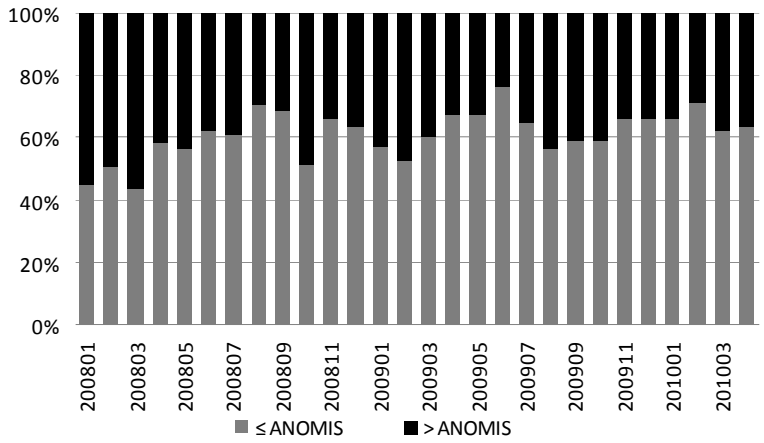


Source: Chair of e-Finance and Celent analysis

ANOMIS is applied to identify the share of OTC trades that would face no market impact if concluded on the most relevant market in terms of liquidity (i.e., leading to executions that would, on average, match no limits beyond the best bid or best offer in the order book). For the less liquid stocks, in total 38.01% of all OTC trades show a size above ANOMIS (individually computed for all less liquids[1]), while 61.99% of all OTC trades would face no market impact (on average) if concluded on the respective primary market. Figure 9 shows how the split of OTC trade sizes into the trades above and below ANOMIS develops over time in the observation period. It shows that the share of OTC trades below ANOMIS (i.e., that would face no market impact) constantly increases from 57.56% in 2008 to 65.76% in 2010.

1. For the complete list of ANOMIS figures of the individual securities see Appendix.

Figure 9: Development of OTC Trade Sizes Above and Below ANOMIS in the Observation Period for All Less Liquid Stocks



Source: Chair of e-Finance and Celent analysis

Table 2 summarizes the data for the less liquid shares described above for OTC trading in 2008, 2009, the first four months in 2010, and the complete observation period from January 2008 through April 2010 ("Total"). Further it enables the comparison of the OTC trades in the less liquid shares to the trades on the respective most relevant markets in terms of liquidity. Here, the similarities in the split of trade sizes into the different categories between OTC and primary markets trading are slightly less pronounced than they are for the highly liquid shares.

Table 2: Data on the Less Liquid Stocks OTC and Primary Market Trades for 2008, 2009, January through April 2010, and the Complete Observation Period[1]

Name/Venue	Year	Trades	Total Turnover (EURm)	Avg Turnover (EUR)	<= RS (%)	SMS<x <= LIS (%)	>LIS (%)	<= ANOMIS (%)	> ANOMIS (%)
Less Liquids OTC	2008	34,450	3,720.95	108,010.05	53.46	40.81	5.73	57.56	42.44
Less Liquids Primary Markets	2008	1,438,242	8,598.79	5,978.68	82.04	17.86	0.10	87.93	12.07
Less Liquids OTC	2009	33,606	1,588.34	47,263.62	60.29	35.89	3.81	64.34	35.66
Less Liquids Primary Markets	2009	1,574,299	6,342.86	4,029.01	88.85	11.10	0.05	92.15	7.85
Less Liquids OTC	2010	19,564	1,103.84	56,422.08	61.20	34.68	4.12	65.76	34.24
Less Liquids Primary Markets	2010	673,590	3,203.27	4,755.52	85.99	13.94	0.07	90.12	9.88
Less Liquids OTC	Total	87,620	6,413.13	73,192.52	57.81	37.56	4.64	61.99	38.01
Less Liquids Primary Markets	Total	3,686,131	18,144.92	4,922.48	85.67	14.26	0.07	90.13	9.87

Source: Chair of e-Finance and Celent analysis

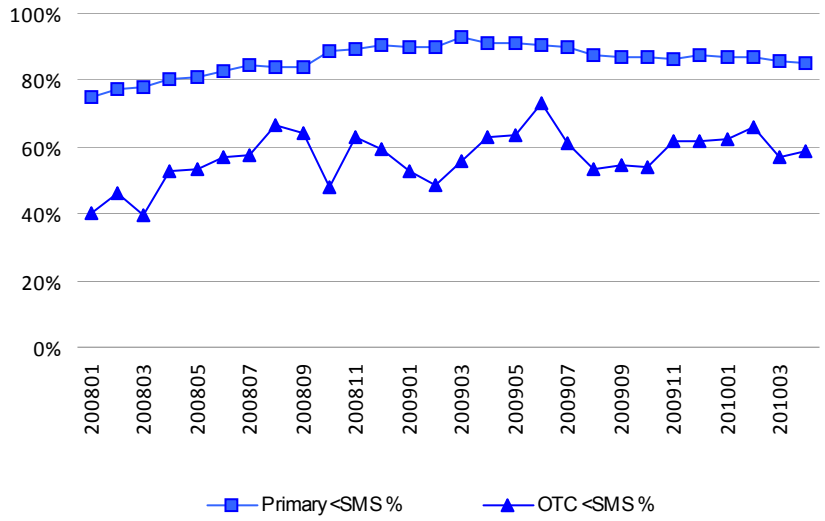
1. Please note that for all less liquid stocks, the SMS equals the RS. Therefore, in contrary to the tables above, the separation between RS and SMS in not shown neither in this table nor in the appendix

On the respective most relevant markets in terms of liquidity for all less liquid stocks, a total of 3,686,131 trades with a total turnover of 18,144.92 EURm between January 1, 2008 and April 30, 2010 were observed. Due to some OTC trades at significant volumes, the share of OTC number of trades to total number of trades (OTC plus primary markets) is 2.3% (while the OTC share in terms of total turnover is 26%) and the average turnover in OTC trading with 73,192.52 € is significantly higher than on the primary markets with 4,922.48 €. However, the median turnover (the 50th percentile), i.e., the turnover value in € below which 50% of the observations can be found, is 4,935 € in the OTC market and 2,355 € on the primary markets.

The share of trades below RS (i.e., also below SMS) for these shares, with 57.81% in OTC trading, is lower than the respective share on the primary markets (85.67%). In less liquid OTC trading, 61.99% of all trade sizes are below ANOMIS (90.13% on primary markets). This compares to 72.57% of trades below ANOMIS for the high liquids (i.e., the usage of OTC trading in less liquids to prevent market impact still can only be attributed to less than 6 out of 10 trades, but the usage seems to be more relevant than it is for the highly liquid shares). The share of OTC trades in less liquids above LIS (4.64%) is lower than the respective share for the highly liquid shares (12.85%).

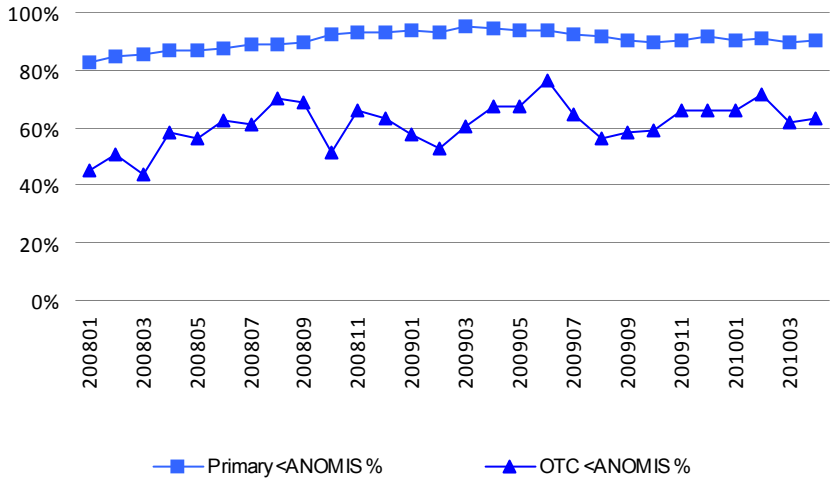
The development of the share of trades below SMS on the primary markets relative to OTC is shown in Figure 10 on page 27, while Figure 11 on page 27 shows the development of the share of trades below ANOMIS on the primary markets relative to OTC.

Figure 10: Comparison of Primary Markets and OTC Trade Sizes Below SMS in the Observation Period for the Sample of Less Liquids



Source: Chair of e-Finance and Celent analysis

Figure 11: Comparison of Primary Markets and OTC Trade Sizes Below ANOMIS in the Observation Period for the Sample of Less Liquids[1]



Source: Chair of e-Finance and Celent analysis

1. The time series for the primary markets and OTC trade sizes below SMS and below ANOMIS are very similar as—for a lot of less liquids—the ANOMIS figures are close to the SMS figures, i.e., 7,500 € (see Appendix, Tables of Parameters SMS, LIS, and ANOMIS).

Summary of the Analysis

Summing up the analysis in this chapter, the results show that transactions carried out on an OTC basis represent a relevant and stable part of the overall European equity market total turnover. MiFID characterizes OTC transactions in Recital 53 as transactions that cumulatively fulfill the requirements of being ad hoc and irregular, carried out with wholesale counterparties, above standard market size, and conducted outside systems used for systematic internalization. In the current MiFID Review discussions, a central argument for OTC trading is the minimization of market impact.

The analysis of individual OTC trade size data between January 2008 and April 2010 both for high liquids (EURO STOXX 50 constituents) and a sample of less liquid securities shows that a significant share of OTC transactions are neither above SMS nor would they face market impact if concluded on open, public order books.

In the full observation period, nearly every second OTC trade in high liquids is below SMS and nearly 6 out of 10 OTC trades in less liquids are below SMS. The share of OTC trades that are smaller than SMS increased from 40% in 2008 to 54% in 2010 in high liquids and from 53% in 2008 to 61% in 2010 in less liquids (see page 18 and 23 for details).

A new measure to identify trades that would face no market impact on the reference market (ANOMIS) was introduced. For the high (less) liquids, more than seven (six) out of ten OTC trades would face no market impact if concluded on the transparent public reference market. The share of OTC trades that would face no market impact increased from 68% in 2008 to 80% in 2010 for high liquids and from 58% in 2008 to 66% in 2010 for less liquids.

Furthermore, the analysis shows that—although the average turnover of OTC trades is significantly higher than the trades on the primary markets—the median turnover, i.e., the turnover value below which 50% of all observations can be found, is quite similar with around 8,000 euro in the OTC market and around 6,000 euro on the primary markets for high liquids. However, the situation is less similar for the less liquids, with around 5,000 euro in the OTC market and around 2,000 euro on the primary markets.

In total, the analysis yields that most OTC trades, if analysed on a trade-by-trade basis, are rather small and would not face market impact.

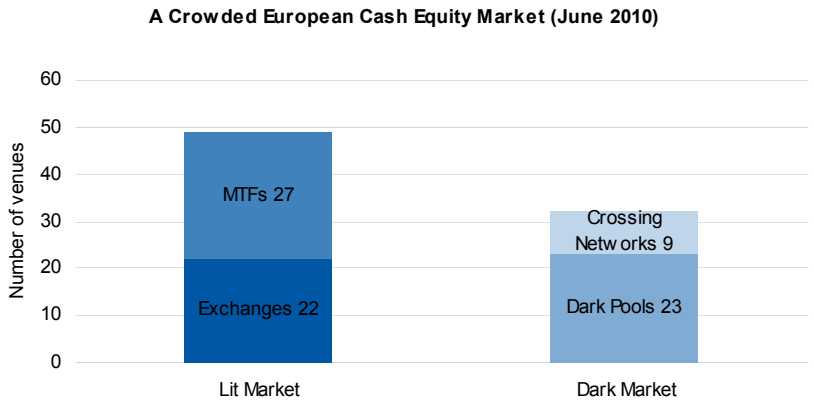
Competition and Fragmentation

The implementation of MiFID has had a tremendous impact on the structure of the European cash equity market by allowing competition to emerge in the execution platforms arena. Increase in competition and proliferation of alternative trading systems (MTFs, dark pools, systematic internalisers, BDCNs) has resulted in a large increase in options for market participants to execute their orders, and in the face of the best execution obligation imposed by MiFID, the market has seen greater fragmentation.

Increased Competition in the Trading Venue Landscape

If there is an element where MiFID has been successful, it is clearly in fostering the emergence of competition on the organized side of the European cash equity market. Since late 2007, numerous trading platforms have emerged to compete with the incumbent exchanges operating in Europe. There are currently 49 "lit" platforms operating in the European cash equity markets and 32 "dark" pools of liquidity including the nine BDCNs (see Figure 12).

Figure 12: High Level of Competition Among European Cash Equity Trading Venues

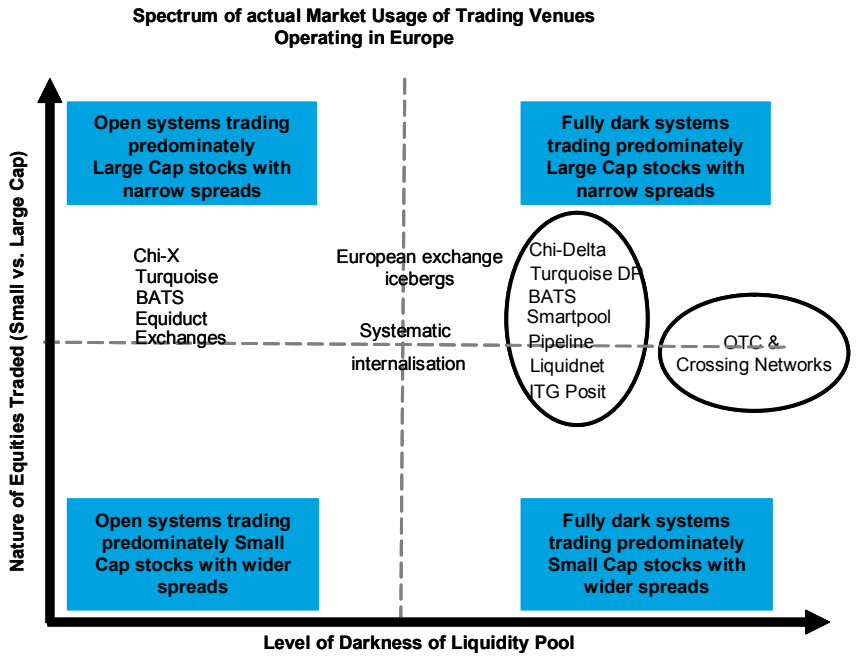


Source: Industry sources, Chair of e-Finance, Goethe University, Celent

Overcapacity of trading venues in a specific market segment. Although the number of trading venues operating in Europe has significantly increased in the past two years, there has been less creativity in the business models developed by these new platforms.

In fact, the vast majority of these venues are in direct competition and serving a similar market segment with a few exceptions (see Figure 13). Although there is a clear spread of business model between displayed and non-displayed liquidity, most venues are serving the liquid side of the market, focusing on blue chips that are obviously more likely to generate transactions than less liquid shares. There is a clear overcapacity of trading solutions available for investors that need to trade large caps; they can either trade on a regulated market or through the various MTFs, and their orders can be routed to the numerous non-displayed liquidity pools (dark venues) from dark pools to BDCNs. However, there is a limited number of solutions for trading small caps outside the relevant regulated market; to a certain extent Liquidnet, Posit, Pipeline, the systematic internalisers, and the OTC market are the only alternatives.

Figure 13: Operating Model of European Cash Equity Trading Venues



Source: Chair of e-Finance, Goethe University, Celent

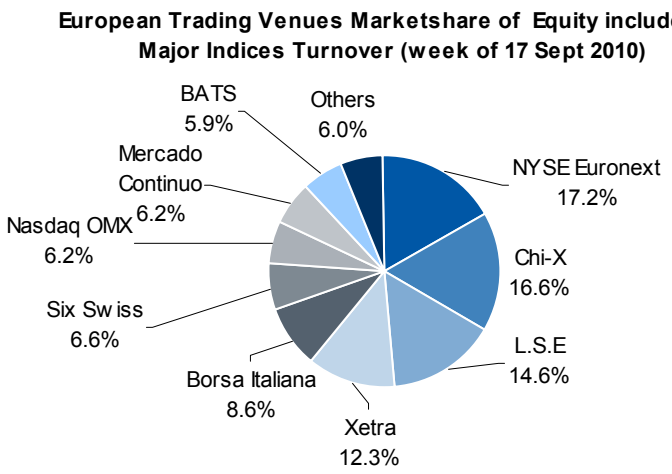
This situation could pose some serious concerns about the functioning of the cash equity market as an external source of funding for small and medium-size companies: with regulated markets facing fierce competition from other venues in the most profitable segment of the market, large caps, some industry participants question if it would be economically realistic for them to still provide quotation and trading for the small cap segment. Nevertheless, if there is a business case, the industry will presumably come up with a solution.

Fair Amount of Competition in the Lit Side

One of the main objectives of MiFID was to foster competition among order book trading venues and to challenge the incumbent regulated markets to accelerate the path of innovation, create the roots for pan-European trading venues, and decrease the trading cost to investors.

The emergence of a truly pan-European trading venue. Today, with close to 17% of the volume executed by regulated markets and MTFs on the stocks that compose European major indices,[1] Chi-X has to date emerged as a leading European trading venue in line with the regulated markets, and in a different league from the other competing MTFs that are BATS, Turquoise, etc (see Figure 14). The emergence of alternative trading venues is clearly a success of MiFID, which has been able to create the regulatory framework for the development of European trading venues able to compete with incumbent regulated markets. The positive impact of competing "lit" trading venues to the industry has been widely documented, with major benefits including: the decrease of execution fees, the development of pan-European trading venues for European blue chips, the decrease of latency of execution. In the lit side of the market, the objective of MiFID to foster competition and provide a level playing field among operators of trading venues has been mostly achieved.

Figure 14: Market Share of Leading Trading Venues in the Lit Side of the Market for the Equities that Compose European Major Indices



Source: Fidessa Fragmentation Index

1. Including: AEX, BEL 20, CAC 40, DAX, FTSE 100, FTSE 250, IBEX 35, FTSE MIB, PSI 20, SMI, OMX C20, OMX H25, OSLO OBX, ISEQ.

The Dark Venues Phenomenon

It is important to recognize that dark liquidity is a broader concept than "dark pools," with which it is usually associated in the public debate. Equity trades can be executed without pre-trade transparency in a number of ways: on RMs and MTFs when a waiver is used (dark pools), on SIs when above the SMS, and on an OTC basis (including BDCNs) because OTC is not subject to any pre-trade transparency requirement. Dark pools, which can be operated on RMs or MTFs, are only a subset of dark liquidity venues. Dark pools are blind-book markets where pre-trade transparency is limited or even absent. The mode of operating with dark pools is close to that of lit books, except that there is pre-trade information available and price discovery does happen while trading on lit books. The emergence of dark pools was envisioned by MiFID, which provided a clear regulatory framework for this venue to operate: they have to comply to the quantity waiver— orders have to be above LIS—, or the price waiver (an order has to be executed at midpoint of the reference spread in the relevant transparent trading venue) and finally the negotiated waiver. However, there is no guarantee that all orders placed on a dark venue will be executed, and the likelihood of execution on a dark pool of liquidity is lower when compared to a lit venue. It is also important to understand that dark liquidity can also reside on lit markets through the usage of iceberg orders.

1. Type of Dark Venues

The total number of global dark liquidity venues is over 50, if dealer matching and block crossing are added to the MTF DP population. As stated above, there is some confusion around the terminology used to qualify the various trading venues operating in the dark side of the market, notably due to the fact that within the EU, dark trading is usually not considered in all its forms. The discussion also gets confusing due to significant differences between definitions on both sides of the Atlantic. To avoid any misunderstanding, in this chapter, we will provide a brief definition of the terms that could be misinterpreted:

- Dark venues: Equity trades that executed without any duty to provide regulatory pre-trade transparency, either because the trade is not subject to any pre-trade transparency (i.e., OTC) or because it is subject to a requirement but a waiver is applied due to the nature or size of the trade (RM or MTF dark pools).
- Dark pools: The term dark pools is used in this report based on the MiFID trading venue classification, which is order book RMs and MTFs operating with no pre-trade transparency under the MiFID waivers. We can further segment the dark pools market according to their operator:
  - MTF-operated dark pools: These are platforms which were originally designed for block trading. They can be open to all type of market participants or restricted to a certain segment of the market. For example, Liquidnet is restricted to buy side institutions, whereas ICAP BlockCross is open to both buy side and sell side.

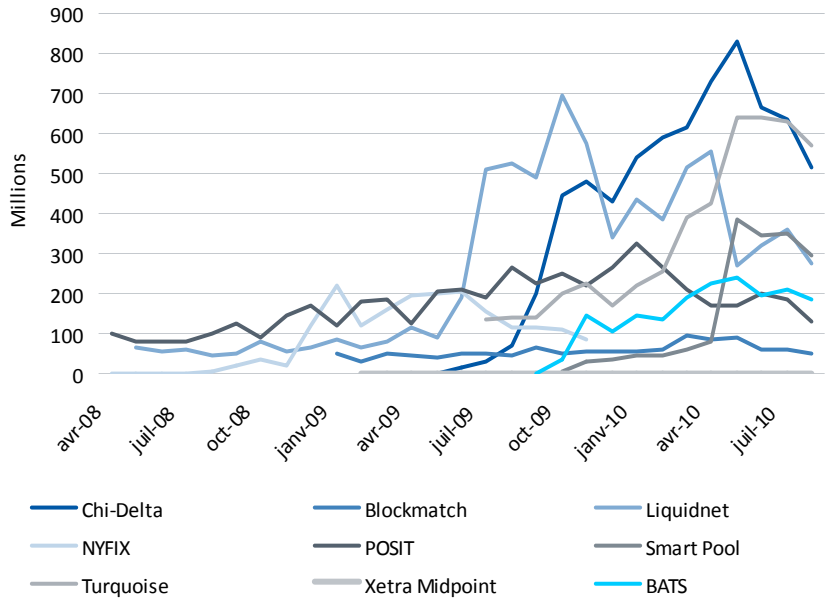
  - Regulated market-sponsored dark pools: To circumvent their loss of liquidity because of MTF dark pools, European regulated markets launched a series of dark pools during 2009. They are often aimed at small and mid cap large block transactions. While their volume has been slow to pick up, they are now gaining some significant traction. Examples of these dark venues are: NYSE Euronext SmartPool, and Turquoise after LSE's acquisition. Nevertheless, some regulated markets had launched dark pools long before the implementation of MiFID.

- OTC market: Transactions conducted in the OTC market have also been included in the non-displayed side of the market. This assumption is valid to the extent that the OTC market is not under any obligation to provide any pre-trade transparency and is a pool of non-displayed pools of liquidity. As mentioned previously, BDCN transactions are considered OTC trades from a regulatory perspective; however, for the purpose of this analysis, unless stated otherwise, we will exclude BDCN transactions from the OTC market.
- BDCNs: A few sell side institutions, by combining all their order flow from customers, prop desk trading activity, etc., have enough "internal liquidity" to create an efficient matching engine, often called crossing network. These BDCNs are not limited to block trading and allow execution of all orders from retail to institutional clients and algos. Goldman Sachs Sigma and Credit Suisse Crossfinder are good examples of BDCNs. The transactions that are conducted on these crossing networks are currently considered OTC trades. Similarly to the OTC transactions, some price discovery can occur in the crossing network platform. We will discuss the issue posed by this lack of regulatory framework for BDCN later in the report.

2. Non-Displayed Liquidity Pools Gaining Traction

The dark pools phenomenon is in its infancy in the European cash equity market compared to its US counterpart, but it is clearly gaining some significant traction. In fact, the majority of MTF DPs have experienced a significant increase in trading volume executed through their platforms from September 2009 to April 2010 (see Figure 15). Therefore one can assume that the volume executed through these venues has not yet reached a ceiling and is likely to increase sharply in the future, notably because the incentives for investors to trade through non-displayed liquidity pools are significant.

Figure 15: Historical Trading Volume Executed in the European Dark Pools (Number of Shares)



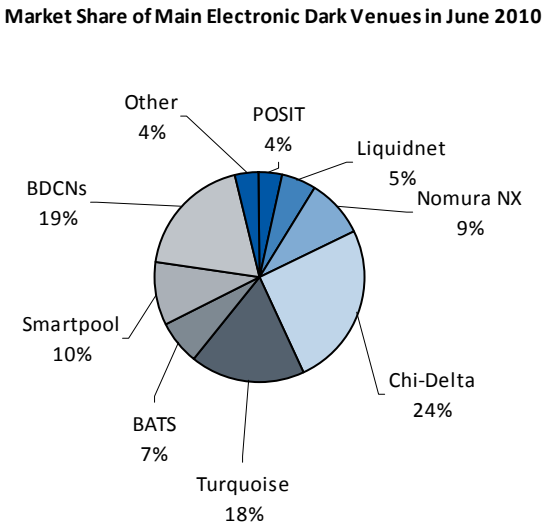
Source: Thomson Reuters

If BDCN volumes were added to dark pool volumes and to the dark liquidity sitting in regulated market order books (e.g., iceberg orders), we estimate that around 6.8%[1] of the European cash equity market trading volume is now executed in non-displayed pools of liquidity.

BDCNs represent a significant portion of the volume executed in electronic dark venues. Volume executed on BDCNs is considered OTC trading and is not regulated as DP; we have nevertheless decided to include it in our analysis of overall dark venue market share, since they are electronic trading venues of non-displayed liquidity pool. Chi-Delta is the leading MTF dark pool in Europe, with a market share of 24%. Turquoise and SmartPool follow with market shares of 18% and 10% respectively at the end of June 2010. However, all the BDCNs put together form a significant portion of the market, with a share of 19%[2] (see Figure 16), with the bulk of the volume being executed on Citi Match platform and Credit Suisse Crossfinder.

1. Figure is average for 2009 and is extracted from the CESR Technical Advice to the European Commission in the Context of the MiFID Review and Responses to the European Commission Request for Additional Information- July 2010. The share of non-displayed trading on RMs and MTFs as a percentage of total trading (including all types of venues) is not provided explicitly in the CESR document; however, it can be easily calculated based on figures provided explicitly by CESR in this report. When presenting percentages, CESR instead provides the share of non-displayed trading as a percentage of RM and MTF trading (which is 9% for 2009). The estimate of 6.8% is calculated adding the share of non-displayed trading on RMs and MTFs (5.6%) to the share of BDCNs (1.2%).
2. This figure is build using different sources of raw data (Markit Boat and Thomson Reuters), therefore while it provides a relevant estimate of market share, the data provided by the two sources might not be fully comparable.

Figure 16: Market Share of Leading European Dark Venues



Source: Thomson Reuters, MarkitBoat, Celent estimates

The current loophole under which BDCNs operate creates a breach of fair competition for regulated MTF dark pools since they do have to comply with the regulatory burden imposed by MiFID to dark pool operations, such as the waivers. Acknowledging the BDCNs market share of the overall dark pool executed volume, the situation should neither be minimized nor disregarded.

3. Rationale for Trading in Dark Venues

There are three main reasons for routing orders towards a dark liquidity venue rather than toward the lit market:

- Limit market impact: Transactions above a certain size tend to be executed on the dark side of the equity market to minimize market impact.
- Limit information leakage: The anonymity that is integral to the dark pool environment is valued by investors that are concerned not only about market impact but also about information leakage to other market participants. The discrepancies in the adoption of sophisticated algo trading tools by buy side firms have certainly reinforced investors' concerns about information leakage. While numerous buy side firms in Europe have relied on the algo trading provided by their brokers with little customization, they are confronted with counterparts that have a much more sophisticated approach to computer-driven trading and are able to take advantage of the predictability of the majority of the trading strategies used by traditional buy side firms. Therefore, the development of the dark side of the market

should be evaluated very carefully, since it is fostering the information asymmetry in the market and favors informed traders over other classes of investors.

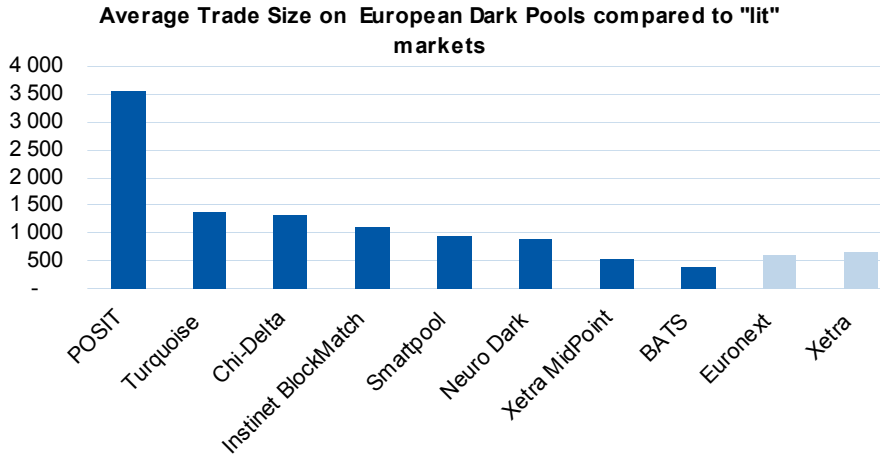
- Price improvement: In addition to anonymity, there is an evident advantage for traders to execute their orders on dark pools/BDCNs versus lit order books of the incumbent regulated markets: they save the cost of the bid/ask spread. In dark pools and BDCNs, the transaction price is often built at the midpoint of the best bid and offer quote on the relevant regulated market. Dr. Ray, in his paper "A Match in the Dark: Understanding Crossing Network Liquidity," provides evidence of the correlation between spread size and usage of dark pools / crossing networks. In short, the probability of using DP/BDCN increases with the relative bid ask spread, while overall levels of the relative bid ask spread are low. However, the probability of using DP/BDCNs decreases with the relative bid ask spread when overall levels of relative bid ask spreads are higher, and gaming concerns are a factor in the liquidity trader's routing decision.

The OTC market provides some additional benefits to buy side firms that need to execute their orders in dark venues:

- Likelihood of execution: Large institutions that need to conduct a portfolio rebalancing are very likely to generate significant market impact and adverse price movement that would significantly harm the performance of their portfolio. In theory, these buy side firms could turn to the dark pools to unwind their position, but in reality the shallow liquidity available in these venues limits the likelihood of execution of such transactions. The adoption of sophisticated trading tools allows an efficient slicing and disseminating of orders among various liquidity pools in order to hide trading intention. However, in the case of portfolio rebalancing, the value of the transactions would require multiple trading days for such a strategy to be efficient, and obviously timing is critical for a buy side firm who needs to limit the odds of the market moving against him. In fact, in the case of portfolio rebalancing, reliance on the OTC market is the most efficient approach.
- Negotiation: The main reason for the trades to be conducted OTC is the negotiation functionalities available in the OTC market. We have seen that a significant amount of transactions that are conducted OTC are not above standard market size and would have limited market impact. This is especially true for active orders, also called marketable orders, that would be otherwise executed at the best bid/ask price available in the order book driving the buy side to support the full spread cost. Executing these orders in the OTC market allows an investor to negotiate the price against its counterpart, be it the dealer prop desk or another counterparty, and therefore reduce the spread cost incurred by this active order.

Today, a majority of transactions executed in dark pools are small. Dark liquidity pools were initially used by traders for posting large block orders under the quantity waiver, as a tool to limit market impact. However, that is no longer the case. Investors are happy to execute smaller transactions at midpoint on a dark pool rather than support the spread on an open book venue. Except for Liquidnet and BlockCross, which have an average trade size of close to 200,000 shares, and to a lesser extent ITG POSIT with over 3,500 shares per trade, the majority of dark pools have an average trade size in line with those of the lit markets (see Figure 17). Therefore it demonstrates that the ability to conduct block trades and minimize market impact is not what is driving investors to use dark pools. This situation also prevails in the OTC market, as we demonstrated earlier in the report through the ANOMIS analysis.

Figure 17: Average Trade Size on European Dark Pools Compared to Two Continental Exchanges



Source: Thomson Reuters, Company site

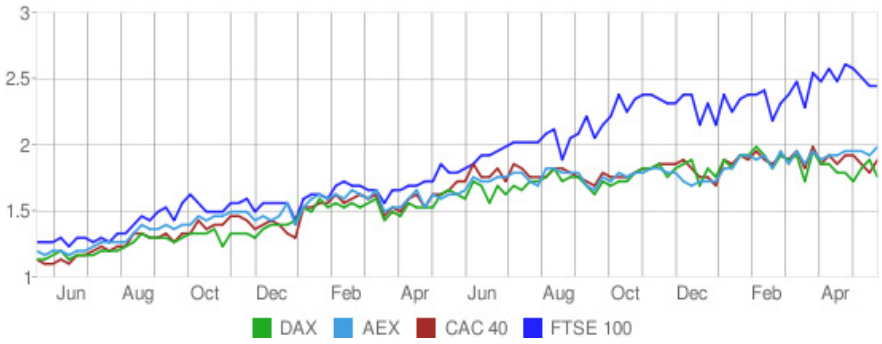
The disadvantage to trading through dark pools and BDCNs is the cost incurred by non-execution of a transaction. However, with the use of immediate or cancel orders and the possibility of disseminating orders in numerous trading venues through algorithms, this "missed opportunity" cost can be minimized.

Market Fragmentation

Emergence of New Trading Venues Has Driven Market Fragmentation

This crowded market of execution venues from regulated markets to MTFs and dark pools does not just generate some serious concerns about the sustainability of the business model of numerous of these players; the recent announcement by Nasdaq OMX of the closure of its platform Nasdaq OMX Europe in July 2010 is a clear signal that the consolidation wave might start very soon. The abundant trading venues to which investors can send their order have also driven a significant increase in fragmentation in the European cash equity market. This situation is the most acute for the liquid caps that compose the major European Indices, according to Fidessa Fragmentation Index[1] (see Figure 18 on page 38). The liquidity of the UK-listed equities that compose the FTSE100 is the most fragmented one in Europe. The situation is less sharp for the three other major European Indices—AEX, DAX, and CAC 40—but they are nevertheless following similar fragmentation trends and could eventually reach a similar level of fragmentation as the FTSE100.

Figure 18: Fragmentation of European Indices



Source: Fidessa

Fragmentation has been one driver of a reduction of average trade size. This high level of fragmentation in the European cash equity markets coupled with the adoption of algo trading has led to a significant reduction of average trade sizes that has impacted the market as a whole, from regulated markets to MTFs and OTC, as we have seen in the previous section of this report. In addition, we have seen that the reduction of transaction size has happened across the board, impacting both liquid and illiquid shares.

1. According to Fidessa: the FFI shows the average number of venues you should visit in order to achieve best execution when completing an order. So an index of 1 means that the stock is still traded at one venue. Increases in the FFI indicate a fragmentation of trading across multiple venues, and as such any firm wishing to effectively trade that security must be able to execute across more venues.

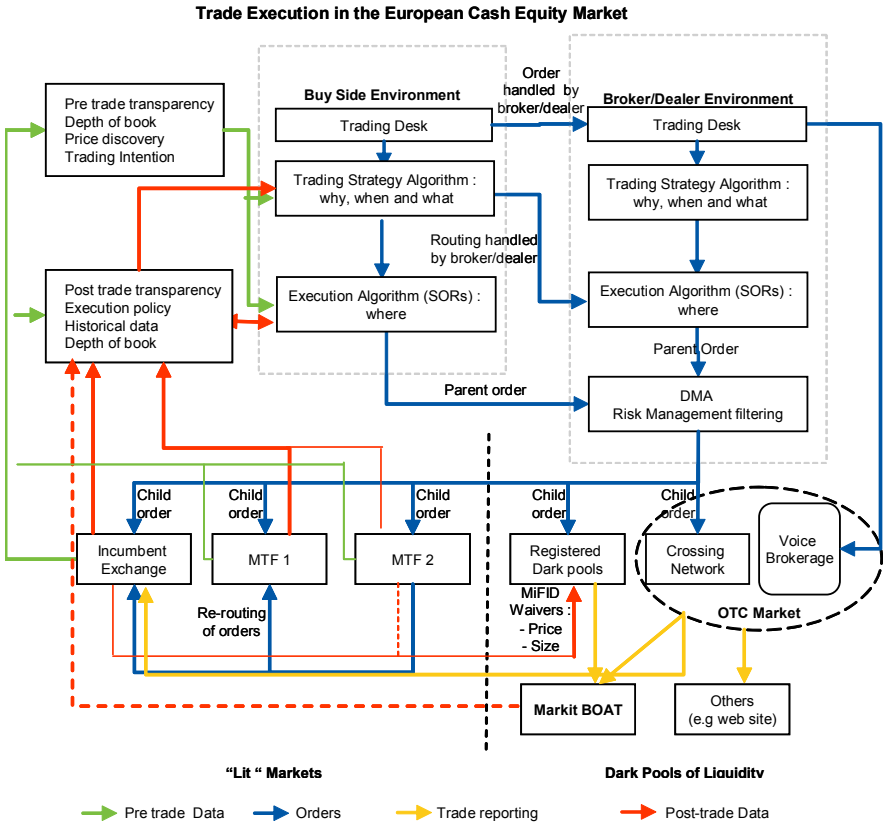
Adoption of Technology Has Been a Major Driver of Fragmentation

Competition and overcapacity in the execution venue space are not the only reasons that have driven the fragmentation of the market and the decrease of transaction sizes. The adoption of sophisticated technology has also been a major driver of this evolution. In today's capital market, a transaction is routed to the electronic order book of a regulated market or an MTF, a dark pool, a BDCN, or another type of execution platform by the principal initiating the trade, a broker who will handle the trade for its customer, or an algorithm used either by the principal or his agent. The tradeoff between turning to a dark pool and turning to a regulated market is often posed as simply as a choice between immediacy of execution vs. cost of execution. The reality is a bit different, with the increasing reliance on Order Management Systems, Execution Management Systems, Smart Order Routing Systems[1] (SORs), and algos, it is very unusual for an order to be executed as a whole in one trading venue. It is much more likely to be sliced down and sent to various liquidity pools not only to diminish market impact but also to reduce information leakage. Traders are increasingly combining the use of displayed and non-displayed liquidity to maximize liquidity capture. Therefore, once sliced down into pieces, the order will be partially executed on the primary market, MTFs, a dark pool, and a BDCN. And therefore, while the overall number of transactions increased, the size of each trade decreased.

Depending on their internal trading technological environment, buy side firms have different decision points where/when they can decide to send their order flow to their broker/dealers. If their IT trading strategy capabilities are limited, they are very likely to send their orders directly to the trading desk of the sell side that will handle the overall strategy of execution, leveraging its own technologies (algos and SORs) or providing voice brokerage services. However, some large buy side firms, with sufficient volume, have started implementing their own IT trading strategy infrastructure, developing their proprietary algos that will route orders to the sell side SOR, or even only using the direct market access (DMA) services of the sell side when they have gone as far as implementing a SOR of their own in their trading environment (see Figure 19).

1. SORs provide an automated search for fragmented liquidity across multiple venues and are capable of routing orders to the most appropriate venue combination.

Figure 19: Trading Technology Environment in the European Cash Equity Market

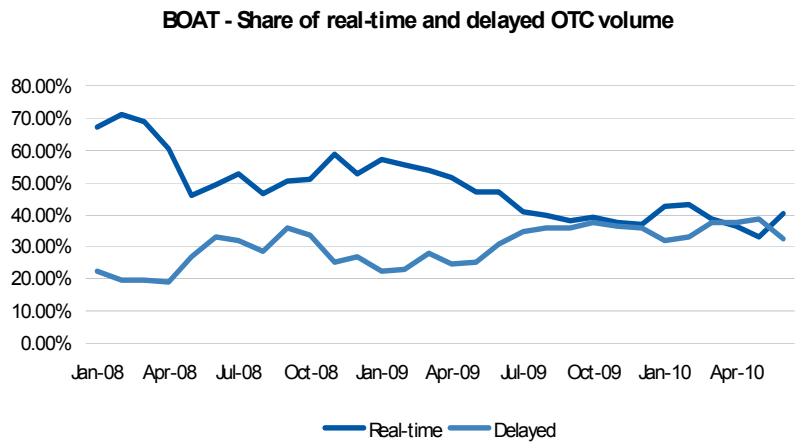


Source: Chair of e-Finance, Goethe University, Celent

Increasing importance of market information. The adoption of algorithmic trading technologies and SOR has made it even more crucial for market participants to access accurate market data in real time, since these technologies need this information to make trading, routing, and execution decisions as fast and efficient as possible. Therefore, for investors it is becoming critical to reduce the latency of market information capture while being able to hide their own trading strategy. In other words, investors are trying to capture as much information about their peers' trading patterns and strategy while minimizing their own information leakage. The main concern for numerous traditional buy side firms is to decrease their latency of execution because executing a trade too slowly exposes traders to the risk of larger pre-trade price impacts. This explains why investors are willing to disseminate their orders into various pools of liquidity, and notably the dark side of the market. In addition, investors are increasingly delaying their post-trade reporting of OTC transactions via regulated markets, MTFs, and OTC trade reporting service providers. The situation gives even more flexibility to investors in terms of hiding their trading interests, since they are able to foster informa-

tion asymmetry by avoiding pre-trade transparency as well as delaying post-trade reporting. In fact, since 2008, we've seen a clear increase of OTC volume that is reported through MarkitBOAT with a delay (see Figure 20 on page 41). Although trade sizes in OTC have dropped, we see more delays, which signals that for traders delaying is becoming more and more important.

Figure 20: Evolution of Delayed Post-Trade Reporting in European Equity OTC Market



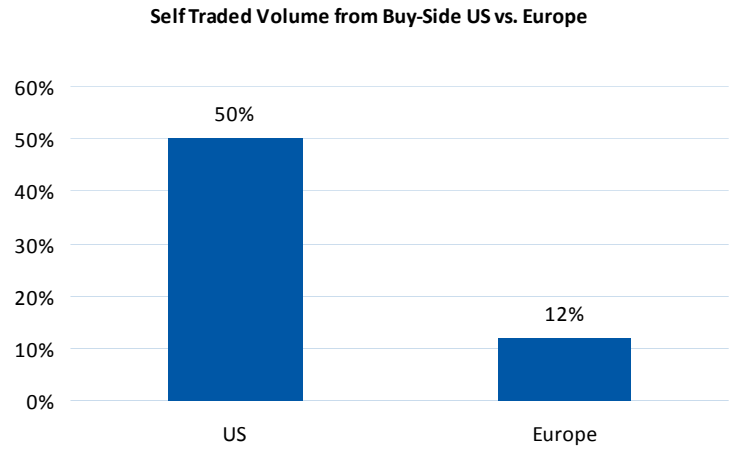
Source: Thomson Reuters

The importance of real time post-trade reporting was clearly addressed by the US regulator. The SEC has recently assessed that, with the increased reliance on SORs for order routing, disclosing the identity of venues where transactions have been executed in real time was crucial for an efficient technology liquidity-seeking process to happen. In Release N° 34-60997, the SEC proposes to amend the regulatory requirements of the Securities Exchange Act of 1934 that apply to non-public trading interest in National Market System stocks, including dark pools of liquidity to impose that "publicly disseminating consolidated trade data to require real time disclosure of the identity of dark pools and other ATS on the reports of their executed trades" in order to "promote the Exchange Act goals of transparency, fairness and efficiency."

Technology and fragmentation have reinforced the role of broker/dealers. As we have shown, it is theoretically possible for a buy side firm to duplicate the broker/dealer trading infrastructure by implementing its own trading algos and SOR and only rely on its broker/dealer for direct market access. By doing so, investors would be in total control of trading flow and diminish reliance on the sell side. However, in reality, the cost of implementing these trading technologies, coupled with the connectivity expenses transferred by the broker/dealer to connect to the various trading venues, and finally the complexity of the European post-trade infrastructure (limited CCP interoperability) are preventing most market participants from taking full control of their order

flow. Today, only 12% of European buy side firms[1] are self-trading vs. 50% in the US (see Figure 21 on page 42). This difference is also partially due to the limited number of buy side firms that are fully independent in Europe and not a subsidiary of large financial institutions that provide sell side services as well; in the US market environment, buy side and sell side are very much separate.

Figure 21: Buy Side Self-Traded Volume Europe Vs. US



Source: Celent survey

1. This statistic excludes the volume executed by the prop desk of sell side firms that are obviously self-trading a vast portion of their trading volume.

Summary of the Analysis

There is a clear overcapacity of available trading venues operating in the European cash equity market. MiFID has been successful in opening up competition to emerging trading venues to challenge incumbent regulated markets in the European equity market. However, a majority of execution platforms from "lit" MTFs to dark ones are serving the blue chip segment of the market, creating a crowded marketplace. Eventually, the number of trading venues available should diminish through consolidation and cessation of activity of unprofitable MTFs. It is also likely that currently most of the MTFs are incurring losses.

In any event, this dense market environment coupled with the adoption of trading technology such as algos of execution and SORs has driven a significant fragmentation of European equity liquidity, because orders tend to be sliced down into smaller trades which are then executed in different trading venues. This trend has generated a substantial decrease in transaction size across the various execution platforms.

The reduction of average transaction size in the various liquidity pools and the implementation of trading technology that is leveraging market data to execute profitable trading tactics have reinforced the will of buy side firms to hide their trading strategy by limiting information leakage while capturing as much information about the trading patterns of their counterparts. This situation conjugated with the desire to decrease execution cost by trading at midpoint explains the quick adoption of non-displayed pools of liquidity by European investors. We are not only witnessing an increasing volume being executed on MTFs' dark pools but also on the BDCNs, which are accounting for close to 20% of the volume executed in dark electronic venues across the European equity market in June 2010.

However, the significant cost of implementing a technology-driven trading environment has limited the development of in-house solutions by the European buy side community. Unlike their US peers, European buy side firms are highly dependent on their broker/dealers' program trading capabilities to route and execute orders in the fragmented European equity ecosystem, with only 12% of European buy side volume being self-traded. The reality is that today, broker/dealers are still in control of the majority of order flows coming from the traditional buy side firms. This situation should eventually evolve as technology implementation decreases and DMA services become widely adopted by European institutional investors.

Friction Points

There are vivid discussions whether and how current developments impact the markets. As MiFID provisions set up a level playing field across Europe for different types of markets for the first time, many new market venues have emerged, specifically new MTFs and (some) systematic internalisers as well as trading innovations in OTC markets. This relates to new trading models based on the transparency waivers provided by MiFID for Regulated Markets and MTFs, as well as new OTC execution systems that execute customer orders against each other, as well as customer orders against the broker/dealer inventory, called broker/dealer crossing networks. Against this background, the following subsections will specifically focus and elaborate on the regulatory background concerning market transparency, market access, and market surveillance and compare it to the status quo of the different types of venues and market models in the European trading landscape.

Market Transparency and Transparency Waivers

Market transparency is a central concept in MiFID. MiFID wants to achieve market efficiency, market integrity, and lower (explicit) transaction costs by means of price and service competition between different types of trading venues. However, it foresees potential negative effects of fragmentation on the efficiency of the price discovery process and tries to balance potential unintended consequences of increased competition and fragmentation by increased market transparency (both pre-trade and post-trade) combined with best execution requirements. This spirit is codified in Recital 44, which points out that these transparency requirements have to be applied independent from the actual trading venue: *"In order to enable investors or market participants to assess at any time the terms of a transaction in shares that they are considering and to verify afterwards the conditions in which it was carried out, common rules should be established for the publication of details of completed transactions in shares and for the disclosure of details of current opportunities to trade in shares. These rules are needed to ensure the effective integration of Member State equity markets, to promote the efficiency of the overall price formation process for equity instruments, and to assist the effective operation of 'best execution' obligations. These considerations require a comprehensive transparency regime applicable to all transactions in shares irrespective of their execution by an investment firm on a bilateral basis or through regulated markets or MTFs."*[1]

1. European Union (2004), Recital 44.

Pre-trade transparency requirements for MTFs and regulated markets are codified in MiFID Article 29 and Article 44 respectively and require both to "*make public current bid and offer prices and the depth of trading interests at these prices*" for shares admitted to trading on a regulated market. Concerning market transparency, most of the rules concerning MTFs are similar to those for regulated markets.[1]

The key role of market transparency for an efficient price discovery process is undisputed both by academics and by market practitioners. However, both academics and practitioners also accept that there is a need to protect a specific group of traders that would face significant negative market impact if their orders were displayed in open, transparent order books or if they executed their orders and matched multiple price levels, successively worsening their own execution price: wholesale institutional traders with large order sizes (in the following: large traders).

Therefore, MiFID has introduced protections for these traders in three dimensions: (i) for large traders using MiFID trading venues, (ii) for large traders using OTC execution, and (iii) for large traders when submitting orders to their brokers:

(i) **Large Traders Using MiFID Trading Venues**

- Exceptions for the pre-trade obligations are common to MTFs and regulated markets: MiFID Articles 29(2) and 44(2) respectively open up the possibility that the competent authorities are able to waive the obligation for MTFs and Regulated Markets to publish pre-trade information. Waiving is possible depending on the market model, type, and size of the order. Article 44 (2) emphasizes that, in particular, waiving should be enabled for transactions that are large in scale compared to the normal market size for the respective share. Concerning market models, Article 18(1) of the Level 2 Regulation concretizes the requirements for those waivers. Either the system operated by a Regulated Market or an MTF must be using a widely published and generally considered reliable reference price imported from another trading venue for its own price determination or it has to formalize negotiated transactions.[2] Concerning order types, orders that are held in an order management facility (like iceberg orders or stop orders) are also

1. Article 17 of the Level 2 Regulation further qualifies this requirement depending on the market model of the system, but regardless whether the entity is classified as a Regulated Market or as an MTF: (i) Entities operating a continuous auction order book trading system shall make public "the aggregate number of orders and of the shares those orders represent at each price level, for the five best bid and offer price levels." (ii) Entities operating a quote-driven trading system shall make public "the best bid and offer by price of each market maker in that share, together with the volumes attaching to those prices." (iii) Entities operating a periodic auction trading system shall make public "the price that would best satisfy the system's trading algorithm and the volume that would potentially be executable at that price by participants in that system." (iv) Entities that are not covered wholly by the aforementioned classifications either because they are "hybrid systems (…) or because the price determination process is of a different nature, (…) shall maintain a standard of pre-trade transparency that ensures that adequate information is made public as to the price level of orders or quotes for each share (...), as well as the level of trading interest in that share."
2. European Commission (2006b) Article 19 specifies a negotiated transaction as "a transaction involving members or participants of a regulated market or an MTF which is negotiated privately but executed within the regulated market or MTF." Those negotiated transactions have either to be made at or within the volume weighted spread for the size of the trade reflected on the order book or the quotes currently available on the system or have to be subject to conditions other than the current market price of the share.

excluded from pre-trade transparency requirements. According to MiFID provisions, competent authorities are allowed to grant the respective waivers. To ensure the harmonized appliance across the member states, CESR took responsibility for this process and continuously releases updated documents[1] that specify which practices are deemed to be eligible for a waiver according to MiFID provisions.

- The risks of exposing bigger orders to the market were also considered in the provisions for SIs, as reflected in Recital 51 (*"Article 27 does not oblige systematic internalisers to publish firm quotes in relation to transactions above standard market size*.") and then codified in Article 27.[2] Firms classified as SIs have to fulfill pre-trade transparency requirements according to Article 27 MiFID, which requires that SIs submit firm quotes to the market, i.e., bid and/or offers for a size up to the standard market size. The quotes must be close to market conditions, have to be updated continuously during normal trading hours, and must be made public in an easily accessible manner. To reflect individual business models and risk attitudes, SIs can quote smaller sizes than the standard market size. If they accept sizes bigger than the size of their published quote but smaller than the standard market size for that share, they have to stick to the published quote. If orders exceed the standard market size, SIs are not obliged to execute these orders. Orders of retail clients have to be executed at the quoted price, whereas orders from professional clients can be price improved based on predefined conditions. Firm quotes have to be published by SIs only in liquid shares. In shares that are not deemed to be liquid, SIs have to quote on request.[3] Concerning post-trade transparency, SIs are subject to the same provisions as other OTC trading.

(ii) Large Traders Using OTC Execution

- The regulations of MiFID regarding pre-trade transparency do not relate to OTC trading as defined in Recital 53. However, Recital 53 has a clear view on which transactions should be exempted from pre-trade transparency because it requires them to be ad hoc and irregular, carried out with wholesale counterparties, dealings above standard market size, and carried out outside the systems used as a systematic internaliser[4]. Before MiFID, in some countries, off-exchange transactions did not have to be reported at all (e.g., in Germany). With MiFID this has become harmonized on a European level. Price, volume, and time of a trade have to be reported as close to real time as possible, but in any case within three minutes of the relevant

1. CESR (2009).
2. "*The provisions of this Article shall be applicable to systematic internalisers when dealing for sizes up to standard market size. Systematic internalisers that only deal in sizes above standard market size shall not be subject to the provisions of this Article*." European Union (2004), Article 27.
3. Criteria for a share to be liquid are defined by EU Commission (2006b). The current list of liquid shares together with their standard market sizes is provided by CESR's MiFID database (CESR 2010a).
4. European Union (2004), Recital 53.

transaction.[1] For Regulated Markets and MTFs, the obligations concerning post-trade transparency are largely aligned.[2] For large trades (*block trades*), a deferred disclosure is possible.[3] The information must be published on a non-discriminatory commercial basis at reasonable costs and in a manner that facilitates the consolidation with similar data from other sources.[4] Potential publication channels for post-trade information are the facilities of a regulated market or MTF, the facilities of a third party, or proprietary arrangements. Based on this legislation, consortia of investment banks, exchanges, and MTFs started to offer trade reporting services. With a market share of 60.7%[5] in 2009 among the trade reporting services, Boat,[6] which was initiated by nine investment banks and then sold to Markit, is the most relevant one.

(iii) Block Traders When Submitting Orders to Brokers

- Article 22(2)[7] generally requires investment firms to undertake measures to facilitate the earliest possible execution of client limit orders by immediately publishing these orders. However, this requirement may be waived for LIS orders or in case of client instructions.

Systems that apply the above mentioned pre-trade transparency waivers already existed long before the introduction of MiFID (e.g., ITG Posit, Pipeline, or Liquidnet). Nevertheless just recently the term dark Pool emerged.[8] Many MTFs (e.g., Chi-X) and Regulated Markets (e.g., Deutsche Börse's Xetra Midpoint) are using those waivers for order execution in order matching facilities that are running in parallel to their open public order books and that don't provide pre-trade transparency. Besides these dark pools that are provided by RM and MTFs, after the implementation of MiFID a new type of dark pools emerged called BDCNs, where order execution without any pre-trade transparency is conducted by investment firms like Goldman, UBS, and Credit Suisse. These dark pools are trying to provide executions for institutional customers' (large) orders by executing them against each other, against streaming retail order flow, and against their own trading book. Thereby, they share properties of MTFs, systematic internalisers, and OTC execution venues. Nevertheless, they don't provide pre-trade or

1. If the trade happens outside normal trading hours, trade data has to be published before the market opening of the next trading day.
2. European Union (2004), Articles 30 and 45 and European Commission (2006b), Articles 27 and 29.
3. For details see European Commission (2006b), Article 28.
4. European Commission (2006b), Article 32.
5. According to Thomson Reuters (2009).
6. http://www.markit.com/en/products/data/boat/boat.page
7. "*Member States shall require that, in the case of a client limit order in respect of shares admitted to trading on a regulated market which are not immediately executed under prevailing market conditions, investment firms are, unless the client expressly instructs otherwise, to take measures to facilitate the earliest possible execution of that order by making public immediately that client limit order in a manner which is easily accessible to other market participants. Member States may decide that investment firms comply with this obligation by transmitting the client limit order to a regulated market and/or MTF. Member States shall provide that the competent authorities may waive the obligation to make public a limit order that is large in scale compared with normal market size as determined under Article 44(2).*" European Union (2004), Art. 22(2).
8. Definition of dark pools is provided by CESR: *"Although not a term defined in MIFID, in answering this question, a dark pool of liquidity (dark pool) is understood as a trading facility where there is no pre-trade transparency, i.e., where orders are not publicly displayed based on pre-trade transparency waivers provided by MIFID.*" CESR (2010c).

post trade data that allows market participants to take their trading activity into account. Merely on a post-trade level, the executions are reported with the general flag "OTC."

Dark pools and BDCNs free ride on the pre-trade data provided by regulated markets and MTFs and enable their users to achieve two major economic advantages to the detriment of investors that access public markets: (i) they are able to achieve a price improvement relative to public market users, and (ii) they are enabled to maximize their own information value in trading (i.e., see as much as possible from others but not provide information on their own trading intentions). This results in a disincentive for users to show their orders on the public marketplace and therefore weakens public price discovery and the public price formation process.

While the large in scale waiver has relevant economic justifications (i.e., protecting large trades from market impact), there is no economic justification for an isolated midpoint waiver with no minimum size requirement. Although the usage of the reference price midpoint waivers on RM and MTFs is below 1% according to CESR (2010c), only a combination of midpoint execution and minimum size is justifiable and prevents negative effects on price discovery and market transparency in the future.

OTC Execution Types and Broker/Dealer Crossing Networks

OTC markets have traditionally been organized around the broker/dealer community, which either provides a bid/ask quote to market participants leveraging its own inventory or finds counterparties willing to trade with the investors. Historically, the trading process has been conducted over the phone, allowing some negotiation to take place, and the trade was referred to as bilateral trading since only the two counterparties to the trade knew exactly the quote of execution. More recently, the broker/dealer community has leveraged its IT investments in execution technology to migrate this OTC process towards electronic platforms known as BDCNs. By doing so, they have also been able to enhance their capabilities to find multiple counterparties to fill a client order.

While regulated markets and MTFs are referred to as order-driven markets because all orders are centralized within the central limit order books, OTC markets are considered decentralized quote-driven markets since there is no consolidated view of orders and transactions are conducted on a bilateral basis based at the bid/ask quote provided by the broker/dealer.

Rationale for Conducting OTC Transactions

The value of the OTC market is very acute in the derivative space (about 80% of total volume is OTC), where the terms of contract tend to be customized and individually negotiated rather than standardized. However, OTC trading is also the dominant means of execution of more commoditized asset classes such as cash fixed income (about 90%) and spot foreign exchange market. For this standardized type of instruments, the

OTC market has during the past decades leveraged the evolution of technology to migrate from phone-based trading toward electronic platforms. It is today a trend that we are also witnessing in the European cash equity space with the emergence of BDCNs. Therefore, with the adoption of execution technology, the OTC market that used to be considered informally organized are now becoming well organized, similar to a regulated market and MTFs without the venue regulatory oversight.

The essential role of broker/dealer in the OTC market. The role of a broker is essentially to be the middleman between a buyer and a seller of a specific stock. By leveraging its customer base and contact within the industry, the broker is able to bring together two counterparties for a trade that either want to minimize market impact by trading outside the lit market or to trade at a better quote than the actual spread reported on the regulated market or MTF. The dealer provides a different service, as he takes ownership of an asset as principal and becomes the counterparty to its customers. Therefore, the dealer is exposed to some risk for which he is compensated by the spread between the price paid and the price received. In reality, dealers are generally broker/dealers and part of large banking institutions.

Broker/dealers have significant rationale to support the development of BDCNs and OTC market. The first and main obvious reasons for broker/dealers to operate in the OTC market is to generate revenue by capturing a fraction of bid/ask spread. In OTC markets, dealers are often referred to as liquidity providers since they offer a bid/ask quote for specific equity transactions; however, in an order-driven market, other type of investors (buy side, retail) are liquidity providers as well. As liquidity providers, broker/dealers provide investors a bid/ask quote which can be tighter to the one available on the lit side of the market since broker/dealers have large securities inventory and can rebalance their position in the mid to long run at their own risk. Due to the opaque nature of the OTC market, it is not possible to evaluate the revenues generated through the liquidity provision operations. However, to provide an order of magnitude, the size of that market for the equities that compose European major indices (FTSE, DAX, CAC 40, IBEX, SMI) is estimated at €15.8 billion for the year 2009.

Obviously liquidity providers have to be compensated for the cost incurred for providing liquidity. Serving investors' order flow generally leaves dealers holding inventory positions that are not optimal in terms of risk diversification. In addition, dealers need to be compensated for the possibility that some better informed traders might be able to leverage their superior information regarding the security value to trade against them. Therefore, it is clear that broker/dealers would never be able to capture the full potential of spread value, because they are not always on the winning side, and also they tend to provide a tighter spread than the one available on the lit markets.

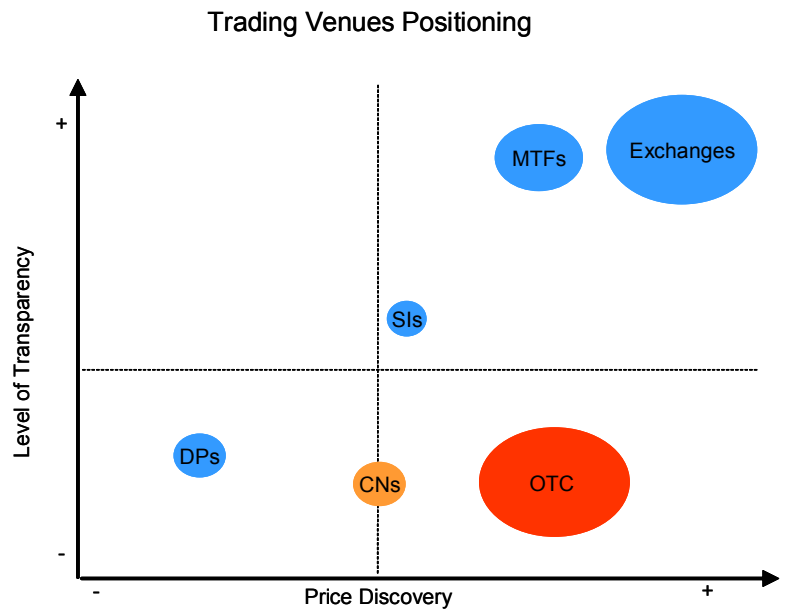
BDCNs could be good tools to capture information. Usually, dealers are at a loss when trading with better informed counterparts but recover this cost when trading against less informed counterparts, and hence the desire to capture this crucial information. The presence of informed traders is often revealed to liquidity providers through an order flow imbalance. Dealers can then incorporate the information of order flow

imbalances by adjusting quotes accordingly. This is obviously even more efficient if the order flow imbalance can be identified within the BDCNs; thus the desire for broker/dealers to attract traditional buy side firms' flow to their matching system. During our interviews with European buy side firms, this concern about information leakage is often stated as a reason for not participating in BDCNs even when the network has implemented a Chinese wall between the prop desk activity and its crossing network operations.

OTC Market: Driving the Cash Equity Market to Be Quote-Driven?

OTC market activity poses a real challenge to efficient price discovery mechanism. In fact the BDCNs, and to a greater extent the OTC markets, pose a real challenge to the MiFID spirit of promoting transparency. One can deduce that the design within MiFID of the reference price waivers for MTFs' dark pools was driven by the objective to concentrate most of the price discovery mechanism on the lit side of the market. While today, the price discovery mechanism mainly occurs on the incumbent regulated markets, and to a certain extent on the MTFs—as the LSE outage of November 2009 has demonstrated—it could eventually move toward the OTC market (see Figure 22). When about 44% of trading volume is executed outside the lit market (of which 38% is OTC and 6% is on RMs and MTFs under the waiver regime), one can actually question the validity of the price information provided by the lit side of the market. Obviously pre-trade transparency is not the only component of the price discovery mechanism; post-trade transparency is important as well. However, in an order driven market, pre-trade data is more important to price discovery than post-trade information, a situation that is totally reversed in the case of inventory (quote) driven market.

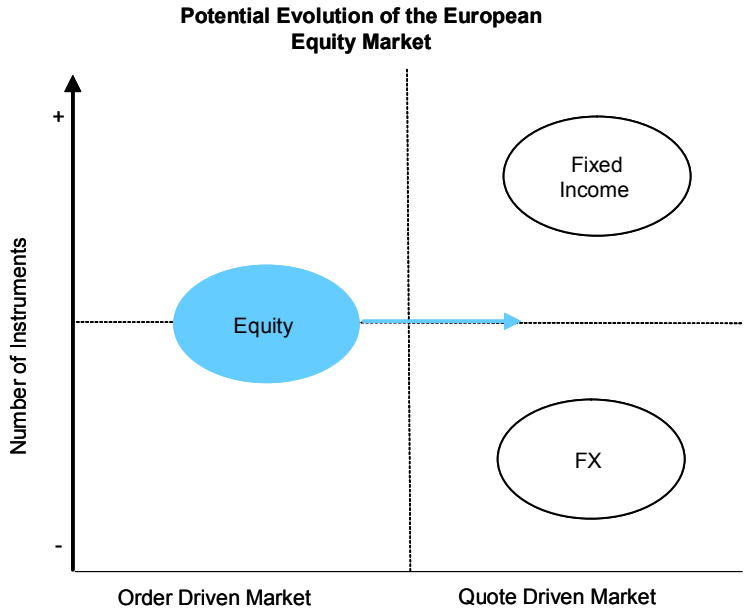
Figure 22: Positioning of European Trading Venues Categories



Source: Chair of e-Finance, Goethe University, Celent

If OTC and BDCNs continue to increase their market share, the European equity market could shift from an order-driven market to a quote-driven one. Registered dark pools are fully dependent on lit markets to provide the reference price needed to conduct transactions at midpoint. As long as this situation prevails, there is an equilibrium between volume executed on the lit markets and volume conducted on dark pools. Without a reliable price discovery mechanism happening on the lit regulated markets and the MTFs, the dark pools would cease functioning. However, the BDCNs operated by dealers pose a very different challenge since they are an electronification of OTC transactions in which price discovery and negotiations do happen. Therefore, since these BDCNs are less subordinate to lit market activity than the dark pools, the equilibrium between the volume conducted on the BDCNs and the one executed on the lit market would not be necessary. While this view might look extreme, one has to remember that in the vast majority of asset classes, OTC market is the dominant way of executing transactions. If the trading volume executed on the OTC market continues to increase, we could see the European equity market becoming more aligned with the fixed income and FX ones (see Figure 23) that are functioning quote-driven markets, but with very limited retail direct participation and a high level of concentration, with the vast majority of transactions being handled by a limited number of sell side institutions.

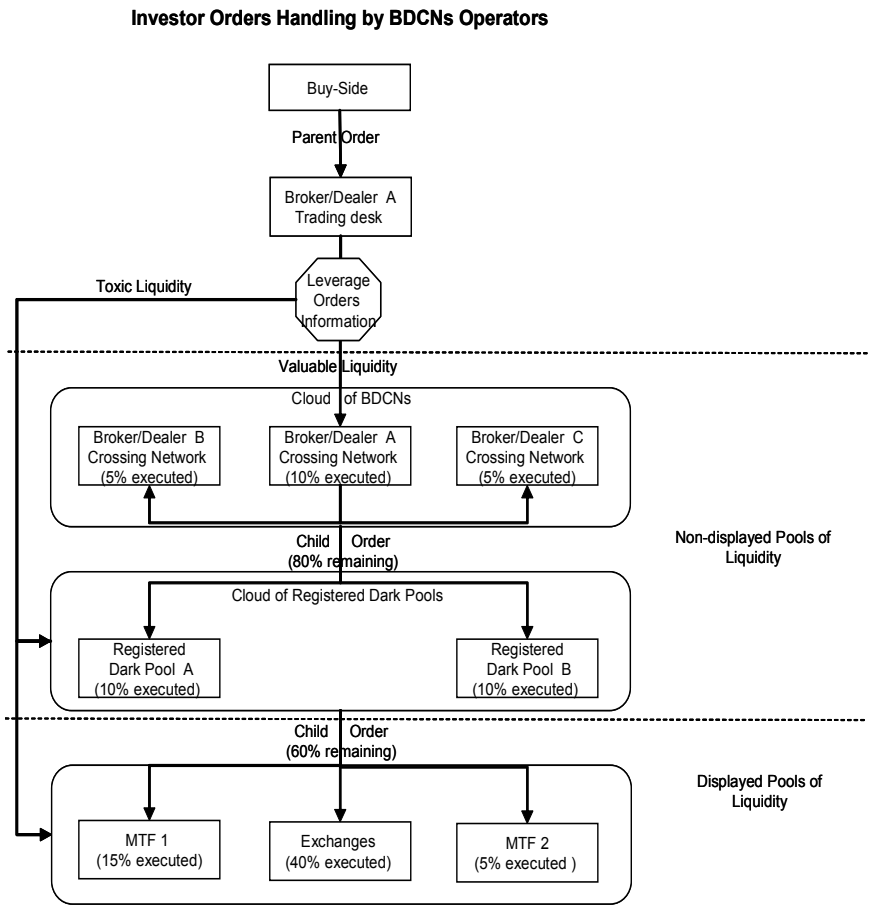
Figure 23: Market Model of the Three Main Vanilla Cash Asset Classes



Source: Chair of e-Finance, Goethe University, Celent

Order routing technology will reinforce the capture of order flow by BDCNs. Previously, one of the main limitations to BDCN order flow capture was the limited liquidity available in these pools. Recently, broker/dealers have announced the development of algo solutions to tie together their various crossing networks and therefore increase the likelihood of execution of orders. By doing so, broker/dealers will be able to capture more share of the volume executed in the European equity market and leverage the order flow information before they reach the regulated dark pools MTFs and/or lit side of the market (see Figure 24). Therefore it is realistic to think that instead of remaining stable or even decreasing, the OTC/BDCNs share of the European equity trading volume will increase in the future.

Figure 24: Investor Order Handling by BDCN Operators

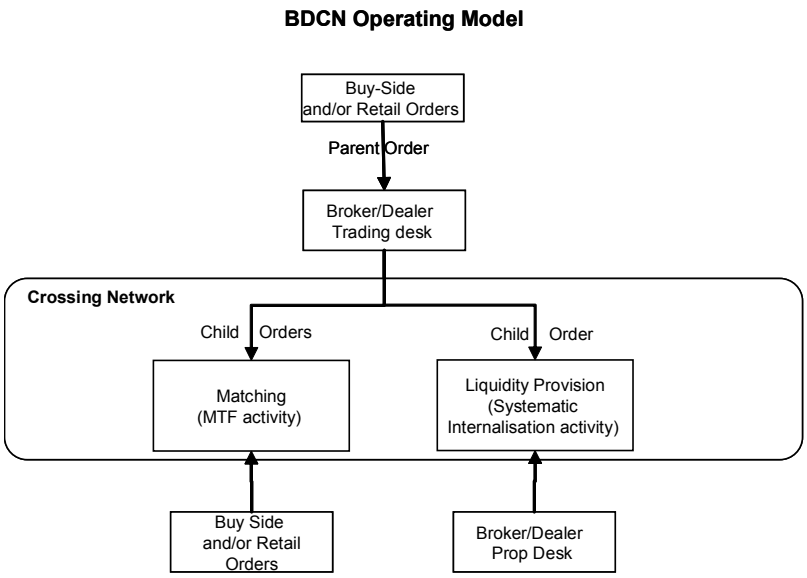


Source: Chair of e-Finance, Goethe University, Celent

BDCNs: Operating in a Regulatory Loophole

As often stated by broker/dealers, BDCNs are an electronification of their OTC activity. The benefits of bringing the OTC market towards electronic trading are numerous: trade capture is simpler and can be automated; trade affirmation and confirmation are easier; and regulatory reporting requirements are easier to fulfill. Nevertheless, we should question why broker/dealers that are providing the same type of services as a systematic internaliser or dark pool MTF (see Figure 25) are not regulated as such.

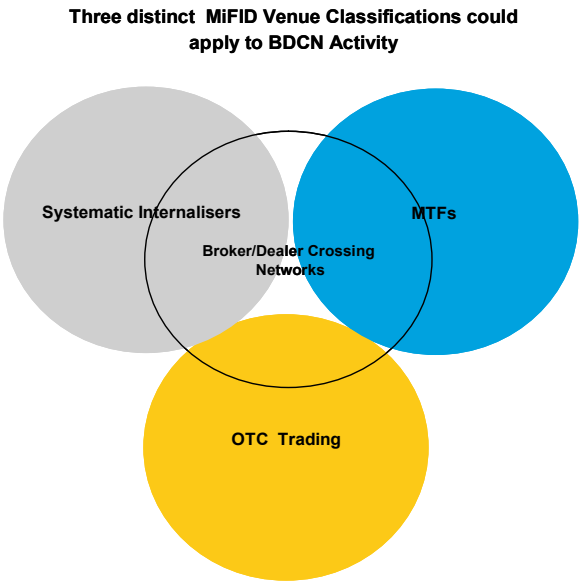
Figure 25: BDCN Operating Model



Source: Chair of e-Finance, Goethe University, Celent

Actually, the activities of the majority of European BDCNs would fit under three distinct trading classifications under MiFID: systematic internalisers, MTFs with or without transparency waivers, and OTC transactions (see Figure 26).

Figure 26: BDCN Venue Classification

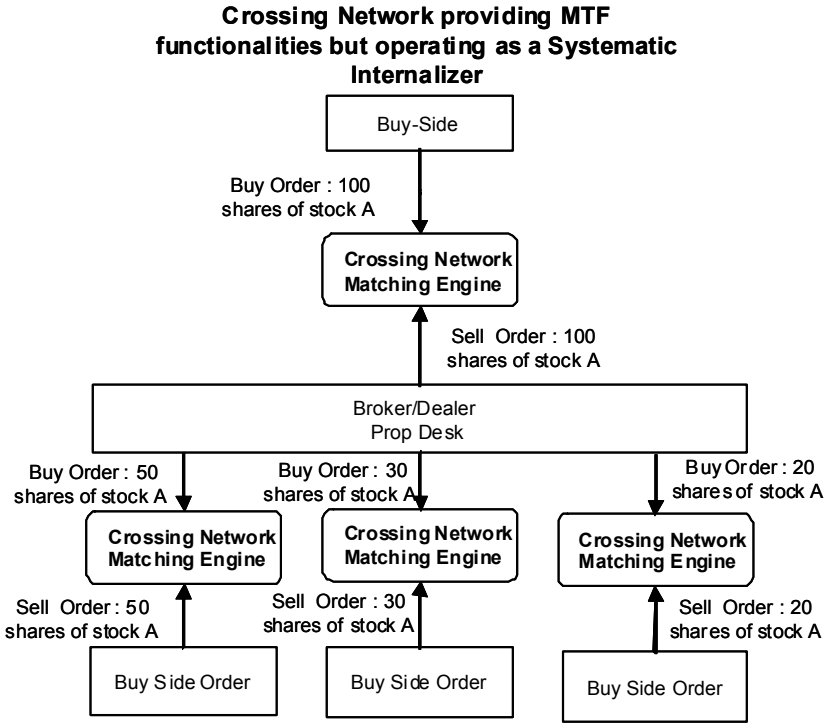


Source: Chair of e-Finance, Goethe University, Celent

Decreasing the level of uncertainty and complexity toward buy side clients. By segmenting their BDCN activity into SIs and MTFs, BDCNs will respond to some acute concerns of the buy side about potential conflicts of interest. BDCNs should go further in their client centricity by allowing buy side clients to choose if they wish their orders to be routed to the SI segment or to the MTF execution model of the BDCN trading platform, or to both or neither. In addition, by registering their BDCN either as MTF or SI, broker/dealers will decrease the level of complexity of the execution infrastructure that currently exists in the European equity market and facilitate the understanding of BDCN value proposition by buy side firms. Already one operator, Nomura, has addressed that issue by registering its BDCN as an MTF.

The multiform capabilities of a BDCN should not be underestimated. One could argue that a significant portion of the transactions conducted on a BDCN are in fact bilateral transactions and should therefore be considered SI activities by the regulators. We estimate that bilateral nature of a transaction is not a relevant criterion. While in principle it is a good distinction, in the case of a crossing network it is very tricky to implement because it is easy for BDCNs to turn MTF activity into bilateral transactions (see Figure 27).

Figure 27: Adaptability of BDCN Operating Model



Source: Chair of e-Finance, Goethe University, Celent

In this situation, the prop desk of the broker/dealer acts as the principal to every transaction even if he owns the security for a limited period of time. Obviously this generates some risk, but managing this risk and generating revenue through the spread is exactly the role dealers have performed in the OTC markets for decades.

The drawbacks of a possible threshold to the BDCN activity should be considered cautiously by the regulator. Such an approach to supervise BDCN activity is likely to create regulatory arbitrage opportunities for BDCN operators and to apply different rules to entities doing similar or identical things (BDCNs below a threshold vs. SIs or MTFs). This latter point is significant considering the totality of the regulatory framework that applies to an SI or MTF. As we mentioned earlier, with the implementation of sophisticated trading technology, an order is often sliced into smaller child orders that could be executed in the various subsegments of the crossing network. It is very likely that based on the threshold a BDCN operator, who often provides the algo and SORs to buy side customers, would avoid executing a transaction through a means that would make him fall under the Caudine forks of the regulator. Another strategy to circumvent the threshold issues could be for crossing network operators to split the crossing network into smaller sub-BDCNs (e.g., country-specific networks).

Implementing a threshold to BDCN volume will increase broker/dealer compliance cost. While some market participants are in favor of the implementation of a threshold under which a BDCN would not have to comply with the MiFID venue classification and requirements, one can question the economic value of implementing such a model to the BDCNs. The compliance requirements that the implementation of the threshold will drive are likely to increase the operating cost of the BDCNs because they will have to provide increased reporting data, be able to change the business model when thresholds are surpassed to comply with MiFID compliance requirements, etc. The regulatory and business model uncertainties coupled with the threshold monitoring activity are very likely to be more harmful to the BDCN operating model and profitability than pure compliance with MiFID venue classification requirements.

Access to Execution Venues

MiFID imposes certain rules on access to RMs, MTFs, and SIs based on the assumption that operating a liquidity pool triggers obligations to the rest of the marketplace, and therefore these operators need to accept certain obligations in terms of whom to accept and reject as a client. By contrast, OTC venue operators (BDCNs and other OTC) do not have to comply with such rules. The current market structure, with 40% of the market operating without any trading venue rules for access to the platform, has a significant impact on the various categories of investors in terms of access to execution venues and fair treatment.

- **Hedge funds (HFs) and proprietary traders (part of sell side):** Hedge funds and the sell side have the resources and access to the latest technology that allows them to engage in high frequency and algorithmic trading. Fragmentation of the equity markets is not a big hindrance for them

because they use smart order routers (SORs) to overcome the issue. They also have access to most of the new trading venues, such as MTFs, dark pools, and crossing networks. Many of these venues have in fact been started by the sell side. Hence, this category of traders is the best placed to take advantage of the fragmented, technology-driven post-MiFID marketplace, although at substantial cost.

- **Institutional buy side (non HFs):** While the hedge funds have been able to take advantage of the greater dependence on technology such as algorithmic trading and SORs, other buy side such as mutual funds, pension funds, etc., some of which have long-term trading horizons, do not employ tech-intensive trading to the same degree. These buy side firms have begun to rely more and more on technology, but in Europe they have not yet embraced it at a meaningful level. As a result, they are not able to compete on an even keel with the sell side and HFs. If required, these buy side firms can also enjoy the same access to trading venues as some of the sell side competitors, at comparative cost. An example of this technological disadvantage is that buy side firms in Europe that use direct market access have 30–40%[1] lower costs of trading[2] than firms that do not have DMA.
- **Retail buy side:** The retail investors do not have direct access to many of the new trading venues founded since MiFID. In addition, retail active traders are now becoming very confused about the fragmentation of the liquidity and their inability to understand and predict market behavior due to the lack of available pre- and post-trade data. The current trend is very likely to push the active retail investor segment to migrate to other asset classes.

Looking at the impact of different kinds of trading venues, we first look at dark pools. These are meant to facilitate block trading and reduce the market impact of large trades. However, dark pools encourage trading away from the public purview and reduce transparency in the market. Some of them have restricted access and are not available to the retail market. This is an example of asymmetric information and leads to suboptimal decision-making by retail investors. Regulators need to find a way to ensure that while the sell side/HFs are able to benefit from innovations such as dark pools, other buy side investors are not penalized unnecessarily.

Crossing networks are another innovation that has led to fragmentation in the markets. Unlike RMs or MTFs, which have to provide open and non-discriminatory access, these venues are limited to the existing members of the networks and customers of the broker/dealers, which indirectly penalizes the buy side firms that are not customers of the BDCN operator. While the restriction of BDCN access to customers is most relevant from a BDCN operator point of view (it is an added service provided to customers

1. This estimate is based on a survey conducted by Celent in December 2009 and January 2010 across European buy side.
2. Cost of trading includes not only direct execution cost (e.g., execution fees, market impact, access to venues, brokerage fees, etc.) but also post-trade cost (clearing & settlement cost, collateral in various CCPs, custodian fees, etc)).

and therefore a competitive differentiator), it is nonetheless in contrast to the MiFID intent of promoting fair accessibility in the European cash equity market. Under MiFID, the operator of a regulated market or an MTF should enable fair and egalitarian access to every investor class. The SIs also have to enable access on a nondiscriminatory basis (either retail or professional) per Art. 27 (5) of MiFID. This approach was taken by the regulator to ensure that each liquidity pool is accessible by every institution that falls under the specific market participant's category that is eligible to trade on the venue.

Surveillance

The emergence of multiple trading venues in the cash equity market can make some market manipulation tactics much more efficient and difficult to detect, especially when market surveillance activities are not centralized but conducted at a national and trading venue level. The case in the European cash equity market is even more difficult, with the lack of clarity in terms of the relative obligations of the supervisors vs. trading venue operators, the difficulty of conducting pan-European surveillance in a fragmented venue environment, the heterogeneity of regulatory regimes applying to the various trading venues from MiFID for regulated markets, MTFs, and SI to investment firms regulation for crossing networks and OTC markets (the latter two not obliged to conduct any surveillance but being subject to general market abuse rules). The three main types of market manipulation are detailed in the Appendix.

Venue Surveillance

While every category of market participant is bound by the Market Abuse Directive and is regulated, the situation is very different when it comes to the venue surveillance obligation:

- Regulated market: Surveillance duties under MiFID (Art 40(3) and Art 43) require the RM to monitor and enforce compliance of issuers and intermediaries with MAD, as well as ad hoc and continuous disclosure. Surveillance duties also imposed only on market operators directly under MAD (Recital 27 and Art 6(6)) require structural provisions aimed at preventing and detecting market abuse.
- MTFs: Surveillance duties under MiFID (Art 26) irrespective of operator—however, in practice, pan-European MTFs have not been expected by some supervisors to provide this role unless the venue has significant volume. There are no direct venue surveillance duties under MAD if the MTF is operated by a broker/dealer.
- OTC: Intermediary is subject to MAD like other intermediaries in its dealings with its clients, including reporting of suspicious transactions and prohibition of insider trading and market manipulation. However, no market surveillance duties similar to those of RMs or MTFs under either MiFID or MAD are imposed to OTC and BDCN transactions since they are not classified as venues. The fact that 40% of the transactions volume

occurring in the OTC space is not monitored for market abuse the same way that RMs or MTFs are generates some serious concerns about the overall quality of the monitoring of the European cash equity market activities.

To summarize, in today's European cash equity market, the bulk of the market surveillance activity and cost is handled by RMs and leading MTFs. The current non-classification as trading venues of BDCNs is clearly an advantage because it allows broker/dealers to save the cost incurred by venue surveillance requirements.

Market Surveillance

Monitoring the market to look for instances of market manipulation can be divided into three broad categories:

- Pre-emptive detection
- Real time specific detection
- General detection

Pre-emptive detection is the real time monitoring of the markets to prevent the market manipulation from happening in the first place. Since the aim is not to let the market manipulation happen, the automated systems look at order books and pre-trade data rather than post-trade data. Best examples are wash trades, improper matched orders, and marking the close, which can be prevented from happening if the orders are properly investigated. Also, for real time detection to happen, the automated systems have to actively search for a specific type of market manipulation (e.g., there has to be software which is specifically looking for wash trades and software which is specifically looking for improper matched orders).

Real-time specific detection. Some types of market manipulation cannot be detected and prevented pre-emptively. These types (e.g., painting the tape) can only be detected when the manipulation is happening or just after it has happened, especially by following trends in real time. Well-designed automated systems looking for a specific type of market manipulation can detect such manipulation in real time after a minimum of such trades have already happened (e.g., an automated system designed to check the presence of a squeeze will be able to do so when there have been at least some trades which display anti-competitive behavior). Such systems will look at pre-trade data as well as trends in post-trade data.

Post-trade general detection is the last line of defense. Some types of manipulation are difficult to check at all in real time. General detection systems look at anomalies in post-trade data; hence the need to improve the quality of post-trade data notably originated from the OTC side of the market, and these need to be investigated further (often manually) to ascertain whether some market manipulation has taken place. Examples include pump-and-dump, trash-and-crash, and insider trading.The common anomalies to look for in post-trade data are:

- The extent to which orders given or transactions undertaken represent a significant proportion of the daily volume of transactions in the financial instrument and especially when these activities lead to a significant change in the price of the financial instruments.
- The extent to which orders given or transactions undertaken by persons with a significant buying or selling position in a financial instrument lead to significant changes in the price of the financial instrument or related derivative or underlying asset admitted.
- The extent to which orders given or transactions undertaken include position reversals in a short period and represent a significant proportion of the daily volume of transactions in the relevant financial instrument and might be associated with significant changes in the price of the financial instrument.
- The extent to which orders given or transactions undertaken are concentrated within a short time span in the trading session and lead to a price change which is subsequently reversed.
- The extent to which orders given change the representation of the best bid or offer prices or change the representation of the order book and are removed before they are executed.

Conclusion

MiFID's key objectives are market efficiency, market integrity, and fairness. The key idea of MiFID is to establish a comprehensive regulatory regime governing trading in financial instruments irrespective of the trading methods used to conclude those transactions. Recognizing innovations in financial products, services, and specifically new trading methods and new trading technologies alongside regulated markets in the 15 years since the implementation of the original ISD, the Directive's aim was to establish a regime that assures the integrity and efficiency of the financial system in general, and high execution quality of investors' transactions and the transparency and efficiency of the price discovery process in particular. By defining a new trading venue classification (i.e., regulated markets, multilateral trading facilities, and systematic internalisers) and by enabling these venues to compete on a level playing field in terms of fees, services, and technology, the Directive tries to encourage innovation, reduce explicit and implicit trading costs for investors, and reduce the cost of capital for issuers.

However in practice, the OTC side of the market has not been touched by the MiFID regulation. Now three years after the implementation of MiFID, the reality of European markets reveals that the competition between regulated markets and the newly emerged MTFs works in favor of investors and has led to the desired effects in terms of technology and trading model innovations, service competition, significant fee reductions, and improved market quality in terms of reduced spreads and deeper order books. However, there are only a few investment firms that are registered as systematic internalisers, and transactions carried out on an OTC basis represent a significant (around 40%) and stable part of the overall trading volume in the European equity market. These facts raise some important questions.

In reality, trading activity currently reported as OTC activity is very different from the original MiFID intention. MiFID characterizes OTC transactions in Recital 53 as transactions that cumulatively fulfill the requirements of being ad hoc and irregular, carried out with wholesale counterparties, above standard market size, and conducted outside systems used for systematic internalization. The analysis of OTC data in this study reveals that currently the majority of OTC transactions are not larger but smaller than standard market size. If—as most market participants state—the minimization of market impact is the central motivation for OTC trading, one should expect that most OTC trades would face market impact if concluded on the reference market. However, the analysis reveals that most OTC trades would face no market impact. The share of OTC trades that would face no market impact increased from 68% in 2008 to 80% in 2010 for high liquids and from 58% in 2008 to 66% in 2010 for less liquids. A

significant share of OTC trades are rather small and would not face market impact, and the structural differences between OTC trading and primary market trades are overestimated in the public discussion.

Implementation of trading technologies has reinforced the sensitivity of market data. The fragmentation of venues driven by the opening of venue competition due to MiFID has accelerated the adoption of trading technology from order management systems to algos and SORS. This technologies have changed the way trading is conducted in the European cash equity market. Not only has it driven a decrease of order sizes but it has also made market data, pre- and post-trade, more crucial to market participants, because this information is necessary for this computer-based trading to operate. Therefore, investors are in a situation where they need to capture relevant market data as close to real time as possible, but, at the same time, are looking for opportunities to hide their own trading strategy and pattern. This concern about information leakage is driving an increase of order execution in the dark side of the market, be it through dark pools, crossing networks, or OTC. However, due to technology implementation cost and complex post-trade infrastructure, the vast majority of buy side volume (88%) is in fact handled by broker/dealers that are de facto in a situation to favor their own dark venues, the crossing networks, or phone brokerage (OTC) at the expense of dark pools.

BDCN are a positive evolution of the OTC market, but a vast majority of their operations should be regulated. Broker/dealers have developed matching engines to electronify their OTC activities that were mostly conducted over the phone in the past. This is a clear improvement for the industry as whole since it will decrease the likelihood of mismanaged orders, improve the post-trade processing and reporting, etc. However, BDCNs do not provide a unique model of execution. In reality, BDCN operations could qualify for all three venue classifications created by MiFID. Therefore the fact that BDCNs are currently considered OTC transactions is, to a certain extent, a breach of competition since they provide mostly the same services as the regulated venues without the regulatory burden, be it pre-trade transparency or the implementation of "waivers" for dark pool operations.

Reliance on OTC market operations should be closely supervised. The current level of transactions that are conducted OTC pose a real threat to the order-driven model of the European cash equity market. The situation is even more acute with the development of BDCNs that could capture more market share from the regulated trading venues (regulated markets, MTFs, SI). With negotiation happening in the OTC space, the price discovery mechanism happening on the "lit" market could be severely impacted, pushing the equity market to become a quote-driven market very similar to the structure in place in commoditized OTC asset classes that are the fixed income and spot FX markets.

The development of BDCNs creates second class investors. While MiFID has imposed non-discretionary access rules to the various regulated venues, BDCNs are allowed to provide access to selected customers across the various market participant types (traditional buy side, other sell side, hedge funds, etc.). Therefore, access to this

liquidity pool is not set on a fair basis, and some market participants that can not afford or do not wish to become customers of the BDCNs are very likely to become second class investors unable to access the whole liquidity pool available in the market. This situation is even more acute today since numerous BDCNs are becoming linked to one another to create a cloud of crossing networks that will deepen their pool of liquidity and increase the likelihood of execution.

The significant level of OTC activity and the development of BDCNs create some serious market surveillance concerns. Broker/dealers are a very regulated community, and they have to conduct some significant customer activities and order surveillance operations. However, they do not conduct any venue surveillance activity, as regulated trading venues do, and since they do not provide any pre-trade transparency either, the opportunity for an investor to conduct market abuse and market manipulation activities across the various untransparent and unmonitored liquidity pools has increased significantly. This concern should not be minimized because the current fragmented nature of the European regulatory and surveillance infrastructure requires the commitment of every single trading venue operator to minimize opportunities of misconduct and maximize the likelihood of spotting market abuse activity.

The key MiFID principle of functional regulation should not be touched. Obviously OTC trades are different from what MiFID envisages them to be, and therefore (i) the extent and profile of OTC reality has to be reflected in depth in a potential MiFID amendment, and (ii) the intention to protect large orders against market impact has to be cross-checked against the reality of trading opportunities provided in public, transparent markets and has to be adequately reflected in new metrics and regulatory parameters. In this discussion, the regulatory handling of BDCNs is a central component. It is undisputed that these crossing networks provide value to customers, and that there is a demand for that service. However, because these execution mechanisms are providing both a multilateral matching of client orders against each other and deal on their own account by executing client orders, they should be classified either as MTFs or as SIs and should fulfill the same regulatory obligations like these MiFID trading venues in terms of transparency, access, and venue surveillance. Given that functional regulation is a key concept of MIFID, the regulatory classification of BDCNs should be based on a functional perspective only. The implementation of a threshold approach for BDCNs currently discussed in the context of the MiFID review would enable these execution venues to leverage their flexibility and adaptability for regulatory arbitrage and would put other MIFID trading venues (e.g., smaller MTFs) that have to fulfill the full range of requirements at a significant competitive disadvantage.

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Appendix

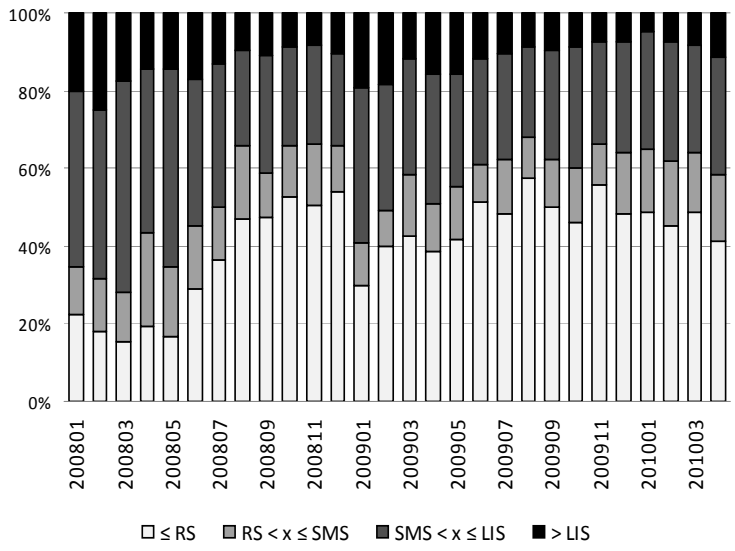
EURO STOXX 50 Instruments

Analysis of Transaction Sizes for BASF as an Example for Highly Liquid Shares

For BASF (ISIN: DE0005151005), the Thomson Reuters Tick History lists a total of 177,118 OTC trades between January, 1st 2008 and April, 30th 2010 with a total turnover of 144,739 EURm.

41.63% of all OTC trades in BASF are below or equal to the MIFID RS of 7,500 €, further 14.51% of all OTC trades are between the RS and the SMS (which is 15,000 € for BASF), i.e. in total 56.14% of all OTC trades in BASF are below or equal to the BASF SMS. 32.18% of all OTC trades are between SMS and LIS (which is 500,000 € for BASF) and 11.67% of all OTC trades are above LIS. Figure 28 shows how the split of OTC trades sizes into the various categories develops over time in the observation period. It shows that the share of OTC trades that are smaller than SMS increases from 50.48% (average for 2008) to 62.30% (average for 2010) while the share of OTC trades above LIS decreases from 13.58% (average for 2008) to 7.88% (average for 2010).

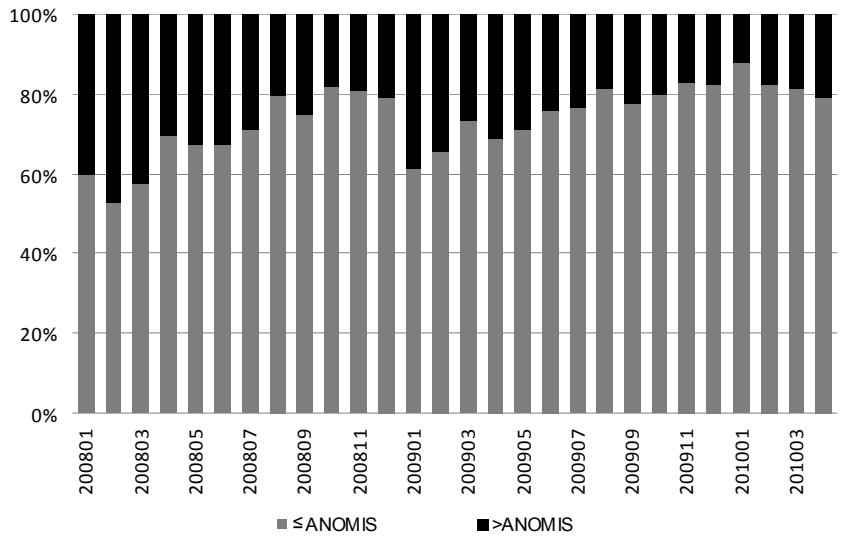
Figure 28: Development of OTC Trade Sizes for BASF in the Relevant Categories in the Observation Period



Source: Chair of e-Finance, Goethe University, Celent

ANOMIS is applied to identify the share of OTC trades that would face no market impact if concluded on the most relevant market in terms of liquidity (Xetra for BASF), i.e. leading to executions that would (on average) match no limits beyond the best bid or best offer in the order book. For BASF, in total 24.81% of all OTC trades show a size above ANOMIS, while 75.19% of all OTC trades would face no market impact on average. For BASF, the ANOMIS is 56,189 €. Figure 29 on page 68 shows how the split of OTC trade sizes into the trades above and below ANOMIS develops over time in the observation period. It shows that the share of OTC trades below ANOMIS, i.e., that would face no market impact, constantly increases from 71.20% (average for 2008) to 82.93% (average for 2010).

Figure 29: Development of OTC trade sizes above and below ANOMIS in the observation period for BASF



Source: Chair of e-Finance, Goethe University, Celent

Figure 3 on page 69 summarizes the BASF data described above for BASF OTC trading in 2008, 2009, the first four month in 2010 and the complete observation period from January, 2008 through April, 2010 ("Total"). Further it enables for the comparison of the OTC trades in BASF to the trades on the most relevant market in terms of liquidity (Xetra for BASF) which yields some obvious structural similarities (see Appendix EURO STOXX 50 instruments for the data on the other individual EURO STOXX 50 constituents).

Table 3: Data on BASF OTC and Xetra trades for 2008, 2009, 01 -04/2010 and for the complete observation period

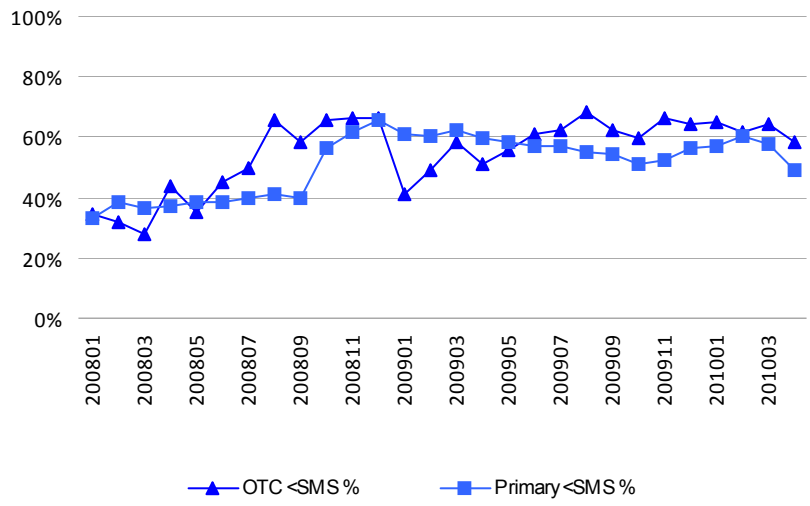
Name/Venue	Year	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
BASF SE OTC	2008	DE0005151005	75839	74,365.75	980,573.97	35.15%	15.33%	35.94%	13.58%	71.20%	28.80%
BASF SE Xetra	2008	DE0005151005	1903705	68,373.87	35,916.21	26.08%	19.36%	54.45%	0.11%	86.94%	13.06%
BASF SE OTC	2009	DE0005151005	67159	39,163.35	583,143.75	46.75%	12.67%	29.14%	11.44%	75.77%	24.23%
BASF SE Xetra	2009	DE0005151005	1477896	38,669.17	26,165.01	33.14%	23.96%	42.85%	0.06%	92.90%	7.10%
BASF SE OTC	2010	DE0005151005	34120	31,210.49	914,727.26	45.97%	16.34%	29.82%	7.88%	82.93%	17.07%
BASF SE Xetra	2010	DE0005151005	615902	17,372.92	28,207.27	28.97%	26.81%	44.16%	0.07%	92.19%	7.81%
BASF SE OTC	Total	DE0005151005	177118	144,739.59	817,193.03	41.63%	14.51%	32.18%	11.67%	75.19%	24.81%
BASF SE Xetra	Total	DE0005151005	3997503	124,415.96	31,123.42	29.14%	22.20%	48.57%	0.09%	89.95%	10.05%

Source: Chair of e-Finance, Goethe University, Celent

On Xetra, the most relevant market in terms of liquidity for BASF, a total of 3,997,503 trades with a total turnover of 124,415 EURm between January, 1st 2008 and April, 30th 2010 were observed. Due to some OTC trades at significant volumes, the share of OTC number of trades to total number of trades (OTC plus primary markets (Xetra)) is 4.2% (while the OTC share in terms of total turnover is 54%) and the average turnover in OTC trading with 817,193.03 € is significantly higher than on Xetra with 31,123.42 €. The share of OTC trades above LIS (11.67%) is obviously higher than the share of Xetra trades above LIS (0.09%). However, the median turnover (the 50th percentile), i.e., the turnover value in € below which 50% of the observations can be found is 11,041.24 € in the OTC market and 14,425.00 € on Xetra.

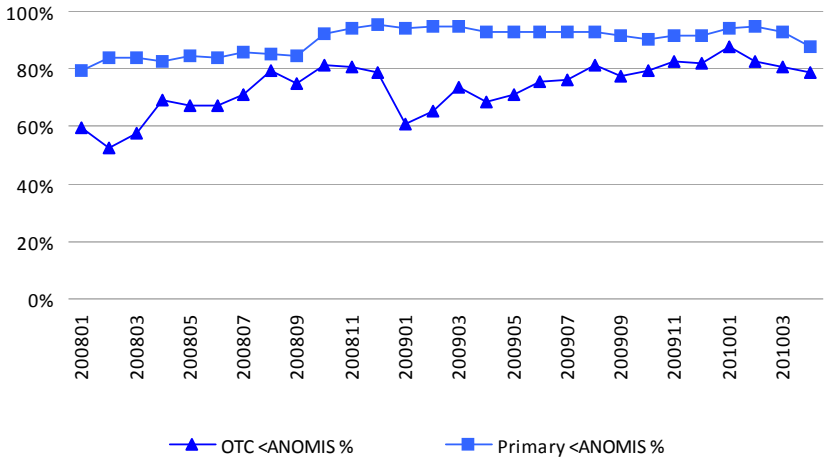
The share of trades below SMS (56.14% OTC and 51.34% on Xetra) and below ANOMIS (75.19% OTC and 89.95% on Xetra) shows a similar structure between OTC and primary market trading. Figure 30 on page 70 for trades relative to SMS and Figure 31 on page 70 for trades relative to ANOMIS reveal that this observation is consistent across the observation period.

Figure 30: Comparison of Primary Market (Xetra) and OTC trade Sizes Below SMS in the Observation Period for BASF



Source: Chair of e-Finance, Goethe University, Celent

Figure 31: Comparison of Primary Market (Xetra) and OTC Trade Sizes Below ANOMIS in the Observation Period for BASF



Source: Chair of e-Finance, Goethe University, Celent

Table 4: Analysis of Transaction Size for the Individual Constituents of the EURO STOXX 50 index

			2008							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
AB INBEV OTC	BE0003793107									
AB INBEV EN Brussels	BE0003793107									
DEUTSCHE BANK N OTC	DE0005140008	115957	178,877.76	1,542,621.49	40.25%	14.25%	31.59%	13.91%	68.35%	31.65%
DEUTSCHE BANK N Xetra	DE0005140008	3740419	128,312.88	34,304.41	30.17%	19.15%	50.50%	0.18%	76.48%	23.52%
BASF SE OTC	DE0005151005	75839	74,365.75	980,573.97	35.15%	15.33%	35.94%	13.58%	71.20%	28.80%
BASF SE Xetra	DE0005151005	1903705	68,373.87	35,916.21	26.08%	19.36%	54.45%	0.11%	86.94%	13.06%
DT TELEKOM N OTC	DE0005557508	84322	205,028.03	2,431,489.13	32.98%	13.64%	36.55%	16.83%	76.82%	23.18%
DT TELEKOM N Xetra	DE0005557508	1693222	97,198.52	57,404.48	27.21%	14.23%	57.65%	0.91%	94.86%	5.14%
DT BOERSE N OTC	DE0005810055	62499	43,241.43	691,874.02	31.37%	0.00%	56.04%	12.58%	63.95%	36.05%
DT BOERSE N Xetra	DE0005810055	1672590	51,778.99	30,957.37	25.62%	0.00%	74.28%	0.10%	73.32%	26.68%
RWE AG OTC	DE0007037129	64636	80,906.49	1,251,724.96	27.33%	16.50%	39.91%	16.27%	64.02%	35.98%
RWE AG Xetra	DE0007037129	2131873	79,784.19	37,424.46	24.77%	18.28%	56.83%	0.11%	80.80%	19.20%
DAIMLER AG N OTC	DE0007100000	99722	130,336.40	1,306,997.41	37.40%	0.00%	48.64%	13.95%	65.85%	34.15%
DAIMLER AG N Xetra	DE0007100000	2878031	112,674.15	39,149.74	27.14%	0.00%	72.68%	0.18%	73.29%	26.71%
SAP AG OTC	DE0007164600	67134	63,827.59	950,749.15	30.87%	14.22%	38.69%	16.22%	65.12%	34.88%
SAP AG Xetra	DE0007164600	1982482	73,957.48	37,305.50	24.97%	18.02%	56.87%	0.14%	81.01%	18.99%
SIEMENS N OTC	DE0007236101	102052	164,805.16	1,614,913.62	31.64%	14.08%	39.24%	15.03%	67.57%	32.43%
SIEMENS N Xetra	DE0007236101	3177141	130,308.77	41,014.47	23.78%	18.29%	57.78%	0.15%	81.07%	18.93%
ALLIANZ SE OTC	DE0008404005	103808	166,918.28	1,607,952.01	34.02%	12.65%	38.30%	15.03%	65.57%	34.43%
ALLIANZ SE Xetra	DE0008404005	3464346	128,196.75	37,004.60	26.16%	19.69%	53.97%	0.18%	78.37%	21.63%
MUENCH. RUECK N OTC	DE0008430026	53478	81,443.85	1,522,941.23	25.97%	15.37%	41.00%	17.66%	56.87%	43.13%
MUENCH. RUECK N Xetra	DE0008430026	1838933	63,864.15	34,728.92	22.21%	23.95%	53.71%	0.13%	76.10%	23.90%
BAYER N AG OTC	DE000BAY0017	77637	82,324.96	1,060,383.02	31.48%	16.47%	37.65%	14.40%	71.49%	28.51%
BAYER N AG Xetra	DE000BAY0017	2068963	76,473.01	36,962.00	23.93%	17.85%	58.11%	0.11%	88.23%	11.77%
E.ON AG NA OTC	DE000ENAG999	40614	26,300.33	647,568.09	49.23%	10.61%	29.22%	10.94%	80.98%	19.02%
E.ON AG NA Xetra	DE000ENAG999	1229071	44,643.06	36,322.61	26.20%	21.10%	52.61%	0.09%	94.71%	5.29%
BBVA OTC	ES0113211835	50983	146,102.27	2,865,705.65	18.54%	22.18%	39.50%	19.79%	73.47%	26.53%
BBVA Bolsa de Madrid	ES0113211835	2534437	109,069.83	43,035.13	34.52%	27.55%	37.35%	0.58%	97.58%	2.42%
BANCO SANTANDER OTC	ES0113900J37	68534	218,414.58	3,186,952.24	20.39%	24.71%	34.85%	20.06%	80.68%	19.32%
BANCO SANTANDER Bolsa de Madrid	ES0113900J37	3784716	184,882.50	48,849.77	35.75%	32.26%	31.26%	0.74%	99.36%	0.64%
IBERDROLA OTC	ES0144580Y14	38552	63,247.03	1,640,564.25	20.87%	20.15%	39.63%	19.35%	77.53%	22.47%
IBERDROLA Bolsa de Madrid	ES0144580Y14	1994101	77,099.02	38,663.55	36.31%	30.56%	32.57%	0.56%	98.98%	1.02%
REPSOL YPF OTC	ES0173516115	44771	54,793.90	1,223,870.25	22.92%	14.91%	45.53%	16.65%	66.78%	33.22%
REPSOL YPF Bolsa de Madrid	ES0173516115	1961285	55,645.85	28,372.14	36.62%	20.62%	42.40%	0.36%	93.67%	6.33%
TELEFONICA OTC	ES0178430E18	86801	150,695.39	1,736,102.01	18.61%	31.14%	35.41%	14.84%	81.36%	18.64%
TELEFONICA Bolsa de Madrid	ES0178430E18	3083975	171,553.76	55,627.48	26.86%	38.56%	33.70%	0.88%	97.79%	2.21%
NOKIA OTC	FI0009000681	101594	213,509.97	2,101,600.15	35.51%	28.36%	23.96%	0.01%	83.63%	16.37%
NOKIA Helsinki SE	FI0009000681	3091040	130,287.45	42,150.04	27.56%	41.03%	30.94%	0.00%	98.03%	1.97%
CREDIT AGRICOLE OTC	FR0000045072	39150	22,448.82	573,405.44	27.76%	0.00%	55.04%	17.20%	55.67%	44.33%
CREDIT AGRICOLE EN Paris	FR0000045072	2636139	42,125.56	15,980.02	51.06%	0.00%	48.79%	0.15%	89.07%	10.93%
AIR LIQUIDE OTC	FR0000120073	39976	17,347.48	433,947.46	32.56%	0.00%	54.90%	12.54%	64.36%	35.64%
AIR LIQUIDE EN Paris	FR0000120073	2134803	29,801.83	13,959.99	49.96%	0.00%	49.93%	0.11%	90.52%	9.48%
CARREFOUR OTC	FR0000120172	39715	36,780.20	926,103.46	30.29%	0.00%	50.94%	18.77%	55.94%	44.06%
CARREFOUR EN Paris	FR0000120172	2296798	41,738.79	18,172.60	41.66%	0.00%	58.16%	0.18%	89.17%	10.83%
TOTAL OTC	FR0000120271	101008	142,867.54	1,414,418.04	29.13%	0.00%	56.32%	14.55%	67.23%	32.77%
TOTAL EN Paris	FR0000120271	4913347	137,054.81	27,894.39	30.87%	0.00%	68.82%	0.31%	87.65%	12.35%
L OREAL OTC	FR0000120321	38121	23,257.53	610,097.50	31.17%	0.00%	53.01%	15.82%	57.50%	42.50%
L OREAL EN Paris	FR0000120321	2042148	33,566.77	16,436.99	44.84%	0.00%	55.02%	0.14%	88.50%	11.50%

Source: Chair of e-Finance, Goethe University, Celent

			2008							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
SANOFI-AVENTIS OTC	FR0000120578	62688	74,788.42	1,193,026.09	29.79%	0.00%	54.67%	15.54%	63.52%	36.48%
SANOFI-AVENTIS EN Paris	FR0000120578	3059488	70,419.50	23,016.76	34.35%	0.00%	65.42%	0.24%	89.63%	10.37%
AXA OTC	FR0000120628	58697	54,053.24	920,885.83	29.18%	0.00%	53.11%	17.71%	58.25%	41.75%
AXA EN Paris	FR0000120628	3565090	77,643.77	21,778.91	37.00%	0.00%	62.78%	0.22%	87.39%	12.61%
DANONE OTC	FR0000120644	48560	25,671.77	528,660.73	29.25%	0.00%	55.39%	15.36%	60.97%	39.03%
DANONE EN Paris	FR0000120644	2372692	41,424.04	17,458.67	39.61%	0.00%	60.23%	0.16%	89.79%	10.21%
L.V.M.H. OTC	FR0000121014	35114	23,575.11	671,387.89	28.70%	0.00%	55.21%	16.09%	56.41%	43.59%
L.V.M.H. EN Paris	FR0000121014	2208285	33,490.02	15,165.62	48.81%	0.00%	51.07%	0.12%	90.63%	9.37%
SCHNEIDER ELECTR OTC	FR0000121972	43260	22,430.41	518,502.42	30.69%	0.00%	56.54%	12.77%	63.50%	36.50%
SCHNEIDER ELECTR EN Paris	FR0000121972	2103143	29,256.18	13,910.70	47.26%	0.00%	52.64%	0.10%	90.95%	9.05%
UNIBAIL RODAMCO OTC	FR0000124711	26997	32,788.28	1,214,515.81	27.51%	0.00%	57.84%	14.66%	62.09%	37.91%
UNIBAIL RODAMCO EN Paris	FR0000124711	1209140	21,021.33	17,385.36	40.77%	0.00%	59.12%	0.11%	94.33%	5.67%
SAINT-GOBAIN OTC	FR0000125007	31335	26,981.42	861,063.37	31.51%	0.00%	52.25%	16.23%	54.74%	45.26%
SAINT-GOBAIN EN Paris	FR0000125007	2220924	31,046.40	13,979.04	51.76%	0.00%	48.11%	0.12%	89.80%	10.20%
VINCI OTC	FR0000125486	32940	22,918.99	695,779.79	30.87%	17.94%	35.69%	15.51%	56.06%	43.94%
VINCI EN Paris	FR0000125486	2317664	30,621.75	13,212.33	54.48%	25.32%	20.07%	0.12%	90.31%	9.69%
VIVENDI OTC	FR0000127771	71658	45,045.52	628,618.11	34.51%	0.00%	54.22%	11.27%	73.41%	26.59%
VIVENDI EN Paris	FR0000127771	2625017	44,484.62	16,946.41	42.41%	0.00%	57.42%	0.16%	93.80%	6.20%
SOCIETE GENERALE OTC	FR0000130809	60241	135,631.42	2,251,480.21	29.80%	0.00%	53.79%	16.41%	60.04%	39.96%
SOCIETE GENERALE EN Paris	FR0000130809	4325259	103,908.96	24,023.75	39.02%	0.00%	60.70%	0.28%	82.22%	17.78%
BNP PARIBAS OTC	FR0000131104	80644	78,429.44	972,539.03	30.78%	0.00%	54.63%	14.59%	64.95%	35.05%
BNP PARIBAS EN Paris	FR0000131104	4804629	103,652.71	21,573.51	40.46%	0.00%	59.30%	0.24%	88.86%	11.14%
FRANCE TELECOM OTC	FR0000133308	85148	81,746.76	960,054.99	32.16%	0.00%	53.69%	14.14%	72.94%	27.06%
FRANCE TELECOM EN Paris	FR0000133308	3449199	82,468.04	23,909.33	35.79%	0.00%	63.95%	0.26%	94.22%	5.78%
GDF SUEZ OTC	FR0010208488	27631	22,951.56	830,645.34	35.71%	0.00%	50.77%	13.52%	64.75%	35.25%
GDF SUEZ EN Paris	FR0010208488	1810088	27,904.68	15,416.20	51.86%	0.00%	47.96%	0.18%	93.01%	6.99%
ALSTOM OTC	FR0010220475	44050	17,532.24	398,007.64	35.92%	0.00%	52.74%	11.33%	65.84%	34.16%
ALSTOM EN Paris	FR0010220475	2738556	32,594.36	11,902.03	57.56%	0.00%	42.37%	0.07%	90.20%	9.80%
CRH PLC OTC	IE0001827041	17623	4,855.22	275,504.81	31.15%	12.02%	42.54%	14.29%	51.01%	48.99%
CRH PLC Irland SE	IE0001827041	101403	10,011.48	98,729.62	31.74%	15.23%	49.06%	3.97%	59.08%	40.92%
GENERALI ASS OTC	IT0000062072	24096	54,808.91	2,274,606.18	28.52%	13.28%	40.34%	17.86%	66.36%	33.64%
GENERALI ASS Borsa Italiana	IT0000062072	1969827	45,803.91	23,252.76	37.64%	22.46%	39.86%	0.04%	97.62%	2.38%
UNICREDIT OTC	IT0000064854	50760	86,536.96	1,704,825.78	34.71%	12.95%	36.70%	15.64%	86.85%	13.15%
UNICREDIT Borsa Italiana	IT0000064854	5264784	164,065.29	31,162.78	40.92%	16.50%	42.50%	0.09%	99.96%	0.04%
INTESA SANPAOLO OTC	IT0000072618	41299	77,270.36	1,870,998.28	31.23%	13.28%	39.96%	15.53%	78.32%	21.68%
INTESA SANPAOLO Borsa Italiana	IT0000072618	3031182	83,288.00	27,477.07	39.03%	19.49%	41.43%	0.05%	99.68%	0.32%
ENEL OTC	IT0003128367	35992	70,288.97	1,952,905.36	36.13%	12.80%	37.95%	13.12%	80.50%	19.50%
ENEL Borsa Italiana	IT0003128367	2593481	52,137.71	30,096.99	47.32%	16.42%	36.18%	0.07%	99.20%	0.80%
ENI OTC	IT0003132476	63041	126,058.99	1,999,635.08	29.47%	24.27%	31.63%	14.64%	83.84%	16.16%
ENI Borsa Italiana	IT0003132476	3923003	156,495.22	39,891.69	33.63%	36.03%	30.28%	0.06%	99.89%	0.11%
TELECOM ITALIA OTC	IT0003497168	25866	32,634.95	1,261,693.09	30.42%	0.00%	53.49%	16.09%	70.47%	29.53%
TELECOM ITALIA Borsa Italiana	IT0003497168	2465501	50,047.00	20,298.92	50.37%	0.00%	49.58%	0.06%	98.65%	1.35%
ARCELORMITTAL OTC	LU0323134006	55408	95,920.83	1,731,172.93	23.23%	12.16%	39.70%	24.92%	51.31%	48.69%
ARCELORMITTAL EN Amsterdam	LU0323134006	2229773	56,024.16	25,125.50	33.18%	21.44%	45.25%	0.13%	86.51%	13.49%
UNILEVER CERT OTC	NL0000009355	45197	148,143.16	3,277,721.07	26.12%	13.14%	43.02%	17.72%	61.61%	38.39%
UNILEVER CERT EN Amsterdam	NL0000009355	2628518	57,926.29	22,037.62	31.55%	25.72%	42.55%	0.18%	94.26%	5.74%
PHILIPS KON OTC	NL0000009538	36757	45,202.94	1,229,777.82	29.78%	11.11%	41.52%	17.58%	56.57%	43.43%
PHILIPS KON EN Amsterdam	NL0000009538	2289067	42,974.31	18,773.72	42.06%	24.39%	33.41%	0.15%	90.30%	9.70%
ING GROEP OTC	NL0000303600	58456	83,982.97	1,436,686.83	25.98%	12.86%	40.68%	20.48%	51.43%	48.57%
ING GROEP EN Amsterdam	NL0000303600	3640753	92,641.58	25,445.72	35.54%	21.13%	43.09%	0.24%	83.26%	16.74%
AEGON OTC	NL0000303709	31605	98,641.87	3,121,084.35	33.13%	0.00%	52.94%	13.93%	53.30%	46.70%
AEGON EN Amsterdam	NL0000303709	2028319	29,496.68	14,542.43	50.88%	0.00%	49.00%	0.12%	87.39%	12.61%
EuroStoxx50 OTC		2791966	3,976,731.46	1,424,348.10	30.75%	9.98%	43.83%	15.44%	67.74%	32.26%
EuroStoxx50 Primary Markets		129228350	3,639,239.98	28,161.31	37.06%	12.86%	49.85%	0.23%	89.99%	10.01%

Source: Chair of e-Finance, Goethe University, Celent

			2009							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
AB INBEV OTC	BE0003793107	53353	9,419.73	176,554.89	54.56%	0.00%	40.34%	5.11%	82.18%	66.92%
AB INBEV EN Brussels	BE0003793107	1040567	13,479.38	12,953.88	54.53%	0.00%	45.36%	0.12%	95.35%	0.00%
DEUTSCHE BANK N OTC	DE0005140008	98989	56,682.23	572,611.41	48.47%	13.42%	28.05%	10.06%	74.69%	25.31%
DEUTSCHE BANK N Xetra	DE0005140008	3459715	72,381.45	20,921.22	39.74%	24.22%	35.99%	0.05%	88.02%	11.98%
BASF SE OTC	DE0005151005	67159	39,163.35	583,143.75	46.75%	12.67%	29.14%	11.44%	75.77%	24.23%
BASF SE Xetra	DE0005151005	1477896	38,669.17	26,165.01	33.14%	23.96%	42.85%	0.06%	92.90%	7.10%
DT TELEKOM N OTC	DE0005557508	75133	67,597.29	899,701.67	45.26%	10.61%	29.09%	15.03%	78.18%	21.82%
DT TELEKOM N Xetra	DE0005557508	1276364	47,760.98	37,419.56	32.29%	19.29%	48.24%	0.18%	97.92%	2.08%
DT BOERSE N OTC	DE0005810055	55267	19,841.47	359,011.23	47.35%	0.00%	43.78%	8.87%	73.79%	26.21%
DT BOERSE N Xetra	DE0005810055	1120561	20,210.96	18,036.46	42.63%	0.00%	57.31%	0.06%	89.46%	10.54%
RWE AG OTC	DE0007037129	54534	44,092.23	808,527.40	43.53%	11.69%	29.98%	14.81%	69.06%	30.94%
RWE AG Xetra	DE0007037129	1456589	36,633.98	25,150.53	35.07%	23.77%	41.10%	0.06%	90.07%	9.93%
DAIMLER AG N OTC	DE0007100000	78123	48,667.34	622,957.90	46.69%	0.00%	40.55%	12.76%	71.94%	28.06%
DAIMLER AG N Xetra	DE0007100000	2387366	49,706.53	20,820.66	31.62%	0.00%	68.32%	0.06%	84.75%	15.25%
SAP AG OTC	DE0007164600	60847	41,891.13	688,466.60	44.98%	11.85%	29.50%	13.68%	71.44%	28.56%
SAP AG Xetra	DE0007164600	1524377	38,505.75	25,259.99	35.79%	24.69%	39.45%	0.07%	90.29%	9.71%
SIEMENS N OTC	DE0007236101	76178	86,379.40	1,133,915.34	41.47%	12.10%	31.67%	14.76%	70.54%	29.46%
SIEMENS N Xetra	DE0007236101	2171264	59,283.79	27,303.81	30.78%	24.31%	44.86%	0.06%	90.65%	9.35%
ALLIANZ SE OTC	DE0008404005	74199	53,971.49	727,388.35	46.72%	11.70%	28.97%	12.61%	71.41%	28.59%
ALLIANZ SE Xetra	DE0008404005	2260740	53,988.23	23,880.78	35.76%	23.90%	40.29%	0.05%	89.04%	10.96%
MUENCH. RUECK N OTC	DE0008430026	51515	37,539.57	728,711.37	42.25%	12.74%	31.79%	13.23%	68.02%	31.98%
MUENCH. RUECK N Xetra	DE0008430026	1353716	30,765.77	22,726.90	35.14%	27.19%	37.61%	0.06%	87.59%	12.41%
BAYER N AG OTC	DE000BAY0017	53843	42,722.31	793,460.81	42.95%	11.91%	31.33%	13.80%	73.31%	26.69%
BAYER N AG Xetra	DE000BAY0017	1571494	45,395.69	28,886.96	30.50%	23.15%	46.28%	0.07%	92.87%	7.13%
E.ON AG NA OTC	DE000ENAG999	49641	56,780.30	1,143,818.67	51.50%	9.69%	25.17%	13.64%	78.04%	21.96%
E.ON AG NA Xetra	DE000ENAG999	1734368	54,965.10	31,691.72	30.59%	22.13%	47.20%	0.07%	95.79%	4.21%
BBVA OTC	ES0113211835	31782	107,286.11	3,375,687.89	16.81%	16.86%	39.05%	27.28%	63.55%	36.45%
BBVA Bolsa de Madrid	ES0113211835	2470670	74,015.69	29,957.74	38.50%	30.06%	31.18%	0.26%	98.79%	1.21%
BANCO SANTANDER OTC	ES0113900J37	41776	166,993.07	3,997,344.59	18.46%	22.58%	31.67%	27.30%	73.64%	26.36%
BANCO SANTANDER Bolsa de Madrid	ES0113900J37	3763603	142,359.49	37,825.32	38.71%	33.71%	27.23%	0.35%	99.71%	0.29%
IBERDROLA OTC	ES0144580Y14	20518	46,510.45	2,266,811.91	16.47%	16.68%	38.45%	28.40%	67.46%	32.54%
IBERDROLA Bolsa de Madrid	ES0144580Y14	1741334	45,114.02	25,907.73	42.41%	30.07%	27.30%	0.22%	99.59%	0.41%
REPSOL YPF OTC	ES0173516115	20279	44,583.62	2,198,511.78	20.11%	12.07%	44.82%	22.99%	54.82%	45.18%
REPSOL YPF Bolsa de Madrid	ES0173516115	1489767	26,749.82	17,955.71	47.86%	21.71%	30.30%	0.14%	96.84%	3.16%
TELEFONICA OTC	ES0178430E18	46170	169,637.90	3,674,201.79	17.62%	24.09%	32.95%	25.34%	69.67%	30.33%
TELEFONICA Bolsa de Madrid	ES0178430E18	3031278	114,050.10	37,624.43	35.59%	37.44%	26.51%	0.46%	98.85%	1.15%
NOKIA OTC	FI0009000681	78209	37,757.18	482,772.79	49.15%	22.32%	17.83%	0.01%	85.39%	14.61%
NOKIA Helsinki SE	FI0009000681	2326445	54,472.93	23,414.66	41.69%	41.92%	16.19%	0.00%	99.27%	0.73%
CREDIT AGRICOLE OTC	FR0000045072	46530	13,261.47	285,009.09	50.86%	0.00%	39.49%	9.65%	71.52%	28.48%
CREDIT AGRICOLE EN Paris	FR0000045072	2167625	17,798.56	8,211.09	72.56%	0.00%	27.38%	0.05%	96.39%	3.61%
AIR LIQUIDE OTC	FR0000120073	38360	12,456.33	324,721.79	42.47%	0.00%	45.55%	11.98%	63.99%	36.01%
AIR LIQUIDE EN Paris	FR0000120073	1590387	16,776.38	10,548.61	63.71%	0.00%	36.22%	0.07%	94.00%	6.00%
CARREFOUR OTC	FR0000120172	59272	23,427.56	395,255.06	52.00%	0.00%	35.89%	12.11%	70.72%	29.28%
CARREFOUR EN Paris	FR0000120172	1954876	23,656.60	12,101.33	56.75%	0.00%	43.14%	0.11%	94.94%	5.06%
TOTAL OTC	FR0000120271	125985	156,965.87	1,245,909.17	45.70%	0.00%	42.51%	11.79%	75.21%	24.79%
TOTAL EN Paris	FR0000120271	4338942	80,028.11	18,444.15	43.66%	0.00%	56.15%	0.19%	95.48%	4.52%
L OREAL OTC	FR0000120321	48621	15,070.96	309,968.18	46.91%	0.00%	42.43%	10.67%	69.31%	30.69%
L OREAL EN Paris	FR0000120321	1423594	16,627.48	11,679.93	59.14%	0.00%	40.78%	0.08%	93.99%	6.01%

Source: Chair of e-Finance, Goethe University, Celent

			2009							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
SANOFI-AVENTIS OTC	FR0000120578	94132	54,439.54	578,331.96	47.70%	0.00%	41.31%	11.00%	75.31%	24.69%
SANOFI-AVENTIS EN Paris	FR0000120578	3060334	46,735.28	15,271.30	47.91%	0.00%	51.94%	0.15%	95.20%	4.80%
AXA OTC	FR0000120628	68742	29,504.61	429,207.92	50.34%	0.00%	38.73%	10.93%	72.36%	27.64%
AXA EN Paris	FR0000120628	3230728	35,648.92	11,034.33	63.42%	0.00%	36.48%	0.10%	96.06%	3.94%
DANONE OTC	FR0000120644	62559	24,618.95	393,531.73	45.10%	0.00%	43.11%	11.78%	69.69%	30.31%
DANONE EN Paris	FR0000120644	2395014	27,710.01	11,569.87	57.21%	0.00%	42.70%	0.09%	95.01%	4.99%
L.V.M.H. OTC	FR0000121014	49953	23,630.67	473,057.98	44.00%	0.00%	44.37%	11.63%	68.01%	31.99%
L.V.M.H. EN Paris	FR0000121014	1686172	20,936.24	12,416.43	55.72%	0.00%	44.20%	0.08%	94.32%	5.68%
SCHNEIDER ELECTR OTC	FR0000121972	51207	15,772.11	308,006.98	45.45%	0.00%	44.48%	10.07%	69.26%	30.74%
SCHNEIDER ELECTR EN Paris	FR0000121972	1781302	19,604.93	11,005.96	58.46%	0.00%	41.47%	0.07%	94.35%	5.65%
UNIBAIL RODAMCO OTC	FR0000124711	37586	11,766.98	313,068.04	42.41%	0.00%	48.47%	9.11%	71.90%	28.10%
UNIBAIL RODAMCO EN Paris	FR0000124711	968859	13,777.78	14,220.63	54.47%	0.00%	45.43%	0.10%	96.45%	3.55%
SAINT-GOBAIN OTC	FR0000125007	59035	13,399.15	226,969.67	52.23%	0.00%	39.26%	8.50%	73.14%	26.86%
SAINT-GOBAIN EN Paris	FR0000125007	2367489	22,743.12	9,606.43	64.34%	0.00%	35.60%	0.06%	94.91%	5.09%
VINCI OTC	FR0000125486	48071	18,793.66	390,956.36	47.96%	12.63%	27.98%	11.44%	67.21%	32.79%
VINCI EN Paris	FR0000125486	1998084	19,264.64	9,641.56	66.81%	21.12%	12.00%	0.06%	94.71%	5.29%
VIVENDI OTC	FR0000127771	86994	11,074.98	127,307.34	53.08%	0.00%	37.43%	9.49%	77.44%	22.56%
VIVENDI EN Paris	FR0000127771	2445998	30,335.94	12,402.28	54.90%	0.00%	45.01%	0.10%	96.57%	3.43%
SOCIETE GENERALE OTC	FR0000130809	64247	22,118.93	344,279.53	47.26%	0.00%	43.49%	9.25%	73.86%	26.14%
SOCIETE GENERALE EN Paris	FR0000130809	3195928	41,064.47	12,849.00	56.30%	0.00%	43.59%	0.11%	93.51%	6.49%
BNP PARIBAS OTC	FR0000131104	87595	41,714.95	476,225.29	47.12%	0.00%	42.03%	10.85%	73.25%	26.75%
BNP PARIBAS EN Paris	FR0000131104	4086169	56,369.04	13,795.08	56.00%	0.00%	43.86%	0.14%	94.72%	5.28%
FRANCE TELECOM OTC	FR0000133308	91982	56,940.10	619,035.23	46.91%	0.00%	40.99%	12.10%	76.41%	23.59%
FRANCE TELECOM EN Paris	FR0000133308	2875023	45,277.23	15,748.48	48.86%	0.00%	50.98%	0.16%	97.36%	2.64%
GDF SUEZ OTC	FR0010208488	107335	50,453.90	470,060.13	51.06%	0.00%	41.48%	7.47%	80.78%	19.22%
GDF SUEZ EN Paris	FR0010208488	2920659	35,565.73	12,177.30	57.65%	0.00%	42.23%	0.12%	95.62%	4.38%
ALSTOM OTC	FR0010220475	45152	11,180.31	247,615.03	48.18%	0.00%	42.12%	9.70%	68.65%	31.35%
ALSTOM EN Paris	FR0010220475	1984983	18,763.47	9,452.71	64.36%	0.00%	35.60%	0.04%	93.65%	6.35%
CRH PLC OTC	IE0001827041	32023	6,884.02	214,971.16	38.93%	14.16%	37.34%	9.58%	61.12%	38.88%
CRH PLC Irland SE	IE0001827041	140675	9,619.47	68,380.84	44.51%	18.42%	34.47%	2.59%	73.86%	26.14%
GENERALI ASS OTC	IT0000062072	20150	19,210.98	953,398.65	35.42%	11.32%	36.20%	17.06%	66.42%	33.58%
GENERALI ASS Borsa Italiana	IT0000062072	1794671	25,422.72	14,165.67	53.14%	24.77%	22.06%	0.03%	99.20%	0.80%
UNICREDIT OTC	IT0000064854	31708	36,546.11	1,152,583.10	38.47%	9.76%	35.10%	16.67%	86.17%	13.83%
UNICREDIT Borsa Italiana	IT0000064854	6451020	123,778.80	19,187.48	51.23%	19.47%	29.20%	0.11%	99.95%	0.05%
INTESA SANPAOLO OTC	IT0000072618	40960	23,682.53	578,186.78	44.36%	10.50%	32.91%	12.22%	82.08%	17.92%
INTESA SANPAOLO Borsa Italiana	IT0000072618	2779710	43,709.78	15,724.58	49.76%	23.61%	26.61%	0.03%	99.84%	0.16%
ENEL OTC	IT0003128367	40027	74,825.94	1,869,386.70	43.18%	12.44%	31.35%	13.03%	81.41%	18.59%
ENEL Borsa Italiana	IT0003128367	2724480	52,137.71	19,136.75	52.99%	22.78%	24.20%	0.03%	99.81%	0.19%
ENI OTC	IT0003132476	57435	67,673.06	1,178,254.71	41.41%	17.91%	26.87%	13.82%	84.70%	15.30%
ENI Borsa Italiana	IT0003132476	3514745	118,220.26	33,635.52	38.45%	37.29%	24.18%	0.09%	99.84%	0.16%
TELECOM ITALIA OTC	IT0003497168	32519	20,267.93	623,264.26	54.42%	0.00%	34.63%	10.95%	79.37%	20.63%
TELECOM ITALIA Borsa Italiana	IT0003497168	1678482	21,786.59	12,979.94	61.16%	0.00%	38.81%	0.03%	99.67%	0.33%
ARCELORMITTAL OTC	LU0323134006	100324	42,109.55	419,735.53	41.63%	18.15%	30.14%	10.08%	77.21%	22.79%
ARCELORMITTAL EN Amsterdam	LU0323134006	4791488	63,614.32	13,276.53	49.57%	27.53%	22.83%	0.06%	96.17%	3.83%
UNILEVER CERT OTC	NL0000009355	63826	73,007.88	1,143,858.00	47.19%	12.46%	29.93%	10.43%	76.08%	23.92%
UNILEVER CERT EN Amsterdam	NL0000009355	2192727	31,703.76	14,458.60	45.93%	28.85%	25.13%	0.09%	97.26%	2.74%
PHILIPS KON OTC	NL0000009538	56473	21,454.03	379,898.95	53.29%	10.80%	26.35%	9.56%	74.65%	25.35%
PHILIPS KON EN Amsterdam	NL0000009538	1883460	20,462.14	10,864.12	57.77%	25.39%	16.79%	0.05%	96.62%	3.38%
ING GROEP OTC	NL0000303600	64440	23,465.07	364,138.21	48.07%	14.13%	28.67%	9.12%	73.78%	26.22%
ING GROEP EN Amsterdam	NL0000303600	4170509	42,328.53	10,149.49	62.42%	21.79%	15.75%	0.04%	95.93%	4.07%
AEGON OTC	NL0000303709	27653	6,905.81	249,731.02	50.46%	0.00%	41.03%	8.51%	65.91%	34.09%
AEGON EN Amsterdam	NL0000303709	2390864	17,378.27	7,268.62	73.23%	0.00%	26.75%	0.02%	95.65%	4.35%
EuroStoxx50 OTC		2928411	2,200,140.11	751,308.51	45.32%	7.01%	35.63%	12.05%	73.98%	26.02%
EuroStoxx50 Primary Markets		118643111	2,177,355.11	18,352.14	49.75%	14.66%	35.48%	0.11%	95.71%	4.29%

Source: Chair of e-Finance, Goethe University, Celent

			January through April 2010							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
AB INBEV OTC	BE0003793107	29950	8,616.21	287,686.40	50.15%	0.00%	44.76%	5.10%	79.08%	20.92%
AB INBEV EN Brussels	BE0003793107	538784	7,036.87	13,060.65	51.91%	0.00%	47.98%	0.11%	95.08%	4.92%
DEUTSCHE BANK N OTC	DE0005140008	45413	22,743.13	500,806.68	42.62%	17.74%	31.62%	8.02%	77.06%	22.94%
DEUTSCHE BANK N Xetra	DE0005140008	972850	29,261.61	30,078.24	28.41%	21.75%	49.75%	0.09%	80.23%	19.77%
BASF SE OTC	DE0005151005	34120	31,210.49	914,727.26	45.97%	16.34%	29.82%	7.88%	82.93%	17.07%
BASF SE Xetra	DE0005151005	615902	17,372.92	28,207.27	28.97%	26.81%	44.16%	0.07%	92.19%	7.81%
DT TELEKOM N OTC	DE0005557508	27869	16,388.11	588,040.83	44.72%	13.53%	29.98%	11.76%	82.84%	17.16%
DT TELEKOM N Xetra	DE0005557508	522068	16,132.00	30,900.20	35.75%	21.11%	43.01%	0.13%	98.59%	1.41%
DT BOERSE N OTC	DE0005810055	17584	5,604.01	318,699.52	42.73%	0.00%	48.89%	8.38%	73.23%	26.77%
DT BOERSE N Xetra	DE0005810055	280561	6,197.61	22,090.06	35.57%	0.00%	64.36%	0.07%	84.94%	15.06%
RWE AG OTC	DE0007037129	27026	25,180.98	931,731.63	45.33%	15.04%	29.52%	10.11%	78.09%	21.91%
RWE AG Xetra	DE0007037129	437718	14,643.23	33,453.57	30.80%	22.54%	46.53%	0.13%	85.01%	14.99%
DAIMLER AG N OTC	DE0007100000	38543	16,556.28	429,553.44	41.61%	0.00%	50.12%	8.27%	78.13%	21.87%
DAIMLER AG N Xetra	DE0007100000	703661	18,754.39	26,652.59	31.62%	0.00%	68.32%	0.06%	84.75%	15.25%
SAP AG OTC	DE0007164600	31479	13,549.96	430,444.30	44.77%	15.52%	30.60%	9.11%	80.13%	19.87%
SAP AG Xetra	DE0007164600	464495	13,357.50	28,757.04	33.03%	22.77%	44.12%	0.08%	87.46%	12.54%
SIEMENS N OTC	DE0007236101	41838	59,414.36	1,420,105.10	43.45%	15.26%	31.53%	9.75%	78.90%	21.10%
SIEMENS N Xetra	DE0007236101	685719	23,454.86	34,204.77	28.08%	21.26%	50.57%	0.09%	86.09%	13.91%
ALLIANZ SE OTC	DE0008404005	33107	27,472.27	829,802.35	37.58%	20.84%	31.83%	9.75%	77.24%	22.76%
ALLIANZ SE Xetra	DE0008404005	610858	18,585.32	30,424.95	26.06%	23.14%	50.72%	0.08%	84.10%	15.90%
MUENCH. RUECK N OTC	DE0008430026	19894	27,572.59	1,385,974.93	34.72%	17.77%	35.48%	12.03%	68.21%	31.79%
MUENCH. RUECK N Xetra	DE0008430026	270373	12,390.08	45,825.87	24.08%	20.17%	55.25%	0.51%	73.13%	26.87%
BAYER N AG OTC	DE000BAY0017	8759	10,080.19	1,150,837.60	29.34%	16.97%	41.36%	12.33%	79.22%	20.78%
BAYER N AG Xetra	DE000BAY0017	531317	16,710.85	31,451.74	30.54%	24.64%	44.74%	0.08%	91.77%	8.23%
E.ON AG NA OTC	DE000ENAG999	14298	11,080.25	774,951.32	44.64%	17.46%	29.03%	8.87%	86.76%	13.24%
E.ON AG NA Xetra	DE000ENAG999	576326	18,713.21	32,469.84	30.30%	21.82%	47.80%	0.08%	95.75%	4.25%
BBVA OTC	ES0113211835	19751	61,253.46	3,101,284.14	17.87%	21.23%	38.68%	22.23%	71.86%	28.14%
BBVA Bolsa de Madrid	ES0113211835	1113982	30,437.65	27,323.29	38.77%	35.09%	25.88%	0.27%	98.83%	1.17%
BANCO SANTANDER OTC	ES0113900J37	21552	109,684.91	5,089,314.77	22.90%	29.61%	27.46%	20.03%	81.04%	18.96%
BANCO SANTANDER Bolsa de Madrid	ES0113900J37	1688472	47,915.76	28,378.18	40.42%	39.42%	19.78%	0.39%	99.66%	0.34%
IBERDROLA OTC	ES0144580Y14	8435	12,428.35	1,473,425.83	21.67%	22.49%	34.81%	21.03%	75.80%	24.20%
IBERDROLA Bolsa de Madrid	ES0144580Y14	704909	12,931.35	18,344.71	48.64%	35.61%	15.56%	0.19%	99.68%	0.32%
REPSOL YPF OTC	ES0173516115	8492	6,731.95	792,739.84	22.52%	11.39%	47.76%	18.33%	61.92%	38.08%
REPSOL YPF Bolsa de Madrid	ES0173516115	607411	11,235.74	18,497.76	48.32%	23.23%	28.27%	0.18%	96.96%	3.04%
TELEFONICA OTC	ES0178430E18	21347	30,253.43	1,417,221.41	23.43%	28.82%	28.31%	19.45%	76.41%	23.59%
TELEFONICA Bolsa de Madrid	ES0178430E18	1258330	40,832.81	32,450.00	34.19%	43.60%	21.78%	0.43%	99.02%	0.98%
NOKIA OTC	FI0009000681	43445	15,245.68	350,919.05	50.27%	29.35%	13.50%	0.02%	90.82%	9.18%
NOKIA Helsinki SE	FI0009000681	813990	18,649.03	22,910.64	41.42%	44.59%	13.85%	0.00%	99.43%	0.57%
CREDIT AGRICOLE OTC	FR0000045072	23233	5,559.44	239,290.81	54.23%	0.00%	38.15%	7.62%	78.03%	21.97%
CREDIT AGRICOLE EN Paris	FR0000045072	867404	7,944.23	9,158.63	69.04%	0.00%	30.90%	0.06%	95.89%	4.11%
AIR LIQUIDE OTC	FR0000120073	13382	4,945.04	369,529.10	42.27%	0.00%	47.07%	10.66%	68.99%	31.01%
AIR LIQUIDE EN Paris	FR0000120073	579806	6,507.24	11,223.13	56.34%	0.00%	43.59%	0.07%	93.66%	6.34%
CARREFOUR OTC	FR0000120172	25259	8,859.79	350,757.94	52.36%	0.00%	39.20%	8.44%	78.19%	21.81%
CARREFOUR EN Paris	FR0000120172	635228	8,326.79	13,108.35	54.86%	0.00%	45.01%	0.12%	93.91%	6.09%
TOTAL OTC	FR0000120271	54320	32,163.95	592,119.86	44.77%	0.00%	47.54%	7.68%	81.78%	18.22%
TOTAL EN Paris	FR0000120271	1470203	23,911.61	16,264.15	46.00%	0.00%	53.82%	0.19%	95.53%	4.47%
L OREAL OTC	FR0000120321	18072	6,783.23	375,344.47	46.39%	0.00%	45.21%	8.41%	73.98%	26.02%
L OREAL EN Paris	FR0000120321	466359	6,273.45	13,451.98	50.01%	0.00%	49.90%	0.08%	92.64%	7.36%

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			January through April 2010							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
SANOFI-AVENTIS OTC	FR0000120578	35748	16,811.65	470,282.28	43.48%	0.00%	47.17%	9.35%	78.32%	21.68%
SANOFI-AVENTIS EN Paris	FR0000120578	906435	15,487.64	17,086.33	44.85%	0.00%	54.95%	0.20%	93.91%	6.09%
AXA OTC	FR0000120628	32965	12,213.33	370,493.82	47.20%	0.00%	45.48%	7.31%	80.73%	19.27%
AXA EN Paris	FR0000120628	952611	10,723.23	11,256.67	61.10%	0.00%	38.81%	0.09%	95.82%	4.18%
DANONE OTC	FR0000120644	24656	10,671.15	432,801.20	43.90%	0.00%	47.24%	8.86%	75.31%	24.69%
DANONE EN Paris	FR0000120644	746680	9,095.08	12,180.70	55.72%	0.00%	44.17%	0.11%	94.80%	5.20%
L.V.M.H. OTC	FR0000121014	19917	6,607.20	331,736.72	43.56%	0.00%	47.62%	8.82%	75.19%	24.81%
L.V.M.H. EN Paris	FR0000121014	673661	8,401.00	12,470.67	52.08%	0.00%	47.84%	0.08%	93.83%	6.17%
SCHNEIDER ELECTR OTC	FR0000121972	20373	7,188.36	352,837.71	48.43%	0.00%	43.54%	8.03%	75.47%	24.53%
SCHNEIDER ELECTR EN Paris	FR0000121972	639620	7,755.26	12,124.79	51.19%	0.00%	48.75%	0.07%	93.37%	6.63%
UNIBAIL RODAMCO OTC	FR0000124711	17022	4,307.26	253,040.49	46.46%	0.00%	45.56%	7.98%	78.90%	21.10%
UNIBAIL RODAMCO EN Paris	FR0000124711	352383	6,267.21	17,785.21	43.28%	0.00%	56.53%	0.19%	93.90%	6.10%
SAINT-GOBAIN OTC	FR0000125007	21500	4,428.37	205,970.76	51.80%	0.00%	40.74%	7.46%	75.71%	24.29%
SAINT-GOBAIN EN Paris	FR0000125007	722274	7,758.92	10,742.35	57.81%	0.00%	42.14%	0.05%	94.03%	5.97%
VINCI OTC	FR0000125486	21062	6,013.79	285,527.77	55.58%	14.71%	22.47%	7.24%	77.78%	22.22%
VINCI EN Paris	FR0000125486	730406	7,068.51	9,677.50	62.52%	24.42%	13.01%	0.05%	94.61%	5.39%
VIVENDI OTC	FR0000127771	26653	12,973.13	486,741.86	47.59%	0.00%	43.54%	8.87%	78.67%	21.33%
VIVENDI EN Paris	FR0000127771	686836	8,689.02	12,650.79	55.07%	0.00%	44.84%	0.09%	96.09%	3.91%
SOCIETE GENERALE OTC	FR0000130809	34920	9,456.42	270,802.29	48.09%	0.00%	45.17%	6.74%	81.08%	18.92%
SOCIETE GENERALE EN Paris	FR0000130809	1403073	17,086.39	12,177.83	54.61%	0.00%	45.29%	0.10%	94.46%	5.54%
BNP PARIBAS OTC	FR0000131104	43508	18,545.61	426,257.39	49.37%	0.00%	43.53%	7.10%	82.42%	17.58%
BNP PARIBAS EN Paris	FR0000131104	1485780	19,978.63	13,446.56	55.18%	0.00%	44.70%	0.12%	94.92%	5.08%
FRANCE TELECOM OTC	FR0000133308	37974	14,839.55	390,781.92	50.87%	0.00%	41.50%	7.63%	83.58%	16.42%
FRANCE TELECOM EN Paris	FR0000133308	827199	11,816.50	14,284.95	51.90%	0.00%	47.96%	0.13%	97.42%	2.58%
GDF SUEZ OTC	FR0010208488	36230	15,936.51	439,870.63	50.09%	0.00%	42.68%	7.24%	81.07%	18.93%
GDF SUEZ EN Paris	FR0010208488	894800	10,552.87	11,793.55	56.65%	0.00%	43.24%	0.11%	95.43%	4.57%
ALSTOM OTC	FR0010220475	21924	3,338.97	152,297.61	54.98%	0.00%	38.98%	6.04%	78.45%	21.55%
ALSTOM EN Paris	FR0010220475	673314	6,861.88	10,191.20	58.42%	0.00%	41.54%	0.04%	92.34%	7.66%
CRH PLC OTC	IE0001827041	11261	2,184.86	194,020.51	39.06%	15.54%	37.80%	7.60%	64.82%	35.18%
CRH PLC Irland SE	IE0001827041	41850	2,622.99	62,676.01	45.46%	19.54%	32.64%	2.36%	76.25%	23.75%
GENERALI ASS OTC	IT0000062072	12224	5,045.99	412,793.61	40.32%	16.10%	34.13%	9.45%	79.71%	20.29%
GENERALI ASS Borsa Italiana	IT0000062072	603830	10,063.92	16,666.81	45.75%	26.98%	27.24%	0.04%	98.60%	1.40%
UNICREDIT OTC	IT0000064854	17214	13,165.95	764,839.68	39.37%	12.55%	33.83%	14.25%	87.95%	12.05%
UNICREDIT Borsa Italiana	IT0000064854	1868640	47,961.68	25,666.63	38.74%	20.29%	40.84%	0.13%	99.94%	0.06%
INTESA SANPAOLO OTC	IT0000072618	18149	8,891.99	489,944.06	43.75%	13.82%	32.39%	10.03%	85.51%	14.49%
INTESA SANPAOLO Borsa Italiana	IT0000072618	891533	16,303.57	18,287.12	44.74%	25.95%	29.27%	0.03%	99.78%	0.22%
ENEL OTC	IT0003128367	16744	9,386.98	560,617.74	40.40%	16.03%	32.77%	10.80%	84.15%	15.85%
ENEL Borsa Italiana	IT0003128367	757543	14,493.57	19,132.33	46.23%	26.62%	27.11%	0.05%	99.53%	0.47%
ENI OTC	IT0003132476	24713	13,597.77	550,227.47	40.29%	23.79%	25.46%	10.46%	88.44%	11.56%
ENI Borsa Italiana	IT0003132476	1000236	23,642.90	23,637.32	40.01%	38.89%	21.04%	0.06%	99.88%	0.12%
TELECOM ITALIA OTC	IT0003497168	15902	6,729.50	423,185.56	49.92%	0.00%	39.54%	10.54%	81.69%	18.31%
TELECOM ITALIA Borsa Italiana	IT0003497168	606060	8,942.19	14,754.63	53.95%	0.00%	46.02%	0.04%	99.42%	0.58%
ARCELORMITTAL OTC	LU0323134006	66989	21,935.86	327,454.67	38.82%	27.01%	27.74%	6.43%	85.14%	14.86%
ARCELORMITTAL EN Amsterdam	LU0323134006	1614375	25,110.94	15,554.59	42.36%	29.79%	27.77%	0.08%	95.06%	4.94%
UNILEVER CERT OTC	NL0000009355	29920	18,286.72	611,187.29	42.80%	19.30%	30.02%	7.87%	82.77%	17.23%
UNILEVER CERT EN Amsterdam	NL0000009355	721090	10,820.13	15,005.25	48.03%	27.75%	24.11%	0.12%	97.01%	2.99%
PHILIPS KON OTC	NL0000009538	33974	10,303.17	303,266.25	50.69%	16.23%	26.51%	6.58%	80.46%	19.54%
PHILIPS KON EN Amsterdam	NL0000009538	746603	10,230.02	13,702.09	50.03%	28.03%	21.86%	0.08%	94.48%	5.52%
ING GROEP OTC	NL0000303600	35281	8,536.48	241,956.78	53.21%	13.79%	26.24%	6.76%	79.13%	20.87%
ING GROEP EN Amsterdam	NL0000303600	1560033	16,360.30	10,487.15	63.40%	21.67%	14.87%	0.06%	96.14%	3.86%
AEGON OTC	NL0000303709	12081	3,115.32	257,869.14	51.94%	0.00%	39.71%	8.35%	70.40%	29.60%
AEGON EN Amsterdam	NL0000303709	763548	6,471.59	8,475.68	67.35%	0.00%	32.63%	0.02%	94.92%	5.08%
EuroStoxx50 OTC		1316072	833,889.94	633,620.30	44.32%	10.13%	36.43%	9.12%	79.70%	20.30%
EuroStoxx50 Primary Markets		40287139	768,142.04	19,066.68	46.65%	15.96%	37.27%	0.12%	94.95%	5.05%

Source: Chair of e-Finance, Goethe University, Celent

			Total (January 2008 through April 2010)							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
AB INBEV OTC	BE0003793107	83303	18,035.94	216,510.10	52.97%	0.00%	41.93%	5.10%	81.06%	18.94%
AB INBEV EN Brussels	BE0003793107	1579351	20,516.25	12,990.31	53.63%	0.00%	46.25%	0.11%	95.26%	4.74%
DEUTSCHE BANK N OTC	DE0005140008	260359	258,303.12	992,103.69	43.79%	14.54%	30.25%	11.42%	72.28%	27.72%
DEUTSCHE BANK N Xetra	DE0005140008	8172984	229,955.94	28,136.11	34.01%	21.60%	44.27%	0.11%	81.81%	18.19%
BASF SE OTC	DE0005151005	177118	144,739.59	817,193.03	41.63%	14.51%	32.18%	11.67%	75.19%	24.81%
BASF SE Xetra	DE0005151005	3997503	124,415.96	31,123.42	29.14%	22.20%	48.57%	0.09%	89.95%	10.05%
DT TELEKOM N OTC	DE0005557508	187324	289,013.42	1,542,853.14	39.65%	12.41%	32.58%	15.36%	78.26%	21.74%
DT TELEKOM N Xetra	DE0005557508	3491654	161,091.51	46,136.16	30.34%	17.11%	52.02%	0.52%	96.54%	3.46%
DT BOERSE N OTC	DE0005810055	135350	68,686.92	507,476.32	39.37%	0.00%	50.11%	10.52%	69.17%	30.83%
DT BOERSE N Xetra	DE0005810055	3073712	78,187.56	25,437.50	32.73%	0.00%	67.18%	0.08%	80.26%	19.74%
RWE AG OTC	DE0007037129	146196	150,179.71	1,027,249.08	36.70%	14.43%	34.28%	14.59%	68.50%	31.50%
RWE AG Xetra	DE0007037129	4026180	131,061.41	32,552.30	29.15%	20.73%	50.02%	0.10%	84.62%	15.38%
DAIMLER AG N OTC	DE0007100000	216388	195,560.01	903,747.04	41.51%	0.00%	45.98%	12.51%	70.23%	29.77%
DAIMLER AG N Xetra	DE0007100000	5969058	181,135.07	30,345.67	32.64%	0.00%	67.25%	0.11%	81.30%	18.70%
SAP AG OTC	DE0007164600	159460	119,268.68	747,953.57	39.00%	13.57%	33.59%	13.84%	70.49%	29.51%
SAP AG Xetra	DE0007164600	3971354	125,820.73	31,682.07	30.07%	21.14%	48.69%	0.10%	85.32%	14.68%
SIEMENS N OTC	DE0007236101	220068	310,598.93	1,411,377.05	37.29%	13.62%	35.16%	13.94%	70.75%	29.25%
SIEMENS N Xetra	DE0007236101	6034124	213,047.41	35,307.10	26.79%	20.79%	52.31%	0.11%	85.08%	14.92%
ALLIANZ SE OTC	DE0008404005	211114	248,362.04	1,176,435.66	39.04%	13.60%	34.00%	13.35%	69.45%	30.55%
ALLIANZ SE Xetra	DE0008404005	6335944	200,770.30	31,687.51	29.57%	21.53%	48.78%	0.12%	82.73%	17.27%
MUENCH. RUECK N OTC	DE0008430026	124887	146,556.00	1,173,508.87	34.08%	14.67%	36.32%	14.93%	63.28%	36.72%
MUENCH. RUECK N Xetra	DE0008430026	3463022	107,020.00	30,903.65	27.41%	24.92%	47.54%	0.13%	80.36%	19.64%
BAYER N AG OTC	DE000BAY0017	140239	135,127.45	963,551.18	35.75%	14.75%	35.46%	14.04%	72.67%	27.33%
BAYER N AG Xetra	DE000BAY0017	4171774	138,579.54	33,218.37	27.25%	20.71%	51.95%	0.09%	90.43%	9.57%
E.ON AG NA OTC	DE000ENAG999	104553	94,160.89	900,604.35	49.68%	11.11%	27.27%	11.94%	80.37%	19.63%
E.ON AG NA Xetra	DE000ENAG999	3539765	118,321.37	33,426.34	29.02%	21.72%	49.17%	0.08%	95.41%	4.59%
BBVA OTC	ES0113211835	102516	314,641.85	3,069,197.46	17.87%	20.35%	39.20%	22.58%	70.08%	29.92%
BBVA Bolsa de Madrid	ES0113211835	6119089	213,523.17	34,894.60	36.90%	29.94%	32.77%	0.39%	98.29%	1.71%
BANCO SANTANDER OTC	ES0113900J37	131862	495,092.56	3,754,626.53	19.91%	24.48%	32.30%	23.30%	77.56%	22.44%
BANCO SANTANDER Bolsa de Madrid	ES0113900J37	9236791	375,157.75	40,615.59	37.82%	34.17%	27.52%	0.49%	99.58%	0.42%
IBERDROLA OTC	ES0144580Y14	67505	122,185.83	1,810,026.32	19.64%	19.39%	38.67%	22.31%	74.26%	25.74%
IBERDROLA Bolsa de Madrid	ES0144580Y14	4440344	135,144.39	30,435.57	40.66%	31.17%	27.80%	0.37%	99.33%	0.67%
REPSOL YPF OTC	ES0173516115	73542	106,109.46	1,442,841.67	22.10%	13.72%	45.59%	18.59%	62.92%	37.08%
REPSOL YPF Bolsa de Madrid	ES0173516115	4058463	93,631.41	23,070.66	42.49%	21.41%	35.84%	0.25%	95.33%	4.67%
TELEFONICA OTC	ES0178430E18	154318	350,586.71	2,271,845.88	18.98%	28.71%	33.69%	18.62%	77.18%	22.82%
TELEFONICA Bolsa de Madrid	ES0178430E18	7373583	326,436.67	44,271.11	31.70%	38.96%	28.71%	0.63%	98.44%	1.56%
NOKIA OTC	FI0009000681	223248	266,512.82	1,193,797.12	43.16%	26.44%	19.78%	10.62%	85.64%	14.36%
NOKIA Helsinki SE	FI0009000681	6231475	203,409.41	32,642.26	34.64%	41.82%	23.20%	0.33%	98.68%	1.32%
CREDIT AGRICOLE OTC	FR0000045072	108913	41,269.74	378,923.90	43.28%	0.00%	44.79%	11.93%	67.21%	32.79%
CREDIT AGRICOLE EN Paris	FR0000045072	5671168	67,868.35	11,967.26	62.03%	0.00%	37.87%	0.10%	92.91%	7.09%
AIR LIQUIDE OTC	FR0000120073	91718	34,748.85	378,866.20	38.12%	0.00%	49.85%	12.03%	64.88%	35.12%
AIR LIQUIDE EN Paris	FR0000120073	4304996	53,085.45	12,331.13	55.90%	0.00%	44.01%	0.09%	92.23%	7.77%
CARREFOUR OTC	FR0000120172	124246	69,067.55	555,893.56	45.14%	0.00%	41.37%	13.49%	67.51%	32.49%
CARREFOUR EN Paris	FR0000120172	4886902	73,722.18	15,085.67	49.41%	0.00%	50.44%	0.15%	92.09%	7.91%
TOTAL OTC	FR0000120271	281313	331,997.36	1,180,170.68	39.57%	0.00%	48.44%	11.99%	73.62%	26.38%
TOTAL EN Paris	FR0000120271	10722492	240,994.52	22,475.61	38.12%	0.00%	61.63%	0.24%	91.90%	8.10%
L OREAL OTC	FR0000120321	104814	45,111.71	430,397.80	41.09%	0.00%	46.75%	12.15%	65.82%	34.18%
L OREAL EN Paris	FR0000120321	3932101	56,467.70	14,360.70	50.63%	0.00%	49.26%	0.11%	90.98%	9.02%

Source: Chair of e-Finance, Goethe University, Celent

		Total (January 2008 through April 2010)								
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	RS < x ≤ SMS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
SANOFI-AVENTIS OTC	FR0000120578	192568	146,039.61	758,379.45	41.08%	0.00%	46.75%	12.17%	72.03%	27.97%
SANOFI-AVENTIS EN Paris	FR0000120578	7026257	132,642.43	18,878.11	41.61%	0.00%	58.20%	0.19%	92.61%	7.39%
AXA OTC	FR0000120628	160404	95,771.18	597,062.26	41.95%	0.00%	45.38%	12.67%	68.91%	31.09%
AXA EN Paris	FR0000120628	7748429	124,015.92	16,005.30	50.98%	0.00%	48.87%	0.15%	92.04%	7.96%
DANONE OTC	FR0000120644	135775	60,961.86	448,991.81	39.22%	0.00%	48.25%	12.53%	67.59%	32.41%
DANONE EN Paris	FR0000120644	5514386	78,229.13	14,186.37	49.43%	0.00%	50.44%	0.12%	92.74%	7.26%
L.V.M.H. OTC	FR0000121014	104984	53,812.98	512,582.68	38.80%	0.00%	48.61%	12.59%	65.49%	34.51%
L.V.M.H. EN Paris	FR0000121014	4568118	62,827.26	13,753.42	51.84%	0.00%	48.06%	0.10%	92.46%	7.54%
SCHNEIDER ELECTR OTC	FR0000121972	114840	45,390.89	395,253.32	40.42%	0.00%	48.86%	10.72%	68.19%	31.81%
SCHNEIDER ELECTR EN Paris	FR0000121972	4524065	56,616.37	12,514.49	52.22%	0.00%	47.69%	0.08%	92.63%	7.37%
UNIBAIL RODAMCO OTC	FR0000124711	81605	48,862.51	598,768.63	38.33%	0.00%	50.96%	10.71%	70.12%	29.88%
UNIBAIL RODAMCO EN Paris	FR0000124711	2530382	41,066.32	16,229.30	46.37%	0.00%	53.52%	0.12%	95.08%	4.92%
SAINT-GOBAIN OTC	FR0000125007	111870	44,808.95	400,544.80	46.35%	0.00%	43.19%	10.47%	68.48%	31.52%
SAINT-GOBAIN EN Paris	FR0000125007	5310687	61,548.43	11,589.54	58.19%	0.00%	41.72%	0.09%	92.65%	7.35%
VINCI OTC	FR0000125486	102073	47,726.44	467,571.60	44.02%	14.77%	29.33%	11.88%	65.80%	34.20%
VINCI EN Paris	FR0000125486	5046154	56,954.90	11,286.79	60.53%	23.53%	15.85%	0.09%	92.67%	7.33%
VIVENDI OTC	FR0000127771	185305	69,093.62	372,864.32	45.11%	0.00%	44.80%	10.09%	76.06%	23.94%
VIVENDI EN Paris	FR0000127771	5757851	83,509.58	14,503.60	49.23%	0.00%	50.65%	0.13%	95.25%	4.75%
SOCIETE GENERALE OTC	FR0000130809	159408	167,206.76	1,048,923.28	40.84%	0.00%	47.75%	11.40%	70.22%	29.78%
SOCIETE GENERALE EN Paris	FR0000130809	8924260	162,059.82	18,159.47	47.66%	0.00%	52.15%	0.19%	88.19%	11.81%
BNP PARIBAS OTC	FR0000131104	211747	138,690.00	654,979.76	41.36%	0.00%	47.14%	11.50%	71.97%	28.03%
BNP PARIBAS EN Paris	FR0000131104	10376578	180,000.37	17,346.79	48.69%	0.00%	51.13%	0.18%	92.03%	7.97%
FRANCE TELECOM OTC	FR0000133308	215104	153,526.41	713,731.09	41.77%	0.00%	46.11%	12.12%	76.30%	23.70%
FRANCE TELECOM EN Paris	FR0000133308	7151421	139,561.76	19,515.25	42.91%	0.00%	56.89%	0.20%	95.85%	4.15%
GDF SUEZ OTC	FR0010208488	171196	89,341.98	521,869.54	48.37%	0.00%	43.23%	8.39%	78.25%	21.75%
GDF SUEZ EN Paris	FR0010208488	5625547	74,023.29	13,158.42	55.63%	0.00%	44.23%	0.14%	94.75%	5.25%
ALSTOM OTC	FR0010220475	111126	32,051.52	288,425.06	44.66%	0.00%	45.71%	9.63%	69.47%	30.53%
ALSTOM EN Paris	FR0010220475	5396853	58,219.71	10,787.71	60.17%	0.00%	39.78%	0.05%	91.74%	8.26%
CRH PLC OTC	IE0001827041	60907	13,924.11	228,612.60	36.70%	13.79%	38.93%	10.58%	58.88%	41.12%
CRH PLC Irland SE	IE0001827041	283928	22,253.94	78,378.83	40.09%	17.45%	39.41%	3.05%	68.94%	31.06%
GENERALI ASS OTC	IT0000062072	56470	79,065.88	1,400,139.59	33.53%	13.19%	37.52%	15.75%	69.27%	30.73%
GENERALI ASS Borsa Italiana	IT0000062072	4368328	81,290.55	18,609.08	45.13%	24.03%	30.80%	0.04%	98.40%	1.60%
UNICREDIT OTC	IT0000064854	99682	136,249.01	1,366,836.66	36.71%	11.86%	35.70%	15.73%	86.83%	13.17%
UNICREDIT Borsa Italiana	IT0000064854	13584444	335,805.78	24,719.88	45.51%	18.43%	35.95%	0.10%	99.95%	0.05%
INTESA SANPAOLO OTC	IT0000072618	100408	109,844.88	1,093,985.37	38.85%	12.25%	35.72%	13.19%	81.15%	18.85%
INTESA SANPAOLO Borsa Italiana	IT0000072618	6702425	143,301.35	21,380.52	44.24%	22.06%	33.67%	0.04%	99.76%	0.24%
ENEL OTC	IT0003128367	92763	154,501.89	1,665,555.18	39.94%	13.23%	34.17%	12.66%	81.55%	18.45%
ENEL Borsa Italiana	IT0003128367	6075504	118,768.98	19,548.83	49.73%	20.54%	29.68%	0.05%	99.52%	0.48%
ENI OTC	IT0003132476	145189	207,329.83	1,427,999.54	36.03%	21.67%	28.69%	13.60%	84.96%	15.04%
ENI Borsa Italiana	IT0003132476	8437984	298,358.38	35,358.97	36.39%	36.89%	26.64%	0.07%	99.87%	0.13%
TELECOM ITALIA OTC	IT0003497168	74287	59,632.38	802,729.69	45.10%	0.00%	42.24%	12.65%	76.77%	23.23%
TELECOM ITALIA Borsa Italiana	IT0003497168	4750043	80,775.78	17,005.27	54.64%	0.00%	45.32%	0.05%	99.11%	0.89%
ARCELORMITTAL OTC	LU0323134006	222721	159,966.24	718,235.99	36.21%	19.32%	31.80%	12.67%	73.15%	26.85%
ARCELORMITTAL EN Amsterdam	LU0323134006	8635636	144,749.41	16,761.87	43.99%	26.38%	29.55%	0.08%	93.47%	6.53%
UNILEVER CERT OTC	NL0000009355	138943	239,437.76	1,723,280.51	39.39%	14.15%	34.21%	12.25%	72.82%	27.18%
UNILEVER CERT EN Amsterdam	NL0000009355	5542335	100,450.18	18,124.16	39.38%	27.22%	33.26%	0.14%	95.80%	4.20%
PHILIPS KON OTC	NL0000009538	127204	76,960.14	605,013.56	45.80%	12.34%	30.78%	11.08%	70.98%	29.02%
PHILIPS KON EN Amsterdam	NL0000009538	4919130	73,666.48	14,975.51	49.28%	25.32%	25.29%	0.10%	93.36%	6.64%
ING GROEP OTC	NL0000303600	158177	115,984.51	733,257.74	41.05%	13.58%	32.57%	12.79%	66.71%	33.29%
ING GROEP EN Amsterdam	NL0000303600	9371295	151,330.41	16,148.29	52.14%	21.52%	26.22%	0.12%	91.05%	8.95%
AEGON OTC	NL0000303709	71339	108,663.00	1,523,192.08	43.03%	0.00%	46.08%	10.89%	61.08%	38.92%
AEGON EN Amsterdam	NL0000303709	5182731	53,346.54	10,293.13	63.62%	0.00%	36.33%	0.06%	92.31%	7.69%
EuroStoxx50 OTC		7036449	7,010,761.51	996,349.37	39.35%	8.77%	39.03%	12.85%	72.57%	27.43%
EuroStoxx50 Primary Markets		288158600	6,584,737.14	22,851.09	43.63%	14.03%	42.17%	0.17%	93.04%	6.96%

Source: Chair of e-Finance, Goethe University, Celent

Less Liquid Instruments

		2008							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
D'IETEREN OTC	BE0003669802	2364	174.25	73,708.12	49.45%	46.19%	4.36%	52.50%	47.50%
D'IETEREN EN Brussels	BE0003669802	70939	398.24	5,613.77	83.27%	16.66%	0.07%	88.73%	11.27%
BEFIMMO-SICAFI OTC	BE0003678894	1635	1,030.98	630,570.06	36.21%	58.78%	5.02%	41.53%	58.47%
BEFIMMO-SICAFI EN Brussels	BE0003678894	55609	400.52	7,202.48	75.17%	24.73%	0.10%	83.21%	16.79%
ElringKlinger AG Namens-Aktien o.N. OTC	DE0007856023	3919	411.21	104,927.55	49.96%	43.17%	6.86%	49.68%	50.32%
ElringKlinger AG Namens-Aktien o.N. Xetra	DE0007856023	81263	578.46	7,118.35	71.32%	28.66%	0.02%	70.87%	29.13%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES OTC	ES0121975017	1205	60.85	50,501.86	31.45%	63.90%	4.65%	52.95%	47.05%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES Bolsa de Madrid	ES0121975017	41625	387.35	9,305.72	72.30%	27.47%	0.23%	88.57%	11.43%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO OTC	ES0176252718	3392	392.54	115,726.49	40.71%	48.41%	10.88%	49.09%	50.91%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO Bolsa de Madrid	ES0176252718	178397	1,119.71	6,276.53	78.45%	21.45%	0.10%	92.37%	7.63%
Kemira Oyj OTC	FI0009004824	4740	216.10	45,590.05	72.17%	24.54%	3.29%	76.27%	23.73%
Kemira Oyj Helsinki SE	FI0009004824	165770	1,030.96	6,219.24	84.30%	15.53%	0.17%	92.58%	7.42%
Cargotec Oyj OTC	FI0009013429	7277	454.74	62,490.32	67.78%	27.84%	4.38%	71.88%	28.12%
Cargotec Oyj Helsinki SE	FI0009013429	252383	1,872.24	7,418.24	76.13%	23.71%	0.16%	82.77%	17.23%
VICAT OTC	FR0000031775	1638	257.84	157,411.67	43.83%	48.84%	7.33%	43.71%	56.29%
VICAT EN Paris	FR0000031775	92485	526.85	5,696.63	87.21%	12.69%	0.10%	86.81%	13.19%
FAURECIA OTC	FR0000121147	873	20.74	23,755.78	67.35%	30.81%	1.83%	65.86%	34.14%
FAURECIA EN Paris	FR0000121147	62274	162.34	2,606.81	94.66%	5.33%	0.00%	93.43%	6.57%
CREDITO VALTELLINESE OTC	IT0000064516	1293	32.86	25,410.73	53.29%	45.48%	1.24%	62.34%	37.66%
CREDITO VALTELLINESE Borsa Italiana	IT0000064516	103226	361.75	3,504.47	89.95%	10.03%	0.03%	96.22%	3.78%
HERA OTC	IT0001250932	4535	557.55	122,943.15	44.23%	47.08%	8.69%	46.59%	53.41%
HERA Borsa Italiana	IT0001250932	272642	1,376.83	5,049.95	86.40%	13.55%	0.05%	89.41%	10.59%
SLIGRO FOOD GROUP OTC	NL0000817179	1579	111.29	70,479.20	36.92%	58.33%	4.75%	38.13%	61.87%
SLIGRO FOOD GROUP EN Amsterdam	NL0000817179	61629	382.06	6,199.42	83.03%	16.82%	0.15%	84.68%	15.32%
Less Liquids OTC		34450	3,720.95	108,010.05	53.46%	40.81%	5.73%	57.56%	42.44%
Less Liquids Primary Markets		1438242	8,598.79	5,978.68	82.04%	17.86%	0.10%	87.93%	12.07%

Source: Chair of e-Finance, Goethe University, Celent

			2009						
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	≤ RS	SMS < x ≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
D'IETEREN OTC	BE0003669802	2362	110.80	46,910.38	52.75%	44.83%	2.41%	57.49%	42.51%
D'IETEREN EN Brussels	BE0003669802	79355	335.29	4,225.20	86.19%	13.78%	0.03%	90.71%	9.29%
BEFIMMO-SICAFI OTC	BE0003678894	2932	253.94	86,610.87	46.04%	48.33%	5.63%	50.20%	49.80%
BEFIMMO-SICAFI EN Brussels	BE0003678894	89403	461.18	5,158.42	83.58%	16.36%	0.06%	88.31%	11.69%
ElringKlinger AG Namens-Aktien o.N. OTC	DE0007856023	3238	181.73	56,123.36	59.36%	36.66%	3.98%	59.17%	40.83%
ElringKlinger AG Namens-Aktien o.N. Xetra	DE0007856023	74062	307.79	4,155.90	86.29%	13.70%	0.01%	86.06%	13.94%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES OTC	ES0121975017	1245	59.73	47,978.38	35.98%	60.08%	3.94%	54.30%	45.70%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES Bolsa de Madrid	ES0121975017	52701	462.24	8,770.90	71.77%	27.98%	0.25%	89.32%	10.68%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO OTC	ES0176252718	1520	136.40	89,734.04	36.75%	60.34%	2.92%	51.38%	48.62%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO Bolsa de Madrid	ES0176252718	121488	503.35	4,143.19	86.75%	13.20%	0.05%	95.95%	4.05%
Kemira Oyj OTC	FI0009004824	3738	78.36	20,963.02	78.71%	19.50%	1.79%	84.38%	15.62%
Kemira Oyj Helsinki SE	FI0009004824	135605	635.86	4,689.05	87.33%	12.57%	0.10%	94.38%	5.62%
Cargotec Oyj OTC	FI0009013429	2358	90.79	38,502.41	63.61%	33.08%	3.31%	68.15%	31.85%
Cargotec Oyj Helsinki SE	FI0009013429	154283	632.20	4,097.67	88.62%	11.31%	0.07%	93.52%	6.48%
VICAT OTC	FR0000031775	2108	173.46	82,288.31	60.58%	36.20%	3.23%	59.96%	40.04%
VICAT EN Paris	FR0000031775	84099	342.99	4,078.35	89.72%	10.23%	0.05%	89.39%	10.61%
FAURECIA OTC	FR0000121147	2208	67.02	30,354.38	73.51%	23.78%	2.72%	72.46%	27.54%
FAURECIA EN Paris	FR0000121147	249897	939.80	3,760.74	88.43%	11.56%	0.01%	86.20%	13.80%
CREDITO VALTELLINESE OTC	IT0000064516	2927	134.37	45,908.75	60.61%	35.33%	4.07%	69.46%	30.54%
CREDITO VALTELLINESE Borsa Italiana	IT0000064516	164597	543.51	3,302.05	92.80%	7.18%	0.02%	96.92%	3.08%
HERA OTC	IT0001250932	4133	157.79	38,177.71	64.84%	30.20%	4.96%	67.05%	32.95%
HERA Borsa Italiana	IT0001250932	240784	615.71	2,557.11	94.69%	5.29%	0.01%	96.71%	3.29%
SLIGRO FOOD GROUP OTC	NL0000817179	2195	85.24	38,833.91	53.44%	43.42%	3.14%	54.90%	45.10%
SLIGRO FOOD GROUP EN Amsterdam	NL0000817179	61065	283.29	4,639.08	88.04%	11.84%	0.12%	89.88%	10.12%
MEDIQ OTC	NL0009103530	2642	58.70	22,218.38	67.56%	27.55%	4.88%	67.60%	32.40%
MEDIQ EN Amsterdam	NL0009103530	66960	278.06	4,152.70	93.06%	6.75%	0.19%	93.11%	6.89%
Less Liquids OTC		33606	1,588.34	47,263.62	60.29%	35.89%	3.81%	64.34%	35.66%
Less Liquids Primary Markets		1574299	6,342.86	4,029.01	88.85%	11.10%	0.05%	92.15%	7.85%

Source: Chair of e-Finance, Goethe University, Celent

			January through April 2010						
			Total	Avg.					
			Turnover	Turnover		SMS < x			
Name/Venue	ISIN	Trades	(EURm)	(EUR)	≤ RS	≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
D'IETEREN OTC	BE0003669802	1701	72.97	42,897.96	54.03%	41.62%	4.35%	60.49%	39.51%
D'IETEREN EN Brussels	BE0003669802	43324	245.23	5,660.31	81.70%	18.24%	0.06%	87.27%	12.73%
BEFIMMO-SICAFI OTC	BE0003678894	1052	67.42	64,087.19	55.99%	40.02%	3.99%	59.98%	40.02%
BEFIMMO-SICAFI EN Brussels	BE0003678894	24044	115.96	4,822.89	86.27%	13.66%	0.07%	90.09%	9.91%
ElringKlinger AG Namens-Aktien o.N. OTC	DE0007856023	1715	54.56	31,813.07	67.29%	29.33%	3.38%	67.17%	32.83%
ElringKlinger AG Namens-Aktien o.N. Xetra	DE0007856023	28659	138.50	4,832.62	83.91%	16.05%	0.03%	83.69%	16.31%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES OTC	ES0121975017	590	30.89	52,353.89	36.61%	58.14%	5.25%	56.44%	43.56%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES Bolsa de Madrid	ES0121975017	32793	290.91	8,871.04	67.91%	31.84%	0.24%	88.73%	11.27%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO OTC	ES0176252718	726	104.69	144,207.44	28.00%	62.22%	9.78%	37.74%	62.26%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO Bolsa de Madrid	ES0176252718	47655	204.83	4,298.20	86.61%	13.24%	0.14%	96.21%	3.79%
Kemira Oyj OTC	FI0009004824	2617	87.98	33,618.95	66.87%	31.37%	1.76%	77.26%	22.74%
Kemira Oyj Helsinki SE	FI0009004824	89572	493.02	5,504.18	84.52%	15.34%	0.14%	92.81%	7.19%
Cargotec Oyj OTC	FI0009013429	2758	207.95	75,400.56	66.35%	28.57%	5.08%	72.44%	27.56%
Cargotec Oyj Helsinki SE	FI0009013429	70237	374.73	5,335.28	85.12%	14.79%	0.09%	90.74%	9.26%
VICAT OTC	FR0000031775	893	160.72	179,978.94	57.45%	39.87%	2.69%	57.11%	42.89%
VICAT EN Paris	FR0000031775	35832	131.71	3,675.66	91.84%	8.11%	0.05%	91.58%	8.42%
FAURECIA OTC	FR0000121147	1556	75.22	48,341.63	55.40%	40.23%	4.37%	52.89%	47.11%
FAURECIA EN Paris	FR0000121147	124714	583.21	4,676.35	83.43%	16.56%	0.02%	80.39%	19.61%
CREDITO VALTELLINESE OTC	IT0000064516	1200	107.54	89,614.55	60.08%	36.25%	3.67%	67.25%	32.75%
CREDITO VALTELLINESE Borsa Italiana	IT0000064516	67538	263.46	3,900.86	91.91%	8.05%	0.04%	97.34%	2.66%
HERA OTC	IT0001250932	1825	45.58	24,975.91	69.48%	28.44%	2.08%	72.00%	28.00%
HERA Borsa Italiana	IT0001250932	62072	174.86	2,817.04	93.33%	6.66%	0.02%	96.23%	3.77%
SLIGRO FOOD GROUP OTC	NL0000817179	1080	45.68	42,293.97	53.52%	44.63%	1.85%	54.54%	45.46%
SLIGRO FOOD GROUP EN Amsterdam	NL0000817179	20770	80.88	3,894.06	89.78%	10.15%	0.07%	90.86%	9.14%
MEDIQ OTC	NL0009103530	1851	42.64	23,034.74	74.77%	19.61%	5.62%	74.77%	25.23%
MEDIQ EN Amsterdam	NL0009103530	26380	105.29	3,991.16	92.27%	7.49%	0.25%	92.30%	7.70%
Less Liquids OTC		19564	1,103.84	56,422.08	61.20%	34.68%	4.12%	65.76%	34.24%
Less Liquids Primary Markets		673590	3,203.27	4,755.52	85.99%	13.94%	0.07%	90.12%	9.88%

Source: Chair of e-Finance, Goethe University, Celent

		Total (January 2008 through April 2010)							
Name/Venue	ISIN	Trades	Total Turnover (EURm)	Avg. Turnover (EUR)	SMS < x ≤ RS	≤ LIS	> LIS	≤ ANOMIS	> ANOMIS
D'IETEREN OTC	BE0003669802	6427	358.02	55705.27	51.87%	44.48%	3.64%	56.45%	43.55%
D'IETEREN EN Brussels	BE0003669802	193618	978.75	5055.08	84.12%	15.83%	0.05%	89.21%	10.79%
BEFIMMO-SICAFI OTC	BE0003678894	5619	1,352.34	240673.58	45.04%	49.81%	5.14%	49.51%	50.49%
BEFIMMO-SICAFI EN Brussels	BE0003678894	169056	977.66	5783.07	81.19%	18.73%	0.08%	86.89%	13.11%
ElringKlinger AG Namens-Aktien o.N. OTC	DE0007856023	8872	647.50	72982.19	56.74%	38.12%	5.14%	56.53%	43.47%
ElringKlinger AG Namens-Aktien o.N. Xetra	DE0007856023	183984	1,024.75	5569.79	79.31%	20.67%	0.02%	78.98%	21.02%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES OTC	ES0121975017	3040	151.48	49827.84	34.31%	61.22%	4.47%	54.18%	45.82%
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES Bolsa de Madrid	ES0121975017	127119	1,140.49	8971.86	70.98%	28.83%	0.19%	88.92%	11.08%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO OTC	ES0176252718	5638	633.63	112386.41	37.46%	52.38%	10.16%	48.24%	51.76%
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO Bolsa de Madrid	ES0176252718	347540	1,827.89	5259.52	82.49%	17.44%	0.06%	94.15%	5.85%
Kemira Oyj OTC	FI0009004824	11095	382.44	34469.35	73.12%	24.45%	2.42%	79.23%	20.77%
Kemira Oyj Helsinki SE	FI0009004824	390947	2,159.84	5524.64	85.40%	14.46%	0.14%	93.26%	6.74%
Cargotec Oyj OTC	FI0009013429	12393	753.49	60799.28	66.67%	29.00%	4.33%	71.30%	28.70%
Cargotec Oyj Helsinki SE	FI0009013429	476903	2,879.17	6037.23	81.49%	18.39%	0.12%	87.42%	12.58%
VICAT OTC	FR0000031775	4639	592.03	127619.16	54.06%	41.37%	4.57%	53.68%	46.32%
VICAT EN Paris	FR0000031775	212416	1,001.54	4715.01	88.98%	10.94%	0.07%	88.64%	11.36%
FAURECIA OTC	FR0000121147	4637	162.98	35147.91	66.27%	30.62%	3.11%	64.65%	35.35%
FAURECIA EN Paris	FR0000121147	436885	1,685.34	3857.63	87.89%	12.10%	0.01%	85.57%	14.43%
CREDITO VALTELLINESE OTC	IT0000064516	5420	274.77	50695.29	58.75%	37.95%	3.30%	67.27%	32.73%
CREDITO VALTELLINESE Borsa Italiana	IT0000064516	335361	1,168.72	3484.95	91.74%	8.23%	0.02%	96.79%	3.21%
HERA OTC	IT0001250932	10493	760.92	72516.60	56.74%	37.19%	6.07%	59.07%	40.93%
HERA Borsa Italiana	IT0001250932	575498	2,167.40	3766.12	90.62%	9.35%	0.03%	93.20%	6.80%
SLIGRO FOOD GROUP OTC	NL0000817179	4854	242.20	49897.94	48.08%	48.54%	3.38%	49.36%	50.64%
SLIGRO FOOD GROUP EN Amsterdam	NL0000817179	143464	746.23	5201.51	86.14%	13.74%	0.13%	87.79%	12.21%
MEDIQ OTC	NL0009103530	4493	101.34	22554.70	70.53%	24.28%	5.19%	70.55%	29.45%
MEDIQ EN Amsterdam	NL0009103530	93340	383.35	4107.04	92.83%	6.96%	0.21%	92.88%	7.12%
Less Liquids OTC		87620	6,413.13	73,192.52	57.81%	37.56%	4.64%	61.99%	38.01%
Less Liquids Primary Markets		3686131	18,144.92	4,922.48	85.67%	14.26%	0.07%	90.13%	9.87%

Source: Chair of e-Finance, Goethe University, Celent

Tables of Parameters SMS, LIS, and ANOMIS

Table 5: Tables of Parameters SMS, LIS, and ANOMIS

Name	ISIN	SMS	LIS	ANOMIS
AB INBEV EN Brussels	BE0003793107	7500	500000	35705
DEUTSCHE BANK N Xetra	DE0005140008	15000	500000	36071
BASF SE Xetra	DE0005151005	15000	500000	56189
DT TELEKOM N Xetra	DE0005557508	15000	500000	175207
DT BOERSE N Xetra	DE0005810055	7500	500000	30710
RWE AG Xetra	DE0007037129	15000	500000	46425
DAIMLER AG N Xetra	DE0007100000	7500	500000	38164
SAP AG Xetra	DE0007164600	15000	500000	46458
SIEMENS N Xetra	DE0007236101	15000	500000	52282
ALLIANZ SE Xetra	DE0008404005	15000	500000	42174
MUENCH. RUECK N Xetra	DE0008430026	15000	500000	36181
BAYER N AG Xetra	DE000BAY0017	15000	500000	61421
E.ON AG NA Xetra	DE000ENAG999	15000	500000	92194
BBVA Bolsa de Madrid	ES0113211835	25000	500000	205683
BANCO SANTANDER Bolsa de Madrid	ES0113900J37	35000	500000	548796
IBERDROLA Bolsa de Madrid	ES0144580Y14	25000	500000	336417
REPSOL YPF Bolsa de Madrid	ES0173516115	15000	500000	68850
TELEFONICA Bolsa de Madrid	ES0178430E18	35000	500000	288139
NOKIA Helsinki SE	FI0009000681	35000	500000	233580
CREDIT AGRICOLE EN Paris	FR0000045072	7500	500000	28293
AIR LIQUIDE EN Paris	FR0000120073	7500	500000	25906
CARREFOUR EN Paris	FR0000120172	7500	500000	30592
TOTAL EN Paris	FR0000120271	7500	500000	45159
L OREAL EN Paris	FR0000120321	7500	500000	27582
SANOFI-AVENTIS EN Paris	FR0000120578	7500	500000	41037
AXA EN Paris	FR0000120628	7500	500000	35222
DANONE EN Paris	FR0000120644	7500	500000	30536
L.V.M.H. EN Paris	FR0000121014	7500	500000	29786
SCHNEIDER ELECTR EN Paris	FR0000121972	7500	500000	27420
UNIBAIL RODAMCO EN Paris	FR0000124711	7500	500000	41467
SAINT-GOBAIN EN Paris	FR0000125007	7500	500000	25433
VINCI EN Paris	FR0000125486	15000	500000	24087
VIVENDI EN Paris	FR0000127771	7500	500000	41563
SOCIETE GENERALE EN Paris	FR0000130809	7500	500000	29430
BNP PARIBAS EN Paris	FR0000131104	7500	500000	36329
FRANCE TELECOM EN Paris	FR0000133308	7500	500000	62633
GDF SUEZ EN Paris	FR0010208488	7500	500000	32260
ALSTOM EN Paris	FR0010220475	7500	500000	22512
CRH PLC Irland SE	IE0001827041	15000	500000	24379
GENERALI ASS Borsa Italiana	IT0000062072	15000	500000	90699
UNICREDIT Borsa Italiana	IT0000064854	15000	500000	723509
INTESA SANPAOLO Borsa Italiana	IT0000072618	15000	500000	217375
ENEL Borsa Italiana	IT0003128367	15000	500000	204020
ENI Borsa Italiana	IT0003132476	25000	500000	398753
TELECOM ITALIA Borsa Italiana	IT0003497168	7500	500000	113076
ARCELORMITTAL EN Amsterdam	LU0323134006	15000	500000	47695
UNILEVER CERT EN Amsterdam	NL0000009355	15000	500000	57049
PHILIPS KON EN Amsterdam	NL0000009538	15000	500000	39133
ING GROEP EN Amsterdam	NL0000303600	15000	500000	36501
AEGON EN Amsterdam	NL0000303709	7500	500000	24828

Source: Chair of e-Finance, Goethe University, Celent

Table 6: Tables of Parameters SMS, LIS, and ANOMIS

Name	ISIN	SMS	LIS	ANOMIS
D'IETEREN EN Brussels	BE0003669802	7500	250000	9556
BEFIMMO-SICAFI EN Brussels	BE0003678894	7500	250000	9439
ElringKlinger AG Namens-Aktien o.N. Xetra	DE0007856023	7500	250000	7424
CONSTRUCCION Y AUXILIAR DE FERROCARRILES, S.A., ACCIONES Bolsa de Madrid	ES0121975017	7500	250000	15801
SOL MELIA, S.A., ACCIONES POR DESDOBLAMIENTO Bolsa de Madrid	ES0176252718	7500	250000	13165
Kemira Oyj Helsinki SE	FI0009004824	7500	250000	11445
Cargotec Oyj Helsinki SE	FI0009013429	7500	250000	9889
VICAT EN Paris	FR0000031775	7500	250000	7353
FAURECIA EN Paris	FR0000121147	7500	250000	6867
CREDITO VALTELLINESE Borsa Italiana	IT0000064516	7500	250000	12016
HERA Borsa Italiana	IT0001250932	7500	250000	8761
SLIGRO FOOD GROUP EN Amsterdam	NL0000817179	7500	250000	8077
MEDIQ EN Amsterdam	NL0009103530	7500	100000	7530

Source: Chair of e-Finance, Goethe University, Celent

Market Manipulation Strategies

The emergence of multiple trading venues in the cash equity market has made some market manipulation tactics much more efficient and difficult to detect, especially when market surveillance activities are not centralized but conducted at a national and trading venue level. The case in the European cash equity market is even more difficult, with heterogeneity of the regulatory regime applying to the various trading venues from MiFID for exchanges, MTFs, and SI to investment firms regulation for crossing network and OTC market. Three main types of market manipulation could have benefited from the emergence of competition in European cash equity: painting the tape; placing order with no intention to execute them; and pump and dump / trash and cash.

Painting the Tape

Painting the tape is an illegal action by a group of market manipulators buying or selling a security among themselves to create artificial trading activity, which, when reported on the ticker tape, lures in unsuspecting investors as they perceive an unusual volume. After causing a movement in the security, the manipulators hope to sell at a profit. Another way is to break down larger orders into more numerous smaller orders to have more trades appear on the tape and attract investor interest.

Detection is difficult due to involvement of a number of traders. It will need complex software systems with memory (of which accounts have been involved in trading for which securities) and some form of artificial intelligence (to detect trends present of buying and selling among a group of traders) to be able to detect painting the tape.

The presence of multiple trading venues introduces the difficulty (due to the best execution rule) of ensuring that the buy order of one trader and the sell order of another trader are entered into the same venue. Here too, if brokers are in collusion with the traders, the brokers can enter the orders in the venues of their choice. If the group of brokers conduct every single trade in a different trading venue (or very few trades in each venue), it will become more difficult for each venue to independently detect such action since no proper trend of trading among a group of traders can be found. (Detection of a trend requires a minimum number of trades at a single venue.) Detection of such manipulation will require an automated system to run across all venues.

Another type of painting the tape technique includes colluding in the after market of an initial public offer. This practice is particularly associated with IPO of securities immediately after trading in the security begins. Parties which have been allocated stock in the primary offering collude to purchase further tranches of stock when trading begins in order to force the price of the security to an artificial level and generate interest from other investors—at which point they sell their holdings.

Placing Orders with No Intention of Executing Them

This involves the entering of orders, especially into electronic trading systems, which are higher/lower than the previous bid/offer. The intention is not to execute the order but to give a misleading impression that there is demand for or supply of the financial instrument at that price. The orders are then withdrawn from the market before they are executed. (A variant on this type of market manipulation is to place a small order to move the bid/offer price of the financial instrument and being prepared for that order to be executed if it cannot be withdrawn in time.)

Such manipulation is extremely difficult to detect. The difficulty in detection is not due to the level of technology or logic involved but rather due to the difficulty in exactly defining what exactly constitutes such orders. Any trader accused of placing orders with no intention of executing them can easily defend himself by saying that he had honestly entered such orders and that it is not his fault that they didn't get executed—and it is difficult to prove otherwise. Detection may be possible if:

- A significant number of such bid/asks come from same account/accounts with same beneficiaries for the same stocks, and/or
- There is a significant price difference between the bid/offer prices of these orders and the prevailing market prices

Multiple trading venues make detection even more difficult because a trader can spread his bid/asks over venues. With just a single such order or very few orders at a single venue, it is almost impossible to detect them.

Pump and Dump

This practice involves taking a long position in a security and then undertaking further buying activity and/or disseminating misleading positive information about a security with a view to increasing its price. Other market participants are misled by the resulting effect on price and are attracted into purchasing the security. The manipulator then sells out at the inflated price “Trash and cash” is the opposite of pump and dump. A party will take a short position in a security, and undertake further selling activity and/or spread misleading negative information about the security with the purpose of driving down its price. The manipulator then closes his position after the price has fallen.

The detection of pump and dump and trash and cash is difficult since:

- They happen over a long period of time (not one trade or just a few trades on a single day).
- The dissemination of false information is not something that automated systems running on trading venues can detect. Such information can be detected and traced by much more sophisticated and costlier systems usually reserved for electronic surveillance activities of government security agencies.

- There is no set rule/logic to executing pump and dump / trash and cash strategy. It is more plan as you go, and hence more difficult to detect (e.g., wash trade has a set logic of two orders at the same price/quantity/time and can be detected by the presence of such logic).

Multiple platforms will make detection of pump and dump and trash and cash more difficult to detect. Since the aim of this manipulation is to influence prices over a relatively longer period of time, isolated trades in various trading venues (couples with misleading information) can do the trick. There is no need to have multiple trades in one venue to influence the price. This makes real time detection of such manipulation virtually impossible. These might be detected later with the help of a combination of automated systems and manual investigation.

Leveraging Celent's Expertise

If you found this report valuable, you might consider engaging with Celent for custom analysis and research. Our collective experience and the knowledge we gained while working on this report can help you streamline the creation, refinement, or execution of your strategies.

Support for Carriers

Typical projects we support related to MiFID include:

Vendor shortlisting and selection. We perform discovery specific to you and your business to better understand your unique needs. We then create and administer a custom RFI to selected vendors to assist you in making rapid and accurate vendor choices.

Business practice evaluations. We spend time evaluating your business processes, particularly in [list several here]. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

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We provide services that help you refine your product and service offerings. Examples include:

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Market messaging and collateral review. Based on our extensive experience with your potential clients, we assess your marketing and sales materials—including your website and any collateral.

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Capital Market 2.0: The Future of Institutional Brokerage and Market Making Operations
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Online Brokerage: Trends and Development
February 2009

Commodity Exchanges: Consolidation, Drivers and Implication
February 2009

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Author Biographies

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Prof. Dr. Peter Gomber holds the Chair of Business Administration, especially e-Finance at the Faculty of Economics and Business Administration, University of Frankfurt/M., Germany since December 2004. He is Vice Chairman of the E-Finance Lab, an industry-academic partnership between Frankfurt and Darmstadt Universities and ten leading industry partners (e.g., Deutsche Bank, Deutsche Börse, IBM, DZ Bank). The E-Finance Lab employs nine professors and more than 30 Research Assistants.

Prof. Gomber's academic work focuses on market microstructure theory, regulatory impact on financial markets, institutional equity trading, and innovative concepts/technologies for electronic exchange trading systems. Prof. Gomber is an Associate Editor of the "Journal of Trading" and of the "International Journal of Electronic Banking."

He published several articles on the above topics in international journals and was awarded with the Reuters Innovation Award 2000, the University Award of DAI 1999, and Best Paper Awards of international conferences. In May 2007 he was awarded the IBM Shared University Research Grant.

Before joining the University of Frankfurt, he worked for five years as a Director, Head of Market Development Cash Markets and Xetra Research at Deutsche Börse AG, Frankfurt. There he developed new market models for cash market trading on Xetra. Furthermore, he headed strategic and regulatory projects and was responsible for the provision of Xetra and Eurex Backend Insourcing and Technology Sales Services to international exchanges.

Prof. Dr. Gomber graduated in Business Administration and acquired his PhD at the Institute of Information Systems at the University of Gießen, Germany. In addition, he has worked as an independent consultant to international exchange operators and software houses.

Axel Pierron

Axel Pierron, based in the firm's Paris office, is a Senior Vice President for Celent's European research group. Mr. Pierron's expertise lies in electronic equity and bond trading, derivatives and FX markets, market infrastructure, and trade finance.

Mr. Pierron is quoted regularly in the media, including the *Financial Times*, Reuters, *Les Echos*, *Le Monde*, CNBC, BBC, Financial News, France 2, *Daily Telegraph*, and *European Banker*. He is a frequent speaker on technology's impact on strategy and market organization. Mr. Pierron was a member of the Mission Ecoter within the French Senate and of the Association pour le commerce et les services en ligne (ACSEL).

Before joining Celent, Mr. Pierron was an Internet research analyst for BNP Paribas, where he conducted a variety of market research and projects in fields such as e-finance, global B2B operations, knowledge management, and CRM. He was a member of several strategic Internet units within BNP Paribas, including those focused on financial markets.

Previously, Mr. Pierron was an internal auditor for Leclerc, the second largest super-market chain in France. His duties there included management of an EDI implementation project.

Mr. Pierron holds an MA in financial markets from the CERAM business school in Nice, France. He is fluent in English and French and proficient in German.

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