

The impact on financial market liquidity of the markets in financial instruments directive (MiFID)

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The Markets in Financial Instruments Directive (MiFID), which entered into force on 1 November 2007, implies the abolition of the concentration rule regarding equity transactions so far in force in France. This rule, which was applied to varying degrees across Europe, resulted in the vast majority of order flow being concentrated in regulated markets, and notably in Euronext Paris for shares listed on the French stock exchange.

Over the coming years, order flow will become fragmented de facto as a result of being able to execute client orders on regulated markets as well as on multilateral trading facilities (MTFs), and by use of systematic internalisers (SIs), which act as counterparties for transactions in the same way as market makers on price-driven markets such as the London Stock Exchange (LSE) or Nasdaq.

The competition between trading venues, which will be enhanced at the European level, has steadily been increasing since the 1970s. Since then, alternating series of regulations and technological progress have gradually weakened the monopolistic position of national regulated markets. The impact of this phenomenon has been a continuous fall in transaction costs, benefiting investors and issuers of securities through a drop in the cost of capital. However, the fragmentation of order flow stemming from a proliferation of trading venues may raise concern about a reduction in market liquidity and a slowdown in the decline in transaction costs, which would run counter to the competitive effect between systems sought by the European regulatory authorities.

Although the most conservative medium-term scenarios point to continued dominance by regulated markets, we estimate that in the case of France, a very significant share of order flow may rapidly be executed on alternative trading systems. Here, we focus on the impact on “wholesale” transactions, i.e. transactions of at least EUR 50,000, which we attribute to institutional investors. In particular, we identify the portion of these trades currently executed outside the order book. According to our estimates, these transactions constitute roughly 10% of the traded volume on CAC 40 shares and that may be lost to the regulated market each year. This volume, which would more or less equally be distributed between SIs and MTFs operating crossing systems, only constitutes a fraction of the total volume of the wholesale market.

The article is organised as follows. Section 1 presents the main drivers for competition between stock markets over the past 30 to 40 years. It describes in greater detail what constitutes the major issue over the coming years in terms of opening up to competition in Europe, i.e. MiFID, and addresses the economic implications of the new regulations. Section 2 proposes, for the most liquid shares on Euronext Paris, a preliminary estimate of wholesale order flow, i.e. block trades, which do not contribute to the price discovery process as they are currently executed outside the order book, and which could be executed on alternative trading facilities in the medium term.

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1 | DEVELOPMENT OF COMPETITION BETWEEN TRADING VENUES

1|1 Developments since the 1970s

Competition between stock markets has been increasing since the 1970s as a result of deregulation and technological progress, which have alternated in an almost cyclical fashion.

Initially, the regulatory authorities gave the necessary impetus to the opening-up and development of competition in securities trading, both in terms of the stock markets themselves, which generally were originally state-owned monopolies, and the intermediaries (brokers, banks, etc.).

In the United States, the deregulation of financial markets began in 1975 with the elimination of fixed commissions on stock market transactions, while this shift occurred later in Europe. The London Stock Exchange implemented the same type of reform in 1986 (the "Big Bang"), followed by the *Société des Bourses françaises* in 1989. In Europe as a whole, the 1993 European Investment Services Directive definitively placed trading activities in a competitive framework by putting professionals in charge of the functioning of markets.

Changes in the activities of traditional stock markets and, to a certain extent, the opening-up of foreign markets, have also fostered competition:

- Traditional stock markets have seen their role confined to providing price discovery, which is a role open to strong competition. The dematerialisation of securities (in France, the process, initiated in the late 1970s, became effective in 1984) considerably reduced the role of institutions that had controlled the whole chain of securities transactions from listing to clearing and settlement.
- The economic environment enabled investors and issuers to access foreign markets and to

develop trade-off between equity markets. With the lifting of foreign exchange and price controls in the 1970s and 1980s, investors, particularly institutional investors, were able to broaden their international portfolios, while in Europe, the introduction of the euro made easier comparisons between companies in different countries. These two factors had a positive impact on competition between stock markets that had previously mainly served a domestic market.

The opening-up to competition led to major innovations in the sector and the emergence of players making use of new technologies. Stock exchanges sought to streamline their functioning, in most cases opting for electronic systems, which are less costly, substantially reduce human intervention, increase the capacity for processing orders and decentralise transactions, thus removing the need for physical presence in a dedicated building (closure of the Paris stock market's Palais Brongniart in 1998 after the Matif's switch to electronic trading).¹

Today, the United States is virtually the only place where trading floors still exist (NYSE, CBOE, CME, etc.). The development of electronic systems on the securities trading layer was also reinforced by the arrival of new players in the form of alternative trading systems (ATSSs), including electronic communication networks (ECNs), which heightened competition among regulated markets.

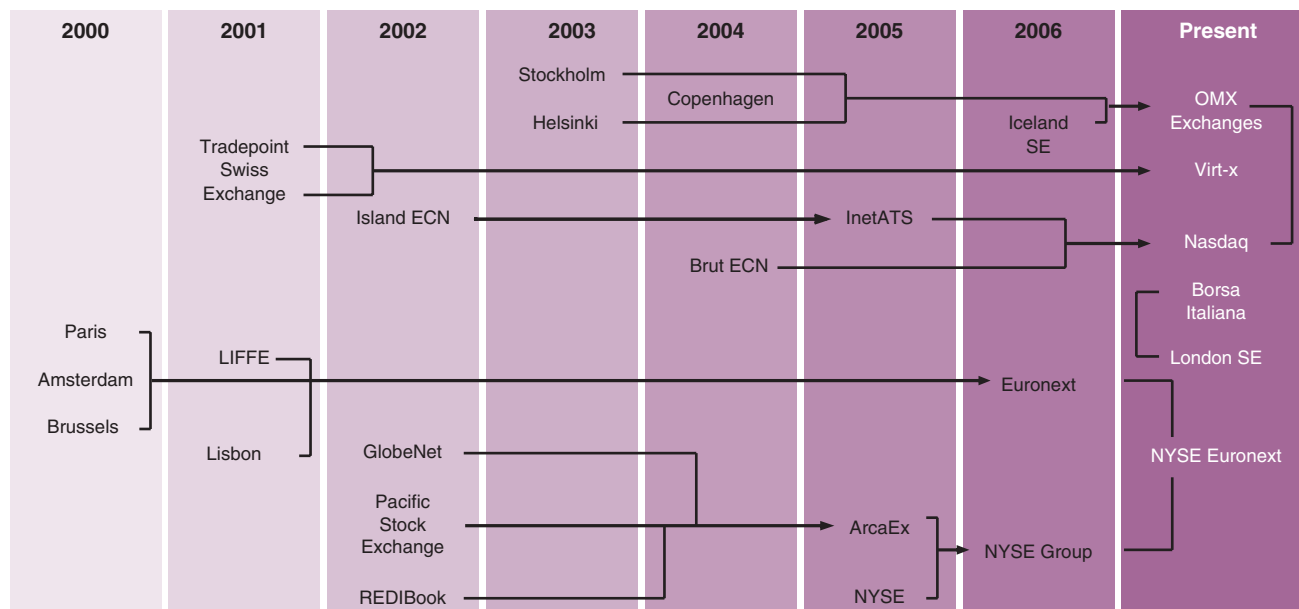
In order to obtain the necessary financing from private agents to develop electronic trading systems,² stock exchanges changed their capital structure, first *via* "demutualisation", thus opening up their capital, initially held by their own members, and second, by becoming profit-making companies, a number of these exchanges were listed on their own exchanges, enabling them to further diversify their holding structures. In 2001, the leading European stock exchanges (Euronext, Deutsche Börse, LSE) were listed on their own Bourse. This trend has continued elsewhere, with the NYSE going public in March 2006 and plans to go public by the Borsa Italiana and Bolsas y Mercados Españoles (BME). According to IOSCO,³ at the end of 2005, 16 stock exchanges

1 In France, the CAC was launched in 1986 along the lines of the Canadian CATS system set up in the 1970s. Generally speaking, electronic systems were introduced in the mid-1990s (1995 in the case of Peru and India, 1996 for Mexico, South Africa, Luxembourg, Malta and Switzerland, 1997 for Germany, Brazil, Israel, 1998 for Hungary, 1999 for Austria, Tokyo, etc.).

2 The London Stock Exchange and Deutsche Börse both spent over USD 100 million to implement their respective electronic systems, Sets and Xetra (see Domowitz and Steil, 1999).

3 IOSCO Consultation Report: "Regulatory issues arising from exchange evolution", March 2006. The International Organisation of Securities Commissions (IOSCO) brings together the market regulators of 27 countries.

Figure 1
Main operations since 2000



or exchange holding companies (both in the cash and derivatives markets) were listed.

IPOs have also facilitated mergers between stock exchanges (see Figure 1). Mergers and partnerships sharply increased over the past two years and, following pan-European consolidation (Euronext, OMX), they are now taking place between US and European exchanges (NYSE-Euronext, Nasdaq-OMX), leading to stakes being taken by Middle-Eastern investors and stock exchanges (Borse Dubai and Qatar Investment Authority became stakeholders of the LSE). US regulations (Reg NMS, Sarbanes-Oxley, etc.) play a key role in the US regulated markets' pursuit of critical mass and acquisition of new exchanges.

1|2 The Markets in Financial Instruments Directive (MiFID)

In Europe, until the application of MiFID in November 2007, the concentration rule, stipulated in the Investment Services Directive (ISD 93/22/EEC), limited *de facto* competition in the securities trading layer. The rule requires that all equity transactions

be carried out on a European regulated market (in practice usually the regulated market of the country concerned).⁴

Several Member States (including France, Germany, Spain, Italy and Belgium) have adopted this rule, with various exemptions. In the UK, where the rule was not applied, the regulated market competed both with banks, which execute a certain amount of transactions internally, and with ECNs such as the electronic trading system Virt-x. In Germany, the concentration rule was applied, while retaining the option allowing investors to opt out.

In spite of this rule, generally speaking, regulated domestic markets remain the only listing venue for domestic firms, and investors trade mostly on these markets, notably owing to matters related to language, information access and transaction costs.

In some cases, traditional stock exchanges' position of monopoly or virtual monopoly at the national level has resulted in excessively high fees, both for issuers and investors. Noteworthy examples are the LSE, which was forced by the UK Office of Fair Trading to bring down annual fees charged to issuers by 25%, and Euronext Amsterdam, which reduced

⁴ In this case, the following criteria must be met: the investor must be habitually resident or established in that Member State; the investment firm must carry out such transactions through a main establishment, through a branch situated in that Member State or under the freedom to provide services in that Member State; and the transaction must involve an instrument dealt in on a regulated market in that Member State (Article 14, Council Directive 93/22/EEC of 10 May 1993).

trading fees by 30% in response to the launch of the new competitor Dutch Trading Services.

The situation is likely to change with the application of MiFID, leading to the abolition of the concentration rule and increased competition among regulated markets and other alternative facilities.

MTFs are the alternative facilities which organise the multilateral matching of third-party buying and selling interests like most regulated markets. MiFID also recognises "systematic internalisation", meaning that investment firms act as intermediaries executing orders they receive from clients against their own book or against orders from other clients. By publishing continuous firm quotes for some equities, and the size at which it quotes, the bank sells/buys the securities when one of its clients sends a buy/sell order.

The future regulation establishes an overall operating framework ensuring the smooth functioning of the market and enhancing investor protection. In particular, it sets out a number of rules providing obligations in terms of transparency and quality of order execution:

- The "best execution" principle is defined as the obligation for intermediaries to make reasonable efforts to obtain the best possible result for their clients when executing orders. MiFID introduces a "multi-criteria" approach towards order execution conditions, defining the key aspects that the investment firm (IF) must take into account to ensure that they may obtain such a result, be it price, costs, speed and likelihood of execution and settlement, size, nature of the order or any other factor related to the execution of the order.⁵ In contrast, when the investment firm executes an order on behalf of a retail client, the best possible result is simply determined on the basis of the total costs.⁶ The latter mainly concerns SIs.

- Pre-trade transparency obligations require that regulated markets and MTFs publish quotes for listed

securities, on a continuous basis, during normal trading hours. SIs are subject to this rule only for "liquid"⁷ securities of below "standard market size".⁸ Post-trade transparency obligations require that all these market players publish transaction information (price, volume, time) after execution.

In comparison with the system in place in the United States (see Appendix 1), European regulation provides a stricter framework aimed at limiting the development of private trading systems described as opaque in the United States, or "dark pools of liquidity", which may erode liquidity on regulated markets and lead to a duality of investor classes. In particular, US pre-trade transparency obligations do not apply across the board, since the rule that requires an electronic system to publish a quote if it exceeds 5% of the traded volume in a security has been subject to exemptions (Liquidnet was granted an exemption).

Moreover, MiFID's best execution requirements are based on the rules gradually implemented on the NYSE in 1981 (the "trade-through rule") and on Nasdaq in 1997 (the order handling rule). However, the European regulation has the advantage of taking account of the transaction's various components. As it is limited to the price criterion, its counterpart in the new US regulation, Reg NMS (an extension of the trade-through rule) makes reconciling the needs of retail and institutional investors difficult. The latter will naturally seek to prevent their large orders from being executed against those of small investors (which would have an unfavourable impact on prices) by using dark pools of liquidity.

In theory, the "opacity" of these new systems affects the price discovery process, which no longer includes transaction data captured by these systems. Nevertheless, the use of algorithmic trading, which enables investors to track several trading systems around the clock, may limit the effects of fragmentation, although such strategies are not accessible to all investors.

⁵ Article 21 of Directive 2004/39/EC of 21 April 2004.

⁶ Article 44 of Directive 2006/73/EC of 10 August 2006.

⁷ A share admitted to trading on a regulated market shall be considered to have a liquid market if the share is traded daily, with a free float of not less than EUR 500 million, and if one of the following conditions is satisfied: the average daily number of transactions in the share is not less than 500; the average daily turnover for the share is not less than EUR 2 million (see Article 22 of Commission Regulation (EC) No. 1287/2006).

⁸ This threshold depends on the average value of orders executed (see Article 23 of Commission Regulation (EC) No. 1287/2006).

1|3 The economic implications of the new regulations

Financial market trends have implications beyond the financial sector alone, insofar as an improvement in price discovery or an increase in competition in this sector would lead to a reduction in the cost of capital for listed firms. The latter could be achieved directly, *via* a reduction in transaction costs, which increases the net gains expected by the investors buying the securities. Thus, all things being equal, these investors would have to do with lower gross return. A decrease in the cost of capital may also result from a reduction of barriers to cross-border investment (decrease in the "home bias" leading to an improved diversification of investments).

Economic gains stemming from a decrease in transaction costs may be substantial. Taking into account the current degree of automation of trading systems in Europe, Domowitz and Steil (2002) demonstrate that transaction costs could drop by 50% in the euro area (thanks to a reduction in explicit costs alone) which, taking account of the elasticity of the cost of capital, would make it possible to reduce the cost of capital for companies by almost 8%. For France alone, a 10% decline in the cost of capital (*i.e.* around 80 basis points) would, according to the Treasury and Economic Policy General Directorate's (DGTPE) *Mésange* model, result in a 0.3% rise in GDP at the five year horizon, meaning that the economic impact would be significant.⁹

"Explicit" transaction costs can be estimated from the investor's point of view by calculating the overall direct transaction costs buying or selling a security. These costs depend particularly on the organisation of the market, as well as on competition among IFs, which is contingent on how restrictive regulations are, and on taxation. In Paris, these costs can be obtained by referring to the advice of execution following each transaction, which lists the commission fees, VAT and stamp duty.

In addition to these expenses, *indirect costs* are related to the order execution conditions. These costs, known as "*implicit*", are less easy to estimate

and reflect market "liquidity".¹⁰ In practice, at least two components must be taken into account:¹¹ the difference between an asset's ask price and its bid price (the liquidity provider is compensated and earns income through the "*bid-ask spread*") and the transaction's impact on prices (the larger the order and the shallower the market, the greater the transaction's impact on prices).

The overall impact of the new regulations (e.g. Reg NMS and MiFID) on transaction costs introducing competition among the different trading venues remains uncertain, as numerous mechanisms may be involved and may affect the market quality:

- *By introducing competition among the different players, order flow fragmentation could lead to downward pressure on both direct and indirect transaction costs. Competition among liquidity providers leads to competition for the provision of best bid and best ask prices, while competition among the various trading venues reduces the monopoly rent which comprises, among other, access fees, and encourages the trading systems to innovate in order to reduce costs (Hamilton, 1979). An improvement in liquidity was indeed observed following the setting up of dual listing both on the London and Paris stock exchanges (traded on London's SEAQI) at the beginning of the 1990s of the most liquid shares on the French Bourse (Hamet, 1998).*

However, *order flow fragmentation between several trading systems should in theory mechanically result in reduced liquidity* in the original market. According to the age-old rule "liquidity begets liquidity", order flow consolidation should improve market quality whereas the opposite is true of order flow fragmentation. The coexistence of several competing markets is not viable; since investors are attracted to the most liquid market, the other markets should eventually close (Mendelson, 1987). Although this conclusion remains highly theoretical, and does not take into account a number of opposite effects discussed in this section, it does not detract from the fact that the internalisation of part of the order flow has a negative impact on liquidity if these orders no longer participate in the process of price discovery.

⁹ For an assessment of the impact at the European level, see the report ordered by the European Commission (2002): "Quantification of the macro-economic impact of integration of EU financial markets", London Economics.

¹⁰ For a more detailed explanation of market liquidity, see Bervas (2006).

¹¹ Ideally, the time factor should be taken into account (speed of order execution), though the most measures available at present only include the two factors mentioned above.

• The coexistence of several competing trading systems, with distinctive operational characteristics, should *help to fulfil the heterogeneous needs of the various types of investors* (in terms of cost, execution times, order size, etc.). The coexistence of several markets is therefore theoretically possible if the most liquid market is also the most expensive, thus attracting the largest market players, as is the case for the block trading market (see Pagano, 1989). The heterogeneity of investor preferences is confirmed by the Institutional Investor's annual survey of traders working in fund management companies.¹²

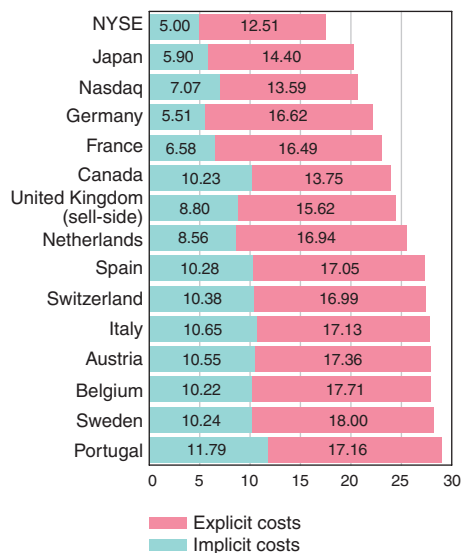
Conversely, *order leakage could cause market quality to deteriorate*. This would notably be the case if SIs skewed the nature of order flow by attracting "uninformed" clients on whom they make a profit ("cream skimming"). In theory, uninformed investors are indispensable to the price discovery process. To remove such investors from the main market would lead to a deterioration of market quality, with liquidity providers widening quoted bid-ask spreads when they find better-informed agents.¹³ This would have an impact on internalised orders which would in turn be more expensive as they are based on market prices.

Beyond these general arguments, it must be borne in mind that the effects of order flow fragmentation can differ greatly according to the security being dealt. An asset's initial liquidity (in terms of traded volume, bid-ask spread, etc.) is a key factor. According to Bennett and Wei (2006), the less liquid the security, the greater the impact of increased fragmentation on the volatility of a security's price and the transaction costs.

The Elkins-McSherry analysis of equity transaction costs confirms how difficult it is to anticipate the impact of regulations. During the period from June 2005 to July 2006, stocks listed on the NYSE, on the Nasdaq and the Japanese stock exchanges recorded the lowest transaction costs, with France in fifth position behind Germany. The UK ranks seventh if the sell side of transactions alone is taken into consideration.¹⁴

Figure 2
Breakdown of average transaction costs between July 2005 and June 2006

(in basis points)



Source: Elkins-McSherry

In the case of Germany, fragmentation seems to have resulted in a low market impact and high commission fees, contrary to certain theories previously highlighted in this paper. Competition is established in Germany both within the regulated Deutsche Börse's dual system (where the electronic system Xetra¹⁵ competes with the floor trading of the Frankfurt Stock Exchange), between the main regulated market and the seven small regional stock markets (Düsseldorf, Munich, Hamburg, Hanover, Stuttgart, Berlin and Bremen), and due to the option to opt out of the concentration rule (this option allows 50% of traded volume to be executed outside the regulated market).

All in all, *Germany is well-positioned in terms of liquidity, which seems to indicate that fragmentation has not caused market quality to deteriorate.*¹⁶ In contrast, *Germany has relatively high direct costs (16.24 bp) while the vertical structure of the Deutsche Börse, which also controls clearing and settlement, should enable significant economies of scope to be achieved.*

¹² Elkins-McSherry ranks securities trading systems according to the overall quality of order execution services. It appears that institutional investors prefer electronic systems to traditional stock exchanges. Traditional stock exchanges (Nasdaq and NYSE) rank last, behind electronic systems (ECNs and crossing networks).

¹³ This is referred to as the "adverse selection component of the bid/ask spread" (see Kyle, 1985).

¹⁴ Stamp duty is systematically charged on acquisitions, which brings the fees component to 49.91 bp, compared to 0.52 bp for sales. As a result, in reality, the UK stock market ranks far below the other leading stock markets.

¹⁵ Xetra has a market share of between 92% and 97% of transaction volumes on the DAX and the MDAX, see Factbook 2005, Deutsche Börse AG, p49.

¹⁶ Another explanatory factor appears to be the very small tick size (EUR 0.001 for securities of between EUR 0.001 and 0.249 and EUR 0.01 for securities of over EUR 0.25).

2| EMPIRICAL ESTIMATE OF POST-MiFID ORDER FLOW FRAGMENTATION

2|1 The post-MiFID landscape is difficult to predict

It is difficult to form a clear picture of the European stock market landscape in the medium term (three to five years). A number of major potential scenarios emerge, but no single hypothesis dominates. For instance, although the current models are fairly heterogeneous in Europe, notably due to the differences in the application of the concentration rule (see Section 1|2), regulated markets predominate in terms of market share thanks, most often, to the efficiency of fully automated systems. Contrary to what has been observed in the US since the early 1990s with the launch of Electronic computer networks (ECNs), competition based solely on new technology would therefore not be possible.

In Europe, due to the technological advantage of regulated markets, the conservative assumption whereby they will continue to predominate is the most commonly held. Investors are not willing to use other trading systems that do not appear to benefit from the same liquidity pool that characterises traditional stock exchanges, even some MTFs would offer an innovative organisation of the transactions. Moreover, in countries applying the concentration rule, intermediaries report all transactions to the regulated domestic market, which sends the information to the regulatory authorities. Following the implementation of MiFID, since IFs will be directly responsible for reporting transactions, it might be easier for them to continue executing clients' orders on the regulated market, which already proposes the infrastructures to report to the competent authorities and would be responsible for reporting obligations.

The ongoing consolidation observed over recent years within Europe, as well as between European and US stock markets, should enable regulated markets to offer an increasingly deeper liquidity pool

to investors and benefit from advantages related to economies of scale. These markets would therefore be in a position to maintain their domination.

However, the launch or the announcement in recent months of the creation of a certain number of alternative trading systems, meaning post-MiFID MTFs, heralds a more fragmented European stock market landscape.

A number of these new systems differ relatively little to those offered by the regulated markets, as they are based on an automated order book; competition will therefore depend on speed and/or cost criteria. This is the case for Chi-X, launched by Instinet, which is already active in countries that do not apply the concentration rule, and which should, in November 2007, propose a central limit order book (CLOB) for 7,500 pan-European securities. Likewise, Equiduct, primarily owned by Börse Berlin, is based on an up-to-date version of the defunct trading platform Easdaq, with a hybrid order book filled up by market makers and limit order providers. Project Turquoise, launched by seven major investment banks, including Merrill Lynch and Goldman Sachs, should be an alternative trading platform for European equities.¹⁷

Other competitors are expected to attract institutional investors, which execute transactions involving a large number of securities and for which the major criterion is to obtain a sufficiently large counterparty without revealing their position to the other market players. These systems are expected to develop along the same lines as dark pools of liquidity in the United States, *i.e.* electronic platforms that seek to match buy and sell orders anonymously, without displaying the orders publicly. Nevertheless the MiFID transparency requirements would bound their opacity. These private trading systems, organised outside the regulated markets, are mainly targeting buy-side investors,¹⁸ and less frequently sell-side players.¹⁹ Often organised as crossing systems, their originality in terms of "natural" counterparty searching methods could benefit institutional investors.

The largest project announced to date is that of ITG with its Posit Now platform, launched in February 2007. As of 1 November 2007, in the same vein as its US counterpart, it will offer fund managers

¹⁷ The system's launch, initially scheduled for end-2007, has nonetheless been postponed to the second quarter of 2008.

¹⁸ The buy-side includes all investors, *i.e.* institutional investors (pension funds, investment funds, insurance companies, etc.) and retail investors.

¹⁹ The sell-side includes intermediaries, which act on behalf of investors. These include investment companies (brokers), stock exchanges, market makers, exchanges members, etc.

continuous intraday crossing and total anonymity, on 9,000 securities in 15 countries. Posit Now will compete with Liquidnet Europe, which only focuses on the buy-side for block trades and covers 18 countries.²⁰

The emergence of SIs is more uncertain, on account of the demanding requirements associated to this status (regulatory capital, information disclosure rules, operating mode, etc). IFs must weigh up the cost of developing an SI activity against the income generated. Only the largest banks will be able to reach the critical mass allowing them to earn the bid/ask spread at a lower cost, while others could target certain listed securities or certain types of investors offering greater potential gains. For instance, a number of players are likely to specialise in wholesale clients as, according to MiFID, pre-trade transparency rules will not apply to SIs for the trading of the most liquid shares identified by the directive,²¹ while others will offer systematic internalisation for the other "illiquid" securities for the same reason.

As a result, it is difficult to assess the impact of MiFID, particularly since certain markets are likely to be less affected as they are already facing competition. Conversely, France exercised so far considerable control over its order flow, given that virtually all of its orders had to be executed on Euronext Paris, allowing a few exceptions which nonetheless respect the requirement of reporting to Euronext.

2|2 A first estimation of fragmentation in France

Concentrating the reporting of transactions in a single venue provides a means of analysing and identifying order flow that, depending on their characteristics (size, broker identity, execution facility), may make them eligible for execution on an alternative trading system as of 1 November 2007.

Estimates of the possible fragmentation from this data are based on the observation that MiFID will primarily enable professionals, *i.e.* institutional investors, to choose the venue for the execution of their buy and sell orders. These investors represent

the largest part of trading volume, with 93% of French and foreign securities traded in France in 2006 –excluding non-residents.²² In view of the fact that individual trades usually involve considerable amounts, initiatives such as Liquidnet or Posit are exclusively aimed at large institutional investors, offering them block trading networks. This clientele is also likely to be favoured by SIs, which could directly negotiate the transaction price.

This "wholesale market" is therefore a key element for assessing the potential degree of fragmentation in the French market, particularly from the point of view of IFs and their future clients' order flow management, in compliance with best execution requirements. In order to assess the share of order flow likely to permanently migrate from the French regulated market, we propose analysing the equivalent of the wholesale market currently identifiable on Euronext Paris, *via* block trades and "cross trades" (these particular trades are called "*applications*" on Euronext Paris), which, although restricted by the quoted prices from the central order book, are potentially large (see Appendix 3). These transactions represent one type of order flow already executed outside the order book and do not enter into the price discovery process.

Our analysis is carried out on Euronext Paris market data transmitted regularly to the *Autorité des Marchés financiers* (AMF –France's Financial Markets Authority). This data, which enables the identifying of brokers for each transaction, has the advantage of recording transactions executed outside the order book, on the basis of brokers' reports, which are therefore invisible to the rest of the market at the date of transaction.

The analysis is conducted for the period from July 2005 to June 2007 and for transactions of a minimum amount of EUR 50,000, referred to as "block trades" in the rest of this article, which is the threshold that corresponds to the minimum trade size (normal block amount –NBA) for an order to be eligible for block trades for the category of least liquid securities, *i.e.* those that are traded periodically by single-price call auctions. We focus on the transaction counterparties, *i.e.* whether such trades involve two clients of the same IF or if the IF executes the transaction against its own book. The

²⁰ According to Liquidnet Europe, the system has a liquidity pool of 3.5 billion securities, and the trading volume increased by over 350% in 2006, with an average cost reduction of 21.3 bp on each trade.

²¹ See Section 1|2.

²² According to the Banque de France securities survey. Institutional investors correspond to banks, insurance companies, pension funds and UCITS.

former are likely to be directly executed on an MTF like a crossing system or routed to a platform such as Project Turquoise, owned by IFs, while the latter should directly qualify as internalised trades.

Therefore, by measuring order flow lost to a certain extent by Euronext Paris, we seek to identify orders that are likely to be executed outside the regulated market after 1 November 2007. In practice, this amount could be much greater if the block trades currently executed in the order book were taken into account.

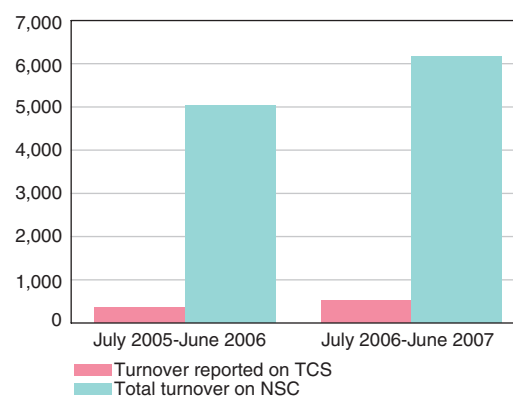
BLOCK TRADES REPORTED IN EURONEXT'S TRADE CONFIRMATION SYSTEM (TCS)

The concentration rule, which was strictly applied in France, required, until 1994, that all orders executed on the Paris stock exchange, transmitted by a broker established in France on behalf of an investor residing in France, be executed on a regulated market. However, institutional investors, discouraged by the high level of transparency that characterised the Paris Bourse, were trading executing block trades on the LSE. The Stock Exchange Automated Quotation International system (SEAQI) enabled them to trade security blocks at prices directly negotiated with the market makers in London, without revealing information to the other market players.

*The Paris stock exchange consequently took a number of steps in the mid-1990s aiming to allow block trades to be executed outside the central order book, so as to guarantee investors a certain degree of opacity.*²³ These transactions must nonetheless be reported to Euronext Paris and recorded via the TCS reporting system (see Appendix 3). Euronext's TCS is more generally used to adjust and report trades executed outside the central order book in Euronext's system.²⁴

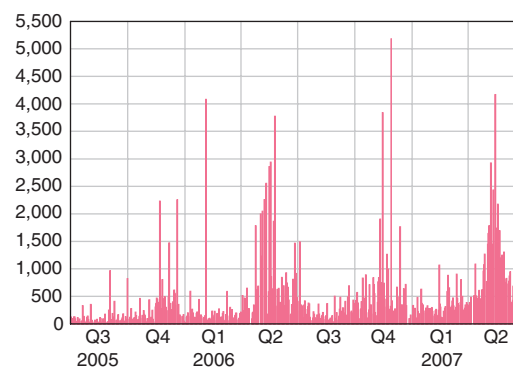
In order to assess the share of a Paris' wholesale transactions already executed outside the central order book, we analyse a limited number of transactions reported in the TCS. These transactions are classified as "block trades -out session".²⁵ To avoid taking into account small transactions executed outside trading

Figure 3
Turnover in block trades with a minimum value of EUR 50,000 reported in the TCS
Average daily turnover of Euronext Paris listed securities (EUR millions)



Turnover in block trades

(EUR millions)



Note: the average daily turnover on NSC includes turnover for trades on Euronext Paris as well as on Euronext's other stock exchanges, notably Amsterdam and Brussels. Turnover abroad is nonetheless very limited and do not significantly skew the statistics presented.

Source: SESAM database

hours in this category, only trades involving a minimum amount of EUR 50,000 are included.

The analysis for the July 2005-June 2007 period²⁶ shows that block trades represented around 8% of the total turnover (value of trades) in the central order book, with an average of 105 transactions per trading session (see Figure 3). Moreover, the block trading market is highly concentrated, both in terms of number of

²³ For a more precise definition of price and volume conditions please refer to Chapter 4 of Euronext Rule Book 1, harmonised provisions.

²⁴ See AMF Monthly Review No. 10 January 2005 (in French).

²⁵ See Euronext Cash Market - Guide to transaction reporting 2007.

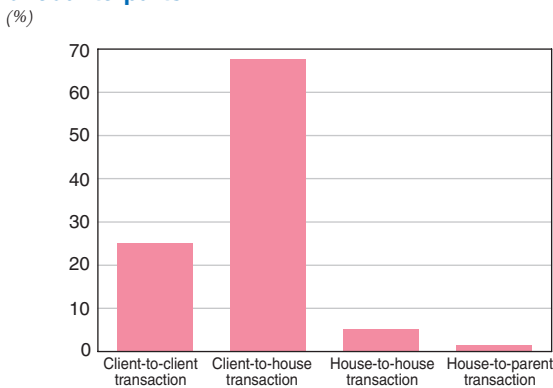
²⁶ Only transactions of over EUR 50,000 are included here. This threshold corresponds to the minimum level required for transactions on securities traded by call auctions to be eligible for block trades. The thresholds are nonetheless much higher on other securities (see Appendix 3). Reported transactions that were executed below the regulatory thresholds actually occurred outside trading hours and belong to the "out of session" category. They are also reported via Euronext Trade Confirmation System (TCS), in the same category as block trades. Furthermore, only French or foreign shares listed on Euronext Paris are included here.

securities and the number of IFs acting as broker and maybe dealer for these block trades:

- only 30 securities listed on Euronext Paris (which listed some 730 companies at end-2006) account for 80% of transactions. More generally, the 50 most traded stocks outside the market are listed on Euronext's Blue Chip large cap index, and also, in the case of 36 of them, are components of the CAC 40 index.
- 98% of transactions of over EUR 50,000 are concentrated among 25 IFs out of a total of some 90 IFs operating acting as broker-dealers for block trades over the past two years.

Block trades are executed outside the regulated market so that investors benefit from advantageous execution conditions, such as the non-disclosure of their position to the rest of the market, an advantageous transaction price and non-fragmented execution. Most often the IF is the investor's counterparty in the transaction, or else acts as a simple broker between clients. As a result, 98% of block trades of over EUR 50,000 are

Figure 4
Breakdown of block trades exceeding EUR 50,000 carried out by the same IF according to the nature of counterparts



Note : Block trades can be carried out between two clients of the same IF (client-to-client transaction) or between the client and the IF (client-to-house transaction). Less frequently, transactions are carried out internally (house-to-house transaction) or between the IF and one of its subsidiaries (house-to-parent transaction).

Source: SESAM database

carried out by the same broker on both sides of the trade. In almost 70% of cases, the IF executes orders against its own account, which means that it acts as an SI (see Figure 4). Such trades represent an average of EUR 252 million per day.

Although there are less than half as many, transactions between clients of the same IF represent an average of EUR 164 million per day. This significant order flow might migrate from the regulated market after implementation of MiFID, gravitating towards MTFs organised as crossing systems, thus enabling investors to avoid the use of a physical broker.²⁷

BLOCK TRADES EXECUTED AT MARKET PRICE OUTSIDE THE ORDER BOOK

A "cross trade" consists of the simultaneous matching and execution by the same IF of opposing buy and sell orders (see Appendix 3). By definition, cross trades are not block trades, since they are assumed to be executed at market prices. Given that they have no maximum or minimum size limit, very small transactions can be executed in the same way as transactions corresponding to equity block trades. As regards securities listed on the Paris stock exchange's benchmark index, the CAC 40, data analysed represent around 4% of total turnover on the CAC 40 executed in the central order book (see Figure 5).

Like for block trades, only cross trades with a minimum value of EUR 50,000 are analysed. In this subset, which represents 44% of all cross trades and an average of 72 transactions per day, the average transaction size is EUR 2.7 million, i.e. less than two-thirds the amount of an average block trade.²⁸

Cross trades are characterised by a very marked concentration on a limited number of securities: in turnover terms, between July 2005 and June 2007, almost 85% were carried out on 25 securities listed on the CAC 40. IFs in this sector are more highly concentrated than in the block trading market. Almost as many IFs active on the cross-trades

²⁷ However, this does not eliminate explicit transaction costs, as each investor has to pay to access the MTF.

²⁸ The average size of transactions of over EUR 50,000 recorded in TCS under "block trades - out of session" is EUR 4.48 million. For CAC 40 securities alone, the average transaction size in this category is EUR 5.5 million.

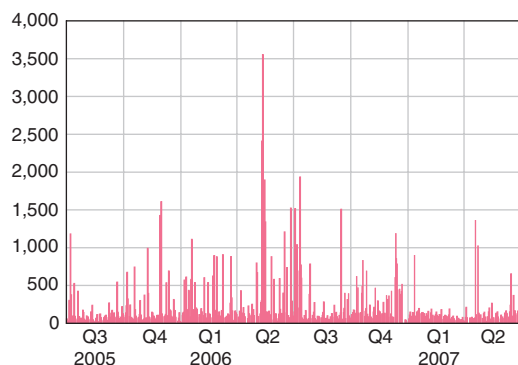
Figure 5
Cross trades on Euronext Paris on CAC40 equities
 Breakdown of average daily turnover by cross trade and in the total central order book

(EUR millions)



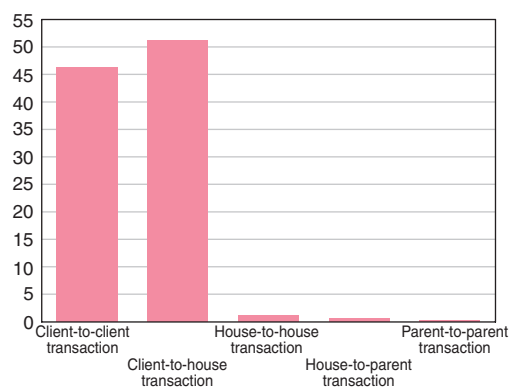
Daily turnover

(EUR millions)



Source: SESAM database

Figure 6
Breakdown of cross trades of a minimum size of EUR 50,000 according to the nature of counterpart
 (%)



Source: SESAM database

segment can be found on the block trade market. Nonetheless, over 90% of the total turnover in cross trades is handled by just 10 IFs.

Moreover, in practice, over 50% of these cross trades are executed against IFs' own accounts. As a result, like for certain block trades, these transactions are already *de facto* internalised, since the transaction price satisfies constraints of MiFID. Although the number of transactions carried out between the client and the IF for its own account is higher than that of transactions between clients, the latter has amounted to an average of EUR 97 million per day over the past two years compared to EUR 69 million for the former (see Figure 6).

A CONFIGURATION LIKELY TO RESULT IN FRAGMENTATION

Whether competitors to regulated markets emerge as of November 2007 will depend on the capacity of alternative trading systems to meet the needs of institutional investors in particular. Whether IFs decide to develop SI activities or not will depend on their achieving critical mass thanks to their retail clients and above all on volume that they will be capable of trading with institutional investors.

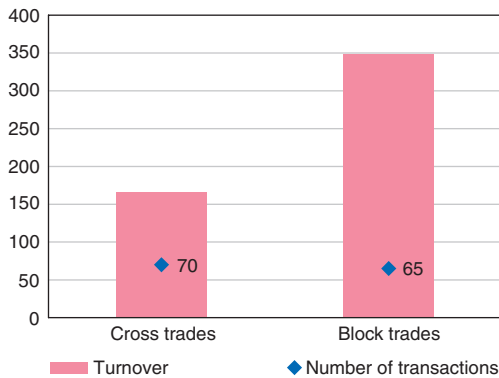
The summary of order flow observed on Euronext Paris shows that the great majority of block trades and a significant share of cross trades are on CAC 40 securities. Block trades of over EUR 50,000 executed by an IF, either as a counterparty or involving two of its clients, averaged EUR 1,285 billion per year for the July 2005-June 2007 period on CAC 40 securities alone. In comparison with Euronext's centralised system, this represents around 10% of the yearly turnover on CAC 40 securities and could be lost by the French regulated market in the medium term.

The order flow, characterised by the strong concentration of both investors and equities traded, and which currently does not participate in the price discovery process on Euronext, is therefore significant. The estimates obtained provide initial indications of the impact of the implementation of MiFID:

- The number of SIs on liquid securities listed on Euronext Paris could be between five and ten in the medium term, and represent currently 5% of per annum turnover on CAC 40 securities. Although there

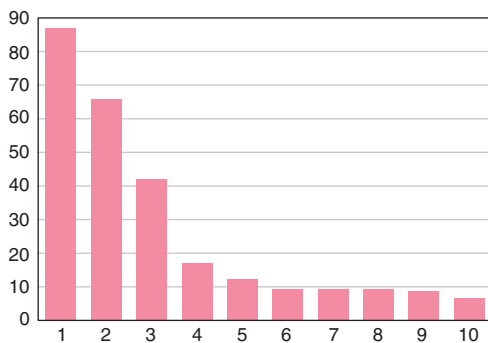
Figure 7
Summary of equity trading on the CAC 40 broken down
by cross trades and block trades of over EUR 50,000

Turnover and average number of trades per day
 (EUR millions)



Average number of trades per day by the leading IFs,
including proprietary trading

(EUR millions)



Source: SESAM database

are many IFs acting as broker-dealer between clients on CAC 40 securities (90 IFs during the period under review), only 40 of them execute trades on behalf of clients against their own book. Nonetheless, *only five of these IFs dominate the market, accounting for almost 80% of turnover.*

- Institutional investors could carry out around 6% of their annual turnover on MTFs organised as crossing systems if they decide to post their orders on a dedicated alternative system.²⁹

Finally, as this purely statistic analysis cannot give a dynamic estimate of order flow trends in a post-MiFID landscape, it constitutes an initial estimate of the volume of wholesale trades likely to be executed outside the French regulated market in the next few years. Since these trades do not participate in Euronext's price discovery process because of their current execution conditions, the impact on the regulated market's liquidity is likely to be limited.

Nevertheless, our analysis probably underestimates the volume likely to be lost by Euronext. Indeed, only a "hidden" share of the wholesale market is taken into account: block trades executed in the order book and those executed outside the order book by non-residents (not subject to reporting requirements) or by residents on another regulated market (such as SEAQI) are not included.

²⁹ For transactions reported in TCS, our statistics include only trades involving the same IF on both sides of the transaction. Two percent of the total volume is therefore not taken into account in our calculations, which may produce a slight downward bias to estimates of order flow transiting via a crossing system following the implementation of MiFID on 1 November 2007.

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APPENDIX 1

The development of financial markets in the United States

The emergence of competition in the United States is closely linked to the history of the deregulation of financial markets. In 1975, the US Congress passed amendments to the Securities Exchange Act of 1934 that sought to create a National Market System (NMS) which, through the Intermarket Trading System (ITS) linked the different stock exchanges and allowed investors to execute in theory their orders on the market providing the best quotes.¹

The structure of US equity market at that time consisted of a main market, the NYSE, and smaller "regional" exchanges. All these exchanges were manual auction markets, with a unique dealer on the NYSE, the "specialist" who is the only one in his specialty stocks, competing with limit order traders and dealers at other exchanges. In these conditions, the price was the most important dimension of order execution. Consequently, the members of ITS opted in 1981 for the "trade-through rule", whereby trading at a price other than the best one posted on any market in a security (a seller must sell at the highest bid price on any market, while the buyer must buy at the lowest offer price).²

The *trade-through rule*, which applied to the trading of NYSE and other exchange-listed securities but not Nasdaq-listed securities, paradoxically protected the NYSE from competition (in particular electronic communication networks (ECNs) that could never trade more than 5% of the trading volume in NYSE-listed securities). *De facto*, this best price criterion meant that orders were routed to the NYSE that indeed offered many times the best quotes (due to the fierce competition between brokers). Hence, competitors could not enter the market even if, eventually, the transaction price did not correspond to the quoted price because the best bid or offer may be gone before the order is executed. A quoted price can disappear or change long before an execution happens.

As of the end of the 1990s, the United States adopted a number of rules aiming to promote competition between traditional exchanges with a view to ensuring the best execution of customer orders, while guaranteeing investor protection. The Securities and Exchange Commission (SEC) initially focused on Nasdaq. In 1997, it established new *order handling rules* for Nasdaq market makers following an investigation revealing practices that were detrimental to investors.³

- The *limit order display rule* greatly increased the transparency of Nasdaq by requiring market makers to display customer limit orders that are priced better than the market maker's quote, or add to the size of a market maker's quote when the market maker is at the best price in the market.
- The *quote rule* has enabled ECNs to directly compete with Nasdaq market makers through the inclusion of their prices in the public quotation system. This rule, also known as *ECN Amendment*, requires market makers to publicly display (on Nasdaq) the price of any orders they place on an ECN if the price is better than their own public quotation. The ECN may also communicate the best priced orders entered by Nasdaq market makers to a traditional exchange (*ECN Display Alternative*),⁴ which must then display them.

¹ The National Market System established electronic linkages between existing exchanges (mainly for securities listed on the NYSE and AMEX) which Congress qualified as a public utility that must be adequately regulated. Henceforth, NMS securities are all listed on Nasdaq and on stock exchanges (Self-regulated organizations -SROs).

² This rule was established due to the practice of "trading through" one exchange for stock being sold/bought at a slightly higher/lower price on another.

³ See article published in 1994 by Christie (W.) and Schultz (P): "Why do Nasdaq market makers avoid odd-eighth quotes?", *Journal of Finance*, 49, 1813-1840, according to which Nasdaq market makers were implicitly colluding to keep spreads artificially wide (at least USD 0.25 whereas the tick size was USD 0.125).

⁴ See Special Studies: "Report concerning display of customer limit orders", May 2000 and "Electronic communication networks and after-hours trading", June 2000, Securities and Exchange Commission.

- Regulation ATS (*alternative trading systems*) adopted in December 1998 finally integrated ECNs and ATSS more fully into the NMS by allowing them to register as a broker-dealer or an exchange.

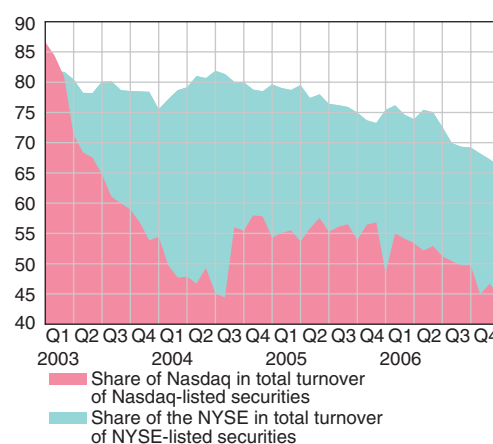
The impact on the development of ECNs was considerable and the increase in competition largely beneficial to investors. While in 1993, ECNs accounted for 13% of trading volume on Nasdaq, their share rose to 30% in 1999 and has reached 50% in recent years.⁵ Even though it is difficult to distinguish between the effects of the two main rules of 1997, it appears that, following the implementation of the new rules, the number of reported quotes increased sharply and bid-ask spreads reduced on Nasdaq.⁶ The latter effect is due to the fact that market makers posted, before the new rules, orders on ECNs that were only available to institutional investors, which represented a limited number of players.

Following *this fragmentation, exchanges lost market share in the total turnover of their own listed stocks, but also penetrated the market of their historical competitors.* Since Nasdaq started to offer, in January 2004, the dual-listing of a number of NYSE-listed stocks, competition between the two exchanges has become head-on. AMEX then adopted the same dual-listing system. There is therefore an asymmetry with the NYSE, as the latter does not authorise the trading of Nasdaq-listed securities. The NYSE regularly lost market share to Nasdaq, before regaining it through its merger with ArcaEx (Archipelago Exchange) in 2006 (see Figure A1).

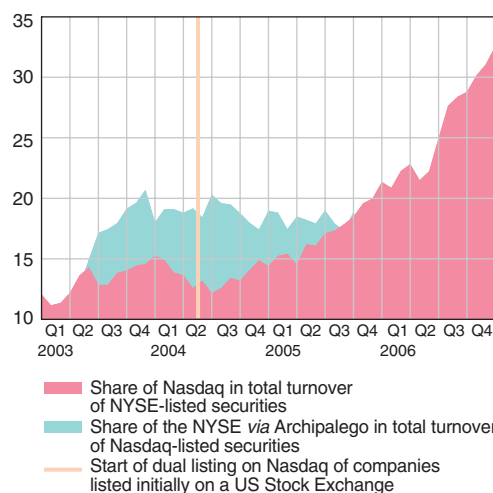
In February 2004, the SEC proposed Regulation National Market System (Reg NMS) designed to enhance and modernize the regulatory structure of the US equity markets and formally approved it in June 2005.⁷ Indeed, overlapping regulation gave rise to different possibilities for trading securities with, at one extreme, centralisation (the NYSE and the trade-through rule, with a floor structure making it geographically concentrated) and, at the other, fragmentation (Nasdaq and its electronic system).

This new regulation has notably extended the trade-through rule to Nasdaq-listed securities, but applies only to automated quotes. This measure aims to

Figure A1
Market share of US exchanges in the total turnover of stocks listed
On their own exchange
(%)



On their competitors' exchange
(%)



Sources: NYSE, Nasdaq Performance Report

⁵ In May 2004, Inet capital captured 25% of trading volumes on Nasdaq, ArcaEx 19% and Brut 9%, according to Securities Industry News.

⁶ See McInish (T), Van Ness (B) and Van Ness (R.) (1998): "The effect of the SEC's order-handling rules on Nasdaq", Journal of Financial Research 21(3), pp. 247-254.

⁷ The regulation covers four areas: the execution and processing of orders (order protection rule), access to quotes throughout the NMS (access rule), the definition of price increments (sub-penny rule) and the management and distribution of market data (market data rule). Reg NMS extends the trade-through rule to Nasdaq-listed securities.

protect customer limit orders. The main argument put forward by advocates of the trade-through rule is that it ensures that small orders at the best price are not ignored, in particular by large investors seeking a major counterparty.⁸ The scope of application of this rule has been broadened to all US listed securities, but above all, applies now only to automated quotes and no longer to manual quotes. This means that the NYSE trading floor will no longer benefit from this protection.

Having been forced to respond to competition from ECNs (by opting for a hybrid auction and electronic system in the case of the NYSE) and take account of Reg NMS that favours automated quotes, exchanges have entered into a consolidation process following a period of fragmentation. Nasdaq acquired Brut in September 2004 and Inet in December 2005. For its part, the NYSE acquired Archipelago ECN in 2006. Consolidation is already underway among ECNs, with the number of SEC-registered ECNs falling from nine in December 1999 to five in July 2004. Furthermore, in order to adapt to the new environment, a number of regional exchanges (Philadelphia and Chicago) are seeking to launch their own electronic systems.

⁸ *Opponents of this rule argue that the technological development of markets, by gradually removing human intervention, has considerably broadened best execution criteria, if only by introducing a time factor (speed of execution). Under these conditions, Nasdaq market makers have been subject, to date, to broad best execution requirements more or less corresponding to those recommended by MiFID. From this point of view, the United States has regressed: Reg NMS limits best execution to ensuring the best price for all listed securities.*

APPENDIX 2

The development of transaction costs

The annual "Global Trading Cost Analysis" survey, conducted by Elkins-McSherry and published by *Institutional Investor Magazine*, provides estimates of equity transaction costs.

These data incorporate the direct costs and part of the indirect costs, known as the *market impact*, which includes the midpoint price of the bid/ask spread and a measure of the average price shift beyond the best limit price (comparing the actual average price for a block trade with the volume-weighted average price –the mean of day's high, low, opening and closing prices– of the stock in question). The data are collected from institutional investors trading on 208 exchanges in 42 countries.

However, due to the way these data are collected, their nature and the calculation of transaction costs, a degree of caution should be exercised regarding Elkins-McSherry data. The transactions making up the database are only representative of institutional investors, which tends to overestimate market impact (which is high for these investors that generally post large orders) and underestimate explicit costs (as fees are usually lower for these investors thanks to their bargaining power).

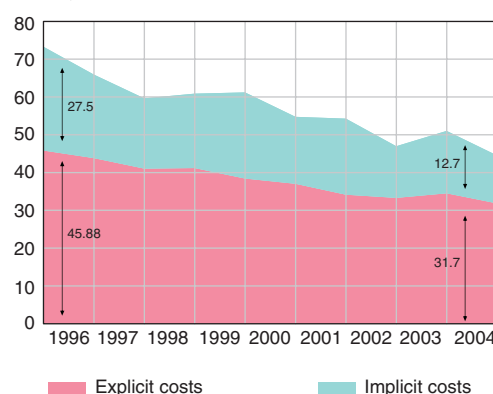
Another limitation lies in the fact that transaction costs are presented as an average per country (and not by exchange, without distinguishing between transactions carried out on a regulated market or OTC), and for all listed shares (without distinguishing between small and large caps). It is therefore difficult to attribute a transaction cost to a particular exchange, especially in countries characterised by multiple trading venues such as the United Kingdom, Germany and the United States.

Despite these limitations, Elkins-McSherry data provide very useful indications of transaction costs, showing in particular that they have declined on average by almost 40% since 1996 worldwide. This decrease was most marked for implicit costs, which fell by 55% compared with 30% for fees and commissions. Over the recent period, implicit costs have appeared to account for only a quarter of transaction costs.¹

The main driver for this cost reduction appears to be the automation-driven disintermediation of trading, which suggests that this decrease has probably been underway on and off since the end of the 1970s.² Indeed, all things being equal, electronic-based markets have significantly lower average transaction costs than their non-automated counterparts. Over the period 1996-1998, trading cost savings appear to be between 23 and 32bp on explicit costs, and between 10 and 18bp on implicit costs.

Commissions and fees have been falling steadily thanks to technological advances and the growing

Changes in global trading costs
(in basis points)



Note: Explicit costs correspond to direct costs. Implicit or indirect costs are estimated by the market impact and are negatively correlated with liquidity.

Source: Elkins-McSherry.

¹ This proportion is found at the disaggregated level for all countries, except at the end of the 1990s in North America, where the proportions were opposite (Domowitz et al., 2001).

² Elkins-McSherry data only go back to 1996.

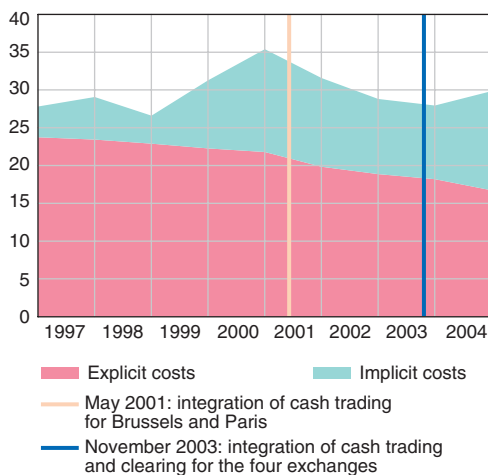
competition between intermediaries. However, *the implicit component, represented by the market impact, is subject to more erratic fluctuations and remains more difficult to "control" by exchanges as it is correlated with price volatility and trading activity.* For instance, a sharp rise in implicit costs was observed in 2000 and 2001, due to the exceptionally high volatility during this period, making it difficult to execute orders at the best price. This situation was exacerbated by the massive sell-offs observed at that time, as empirically the cost of selling is higher than that of buying.³

Unlike the situation observed on other markets, in the case of Euronext implicit costs have not returned to the level prevailing before this period of high volatility. The decline in these prices may have been less rapid because of Euronext's minimum tick size, which skews the measure of implicit costs used by Elkins-McSherry. While all US (and German) exchanges have moved to decimalisation, Euronext retains a pricing grid whereby the tick size increases with the share price. Only securities of up to EUR 50 have a minimum tick size of EUR 0.01.⁴ There are no doubt other factors behind this relatively small decline in implicit costs.

The decline in implicit costs has nevertheless been more marked in France since 2001, even though Paris was still far in 2005 from the exceptionally low levels prevailing before 2000. This result is consistent with observations by Pagano and Padilla (2005)⁵ showing that the average bid-ask spread of the securities in the CAC40 fell by around 40% since the integration of exchanges in the Euronext system. This effect appears to be due to the increase in market liquidity stemming from the larger pool of securities and the growth in cross-border trading, which has benefited the most liquid securities on the Paris stock exchange.

Transaction costs on all Euronext markets and integration process

(in basis points)

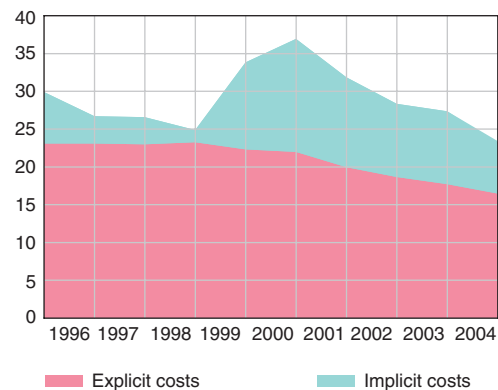


Note: Transaction costs across Euronext markets correspond to the average transaction costs of each market weighted by the year-end market capitalisation.

Source: Elkins-McSherry and own calculations.

Changes in transaction costs on the Paris stock exchange

(in basis points)



Source: Elkins-McSherry.

³ Although the reasons for this are unclear, one explanation may be that, in bear markets, when investors sell securities they are less concerned about how the transaction is executed than when they buy.

⁴ Since 2 January 1999, the tick sizes expressed in euro for shares and related securities are 0.01 up to EUR 50, 0.05 from EUR 50 to EUR 100, 0.10 from EUR 100 to EUR 500, and 0.5 above EUR 500.

⁵ Pagano and Padilla (2005): "Efficiency gains from the integration of exchanges: lessons from the Euronext "natural experiment", Report for Euronext, LECC.

APPENDIX 3

Block trading on Euronext Paris

The block trading market, sometimes also referred to as the upstairs market, exists on all stock markets. It refers to all large transactions executed outside the regulated market, *via* a broker that can act as counterparty for the transaction (broker-dealer) or that can find a counterparty through one or more dealers. Block trading is regulated to varying degrees across countries. In the United States, dealers generally offer a price at least as good as that of the listing venue. On European exchanges where the concentration rule applies, such as Euronext Paris and Borsa Italiana, execution conditions are entirely regulated in terms of the size of the transaction and the price.¹

All cash products are traded electronically on the NSC system adopted by all of the Euronext members.² NSC is a fully automated trading platform that allows members to route orders to a central order book where they are electronically matched. The orders entered into the system are directly matched according to pre-defined conditions concerning the size and possibly the price, validity date, etc.

Even though the vast majority of French residents' equity transactions are executed on Euronext Paris regulated markets³ in the NSC system, a certain number of measures were taken in 1994 to allow block trades to be executed outside the regulated market due to competition from systems that were less strict and transparent than the Paris stock exchange.⁴ These transactions eligible for block trading must reach a given size known as the normal block amount (NBA) that depends on the market capitalisation of the listed company. The price conditions then depend on the trading volume in relation to the NBA. Ordinary block trades may be carried out within the range of 5% around the last traded price, while structural block trades may be executed at a price within a range of 10% around the last traded price.⁵

These transactions are then reported to Euronext *via* the Trade confirmation system (TCS). Broker-dealers use this reporting system for their trades that are generally executed outside a regulated market.⁶

In France, according to the report published by the *Conseil des marchés financiers* (Financial Market Council) in November 2001, trades executed outside a regulated market and subject to reporting obligations are broken down as follows:

Block trades executed outside a regulated market (shares and related securities)

(amount EUR billions)

	Number of transactions	Amount
1998	76	5.9
1999	123	8.7
2000	117	8.6

Source: *Revue CMF* No. 43, November 2001, page 11

1 Note however that there is a difference between the block trading market and the upstairs market. On the upstairs market block trades are executed outside the regulated market, with varying degrees of regulation. It only accounts for a part of all block trades, which can also be executed on regulated markets. On the NYSE, a block trade is any transaction in which 10,000 shares or more of a single stock are traded.

2 These players are credit institutions and investment firms that have been authorised by the competent authorities, and place buy and sell orders on Euronext. Depending on their authorisation, they act on behalf of clients or for their own account. See "L'organisation institutionnelle et fonctionnelle des marchés d'Euronext", Euronext Paris, November.

3 It is difficult to assess for non-residents' equity transactions given that the concentration rule only applies to residents. Furthermore, the rule does not require all transactions to be executed in Paris, but on any regulated market.

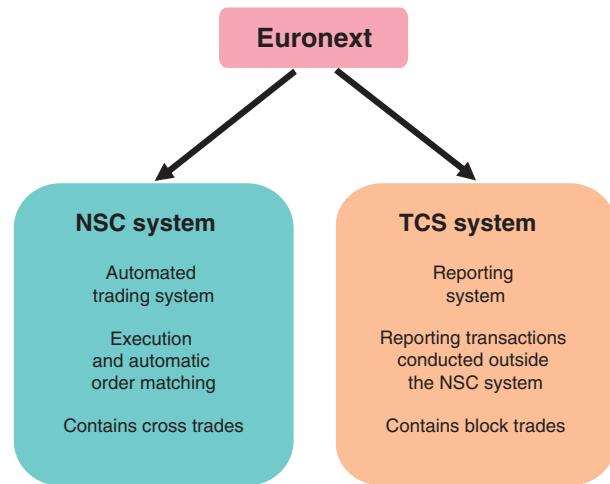
4 London only introduced the publication obligations of reporting regarding transaction prices in 1996.

5 The price conditions are defined in Euronext Rule Book, Book 1 – Harmonised Rules, Chapter 4.4.

6 Also registered in TCS are long and short positions eligible for deferred settlement (SRD), VWAP transactions, options exercises, etc. See Euronext Cash Market – Guide to transaction reporting 2007.

Relatively few trades are executed outside a regulated market. For instance, Bessembinder and Venkataraman (2004),⁷ who analysed block trades on Euronext Paris between April 1997 and March 1998, observed that less than 34% were facilitated in the upstairs market, with the remainder being executed in the order book. On the NYSE, this proportion is calculated at 27% for the period between December 1993 and January 1994 (Madhavan and Cheng, 1997).⁸

Other types of transactions are also executed outside the order book, but are immediately reported in the NSC system. The latter include cross trades, *i.e.* the simultaneous matching and execution by a single Euronext member of opposing buy and sell orders; they can be made only for securities traded continuously and must be executed at a price within the market's best bid/ask spread at the time of execution.⁹



Note: The NSC system is only for cash transactions. Derivatives transactions are managed on LIFFE Connect.

⁷ Bessembinder (H.) and Venkataraman (K.) (2004): "Does an electronic Stock Exchange need an upstairs market?", *Journal of Financial Economics* 73(1), 3-36.

⁸ Madhava (A.) and Cheng (M.) (1997): "In search of liquidity: block trades in the upstairs and downstairs markets", *Review of Financial Studies* 10(1), pp. 175-203.

⁹ See also Euronext Rule Book, Book 1 – Harmonised Rules, Chapter 4.4.