

A Survey of the Microstructure of Block Trading in European Equity Markets

Chwen Chwen Chen *

Istituto di Finanza,
Università della Svizzera Italiana

May 2003

Abstract

This paper provides a survey of the microstructure of upstairs markets of the largest five European stock exchanges. The explosive growth of institutional trades is the main factor which leads exchanges to compete for optimal trading facilities for this remarkable source of market order flow. We account for institutional similarities and dissimilarities as a key determinant of regulatory arbitrage across European exchanges and as one of factors that give rise to varying growth of institutional trading on individual European exchanges. The final view is a very wide institutional fragmentation, in particular with respect to the enforcement of interaction rules and transparency.

* E-mail: chenc@lu.unisi.ch

1 Introduction

In latest years institutional trading has become a consistent proportion of market order flow in terms of a steady growth both in the trading volume and in the average size of orders. For instance, last year J.P.Morgan reported it executed a \$1.9 billion trade; other trades too were reported to involve more than \$1 billion.¹ These figures are expected to sharply increase in coming years. Given this trend, a separate trading arrangement from the normal order flow of investors will always be needed, otherwise institutional trading would execute in alternative trading venues. What will change is then the definition of large orders ("block trades"); in other words, the size of trades defined as block trades will increase.

Whereas in the US and UK markets institutional trading is quite consolidated, most continental European exchanges are becoming very profitable markets to institutional investors mainly because of a relatively weaker public demand; this in turn is reflected in a poorer offer of trading facilities for institutional investors. Most important, at current state, despite the monetary harmonization, there exists institutional variety in the handling of large trades. This regulatory fragmentation leads to strong regulatory competition across exchanges themselves and continuously reshapes the European market structures.

From the supply side's point of view, that is from the public exchanges' point of view, the main issue concerning institutional trading is to reduce negative externalities of large transactions on the central market (or downstairs) by ensuring large trades adequate trading facilities. As being of size larger than the normal market order flow, the impact of these trades on the central market may be considerable so as to drain liquidity from the public electronic order book and create temporary liquidity shortage in the downstairs market and disorderly price movements as well. A typical situation is that, while downstairs' investors effort to search for a counterpart in the transaction of a stock, at the same time a trade of larger size on the stock is being executed on the block market. Market prices would consequently lose their signalling function. This effect would be amplified in case large trades are even information-motivated, with the consequence to distort the "true" price of assets. Exchanges are therefore called for the design of rules to avoid trade-throughs and ensure gains to all traders on the marketplace.

Another issue to account for is that institutional trades represent a considerable source of profits for trading systems providers. Block traders may work the block as whole at once or break block trades into smaller ones and work them over several days to obtain the best overall price for the customer. With the explosive development of information technology over past years, electronic-trading algorithms are actually replacing some of brokers' activity; trades of 100,000 (or even a million) shares may soon be executed electronically.² This

¹ See Davidson et al. (2001).

² The size of trades that can be executed electronically is increasing thanks to innovations such as "volume-weighted average price" (VWAP) trading, which allows institutions to execute a trade at the day's average price, and time slicing, which breaks up a block and executes it

is already a reality in the U.S. and U.K. markets not only for equity markets. In face of the competition from alternative trading systems or Electronic Network Communications (ECNs), European public exchanges are challenged in offering more competitive trading environments.

The objective of this survey is to document the trading mechanisms for large transactions in the largest five European equity markets. Our focus is therefore on the supply side of block trading, that is on the distinctive set of rules that govern the trading process for institutional trades. This set of rules is dissimilar across European exchanges, although there exist overall institutional common features. Among other factors, it may be that such institutional similarities and dissimilarities are a key determinant of the varying growth of institutional trading at individual European exchanges giving rise to regulatory arbitrage across European markets. A relevant case is the enforcement of interaction rules in the Paris Bourse in 1989, which had to be relaxed years later because of institutional competition from the London stock exchange. The analysis of the institutional framework is important because it is this set of trading rules that in the end affects the profitability of various trading strategies, and hence affects the cost of trading and the final allocation of financial resource.

Typically block transactions are conducted in off-exchange markets called upstairs markets. These are not the only public trading venue for institutional trading, though. Because of the growing importance of this source of market order flow and the effort of order flow consolidation in the central market, exchanges too offer trading facilities to incentivate institutional investors to trade in the central public order book. What is striking is that there are much common efforts and views across national exchanges as for the integration of institutional trading facilities into the central market rather than the search for common European trading institutional requirements for markets for block transaction.

This paper is organized as follows. In the next section we present a statistical comparative overview of block trading and electronic book order trading and account for the state of development of institutional trading in Europe. Section 3 reviews the trading mechanisms for blocks in the major European stock exchanges considers the possible changes. Section 4 presents the main common and different institutional features. Section 5 concludes.

2 Institutional trading: the demand side of block trading facilities

The trading of large amount (above 10,000 shares) accounts for roughly 50% of total trading volume at the NYSE.³ Almost 67% of block trading volume is ex-

over a certain time interval.

³Block trading on the NYSE amounted to 44.4% of total NYSE volume in 2002, a decline from 48.1% the prior year. This proportion was 51.7% in 2000. This decline is mainly due to the recent world economic conditions.

executed in the upstairs market at the Paris Bourse (Besseminder and Venkataraman, 2002). Table 1 and table 2 show the amount of block trades with respect to downstairs trading volume in domestic and foreign equities on the major European exchanges. Overall, we observe that trading in the central electronic order book prevails in continental European exchanges than in the London Stock Exchange. OTC-exchange trading is however consistent, and the growth has been more remarkable in the Italian Stock Exchange. In any case, London remains the most attractive center for institutional trading especially of foreign securities. This may be largely due to more flexible rules enforced for block trading in the London Stock Exchange than those in the continental European exchanges.

The main determinant for the increase of block trades is the sharp growth of institutional trading in Europe, a process which is also favoured by the advent of the single currency. Only in period 1990-1998, the value of assets managed by institutional investors grew at an annual rate of 14%, and it is expected to increase in coming years. The total value of funds under management in Europe - including the United Kingdom - is over \$10 billion, of which the United Kingdom accounts for 40% (Table 3). This trend has been however more significant in most continental European markets than in the U.S. and U.K. because the former are still contestable markets for domestic institutions and foreign intermediaries and therefore ensure excess profitability.

The main forces driving the steady expansion of institutional trading in Europe include the trend toward professional management of household assets, the shift of portfolios into equities and foreign assets, the move from defined benefit to defined contribution pensions in private sectors. Above all, the most crucial factor is the aging of population and the recognition that pay-as-you-go pension systems are unsustainable as they stand. Although these factors are present elsewhere, European countries are among those that have the greatest scope for growth in this respect having less well developed mutual funds sectors, ongoing pay-as-you-go pension systems, and little funding except in the United Kingdom, Ireland, Denmark, the Netherlands, Sweden and Switzerland. More generally, owing to the dominance of pay-as-you-go pensions, scope for expansion is arguably even greater than in the relatively mature markets of the United States and the United Kingdom, where pension systems already have major funded elements. Institutional saving is also likely to increase sharply over the next 20 years as individuals seek for their retirements.

In the light of this trend, it is clear that European exchanges face a great challenge to cope with the increasing demand of trading facilities from institutions. Exchanges have moved along two directions. On one hand, they arrange for a separate trading venue for the handling of block trades. Several surveys show that institutions and their brokers will prefer to execute their orders away from the public order book to prevent excessive front-running or mitigate price impact. They are also willing to sacrifice immediate execution if this sacrifice results in lower trading costs.⁴ On another hand, most exchanges - also in the effort of consolidating the order flow into the central market - offer institutional

⁴ see Schwartz and Steil (1996).

investors to trade the total size of blocks to be concealed on the central trading system by means of hidden orders.

3 Block trading mechanisms in Europe

In this section we outline the state of rules governing the trading of large orders in the major European stock exchanges: the London stock exchange, the Euronext markets, the Frankfurter Wertpapierbörse, the Milan stock exchange and the Swiss exchange. Institutional details of the London stock exchange, the Swiss exchange and the Euronext markets are mostly drawn from Demarchi and Foucault (1998). Pagano and Steil (1996), Pagano (1998), Biais (1998) and Demarchi and Foucault (1998) give an exhaustive description of the most important changes in the past decades in the microstructure of the respective downstairs markets of these stock exchanges. Cybo-Ottone et al. (2000) discuss about the general trends in force in securities markets, with a particular look at the European Union.

3.1 The London Stock Exchange

The London Stock Exchange is the biggest European exchange for turnover and the number of stocks listed. A quote-driven and an order-driven system⁵ are provided for both domestic and foreign securities. Right the coexistence of both trading mechanisms leads to market fragmentation, with the consequence to divert order flow from the order book. Actually, unlike in other European markets, over 50% of volume is executed away from the electronic order book. In this framework, dealers still play a fundamental role especially in the trading of large size orders.

In the London Stock Exchange, block thresholds are defined on the basis of the Normal Market Size⁶ (NMS). A transaction is considered a block and is therefore allowed to use the block trade facility if it is: a) larger than 75 times the NMS of 2,000 shares or above; b) 50 times NMS of 1,000 or 500 shares. As for European securities, a transaction can be elected to use the block trade facility if it is qualified as such on a regulated European market, or more in general, for an international security traded on the International Order Book, the threshold is above 50 times the NMS.

Block trades are mainly "worked" over the market trading session (09.00-17.00 hours). The reason is that over off-exchange trading hours there are few reference prices for market makers, therefore blocks traded off the exchange hours take place on other markets which are open. Since the introduction of

⁵The quote-driven systems are SEAQ and SEAQ International for domestic and foreign securities, respectively. SETS and International Order Book are order-driven trading systems offered for the trading of domestic and international securities. There exists also a hybrid trading system (SEATS) for domestic securities.

⁶A Normal Market Size (NMS) for a stock is roughly 2.5% of the average daily trading volume for the same stock.

SETS in 1997, when member firms were permitted to act as principal for all order sizes, large trades (> 8 Normal Market Size) in SETS are subject to a special procedure, the Worked Principal Agreement (WPA). Under a WPA, a member firm acting as principal and its client agree to execute, at some point in time in the future, a large trade. The price and size of the trade are determined at the time of agreement but the member firm can offer price and/or size improvement.

3.2 Euronext markets (the Paris Bourse, the Amsterdam, the Bruxelles and the Lisbona Exchanges)

The Euronext N.V.⁷ consists of an integrated trading platforms for the cash markets of the Paris Bourse, the Amsterdam exchange, the Brussels and the Lisbona exchanges. This order-driven trading architecture is based on the French trading system, the Nsc (Nouveau System de Cotation). The underlying market undertakings operate a series of regulated markets for financial instruments which remain separate legally, subject to the laws and to the supervision of the competent authorities of relevant jurisdiction.

The market rules that govern the Euronext markets are set forth in a "Rule Book", one for each Euronext market undertaking, as well as in "notices" issued pursuant to such Rule Book. A number of these rules have been harmonized across the Euronext market undertakings and apply equally to all Euronext markets involved (Book I of Market Rules). Other market rules, pending in view of a coming process of harmonization, remain country-specific (Book II).

The common rules for block trading in Euronext markets are in effect trading rules that were enforced at the Paris Bourse and that are subsequently extended to other markets. Before the creation of the common trading system, block trades at the Amsterdam exchange were conducted in a wholesale market completely separated from the retail segment and accounted for a relevant provision of liquidity for large transactions after the Paris Bourse. Nowadays the Paris Bourse remains the most important source of liquidity for institutional investors since almost 67% of block trades still executes on the French upstairs market. Table 4 shows the distribution of order book and block trades in cash segment for individual Euronext markets.

Block trading rules are very detailed and composed. The amount of the minimum block thresholds (the Normal Block Size⁸, or "NBS") vary depending on the phase the stock is traded (continuous or auction) and its liquidity. Block trades are prematched under two forms. First, prearranged trades can be executed between or at the current best bid and ask prices on the order book. These are called "applications". Second, a block also can be traded outside the current spread, but then the "clear the book" rule must be observed. This rule

⁷ Euronext also consists of integrated clearing and settlement systems through Clearnet SA and Euroclear, respectively.

⁸ The NBS is the minimum order size for an order to be eligible as a block trade. For each stock, it is roughly at least equal to 2.5% of the average daily trading volume in the last quarter and equal to 7.5 times the average depth at the best bid and ask prices in the last quarter.

varies depending whether the block is ordinary or structural. Within ordinary block trades, if the amount of the block trade is less than 5 times the relevant NBS, block prices must be within the Weighted Average Spread (WAS), however they are allowed to fluctuate from 5% below the best bid limit price to 5% above the best ask limit price displayed in the central limit order book. In case the amount of the block trade is equal or greater than 5 times the relevant NBS, the WAS need not to be respected. Then the allowed price is 5% around the last traded price on the central order book, during or not the trading session.

Structural block trades are defined as those block trades whose amount of the block trade is equal or greater than 5% of market capitalization of the company whose stock is being traded. In this case a spread of 10% (by referring to the last traded price on the central limit order book) is allowed.⁹

The Weighted Average Spread is the difference between a weighted average of the best ask prices and a weighted average of the best bid prices up to the Normal Block Size.¹⁰ For very large trades (>5NBS), the computation of SuperWAS (the WAS enlarged) is allowed by request.

3.3 The Frankfurter Wertpapierbörse

A main feature of Germany is that trading still takes place in eight different Stock Exchanges: Berlin, Bremen, Düsseldorf, Frankfurt, Hamburg, Hanover, Munich and Stuttgart. Frankfurt (Frankfurter Wertpapierbörse, FWB) is the largest of the eight German stock exchanges. For each exchange trading takes place in a hybrid form: orders are routed to the "Kursmakler"¹¹ by brokers on the floor or through an electronic order routing system. Since 1996 the trading of small-medium size orders takes place on Xetra, a pure order-driven market.

As far as large trades concerns, trading was characterized by over-the-counter and OTC transactions. In March 2001 the FWB introduced Xetra XXL, an exchange-based, fully electronic block trading on Xetra with the view to reduce over-the-counter negotiations by cutting down trading costs. The current version of Xetra XXL dated to November 2001 with major innovations in terms of transparency.¹² Since its launch Xetra XXL has been welcomed with market

⁹We are grateful to Charles Hoppmann at Euronext Paris for this clarification.

¹⁰Suppose the NBS for a stock is 10000 shares and the limit order book is as follows:

Buy side (B)		Sell Side (S)	
Qt	Price	Price	Qt
3 000	10	11	4 000
5 000	9	12	7 000
4 000	8	13	2 000

So the WAS will be :

$$B: (3\,000 \cdot 10 + 5\,000 \cdot 9 + 2\,000 \cdot 8) / 10\,000 = 9.1$$

$$S: (4\,000 \cdot 11 + 6\,000 \cdot 12) / 10\,000 = 11.6$$

$$WAS = 11.6 - 9.1 = 2.5$$

¹¹The "Kursmakler" acts as the specialist in the NYSE. This broker-dealer manages a limit order book for each stock.

¹²Another innovation concerns the number of instruments which are allowed to trade on Xetra XXL. Besides DAX equities, block trades on MDAX and TecDAX instruments are allowed to execute on Xetra XXL.

participants and trading volume on it is expected to increase.¹³ Because of its innovative market features for block trading, we focus on Xetra XXL henceforth.

The German trading model for large transactions Xetra XXL represents an innovation in the organization of trading systems for large blocks in the framework of public exchanges, with respect to traditional broker-intermediated negotiations, since it is nonintermediated and trades take place in a call auction market where orders are routed to an electronic closed order book. The call auction consists of predefined crossing periods based on a crossing schedule, each consisting of a crossing's pre-call phase and a crossing's call phase with random end. Between two crossing periods, the trading system is in the pre-call phase. A crossing period starts after a scheduled point in time; over this period the current crossing prices (the midpoint of the spread computed on the basis of the order book information of the reference market) are continuously displayed.

After the start of a crossing period, the change of a crossing pre-call phase to a crossing call phase is triggered by the submission of market orders or if the order limit for a buy (sell) order is equal to or higher (lower) than a predetermined threshold defined by the exchange based on the current midpoint. The change of the trading phase from pre-call to call may occur immediately at the start of the crossing period or within the crossing period. If there are no order entries, or orders not fulfilling the above criteria, the crossing period ends without switching into the crossing call phase.

Transparency in this trading model is assured because the order book is completely closed over the duration of the crossing auction. However, the phase change is displayed to market participants as a tradable order is submitted and real time information about the existence of a block order is available continuously both via Xetra and via information vendors.

A market design for large trades such as Xetra XXL shows many benefits. First, search costs for counterparts and broker commissions are reduced at minimum level. Xetra XXL is designed to explicitly reward the provision of liquidity and incentivate the entry of block orders before the call auction by cutting exchange transactions fees. Moreover, institutional traders are sure about the prices at which their trades execute, since block trades execute at the midpoint quote of the current spread of the reference market. In case of an imbalance of buy and sell volume, orders are matched according to volume/time priority. More important, institutions may not be afraid of being front-running and possible information leakage. However, it is questionable whether the execution price for block trades - the midpoint quote - is effectively a "good" price for the institution.

We note also that in this block trading model orders provide no contribution to price discovery. In the context of block crossing, order limits serve only as execution conditions and orders are only good-for-day.

¹³In particular, with the new release of Xetra XXL, the display of existing block orders led to an open interest of 247.8 million and a record sales of 35.4 million in December 2001 while the amount of 4 million shares with a volume of 311,440,000 within a single trades in May 2002 was the largest trade executed so far.

3.4 The Milan Stock Exchange

The Milan Stock Exchange has been long characterized by a very large off-exchange trading volume mainly because of the existence of statutory fixed commission on the exchange. By the concentration rule introduced in 1991 (the SIM law),¹⁴ order flow has been consolidated in an electronic limit order book for the trading of small-medium size orders, while large orders trade off-exchange through broker intermediation. Table 5 provides a historical perspective of retail and block trading at the Milan Stock Exchange after the 1991 financial reforms.

Actually, off-exchange trades, which include blocks and transactions called "fuori mercato", must be viewed as an exception to the concentration rule. Off-exchange trades are allowed provided they be executed through a prior written authorization by the client and at a better price than one could obtain on-market (best execution principle). What is not immediately clear is the meaning of the "better price". The implication is that there exists an objective and easily verified parameter with respect to which an investor can always compare the price he obtains off-exchange with those existing on the central market. Of course, as Steil (1996) notes, this parameter cannot easily be verified, and is certainly not objective. A question is how to compare prices across markets unless the investor is demanding the same service. However, allowing for a less restrictive interpretation of the "better price" principle, it may be that the "better price" (even best price) should be meant to be better (even best) to the client. This price may be worse than those prevailing on the central market, however the client may hold it as the better he can achieve for himself. The motivation underlying the best execution principle is that better prices may be attained through private negotiations.

Block thresholds, which are updated every six months on the basis of the average daily turnover of the previous six months, have ever grown. This may reflect on one hand, the increasing average volume and size of institutional trades and on another, the effort of Italian regulators to discourage trading off-exchange in order to consolidate the central market order flow. Up to date there are three minimum block size thresholds:

- not less than 150,000 Euro for stocks with an average daily turnover of less 1,5 millions Euro
- not less than 250,000 Euro for stocks with an average daily turnover between 1,5 and 3 millions Euro
- not less than 500,000 Euro for stocks with an average daily turnover between 3 and 10 millions Euro
- 1,5 millions Euro for stocks with an average daily turnover greater than 10 million Euro.

¹⁴ Amihud, Mendelson and Murgia (1990) provide a deeper insight into the Italian Exchange prior to the reforms of Italian financial markets. Murgia (1993) makes a comparative study of the market performance in the transition from the floor to the electronic trading.

3.5 The Swiss Stock Exchange

The Swiss Exchange allows for individual orders larger than CHF 200,000 to be executed off-system. For these trades, the Exchange offers a trading facility that provides for a form of electronic negotiation. Using this facility a member can make a Statement of Interest that indicate to the other members, in a non-binding manner, that he or she would like to trade in a certain stock. Members can also direct an Addressed Order to a specific member (or to several specific members), which can then be accepted, ignored or rejected.

By exchange rule, off-system trades have to be executed at prices prevailing in the central market at the time of the trade¹⁵ (Best Execution Principle). We also observe that a condition for a large transaction be executed as a block is that the participant itself assumes the position risk.

4 Institutional similarities and dissimilarities

In this section we consider the institutional common features and differences in the basic design features of block trading systems of the five European stock exchanges surveyed in the previous section. The distinction between what features are common and not is however hard in that common institutional features themselves share remarkable institutional differences. Rather than proceeding by categorizing, we identify some basic aspects in block trading mechanisms and for each design feature we outline similarities and dissimilarities across exchanges. We identify mainly five basic areas:

- enforcement of specific arrangements for block trading
- enforcement of interaction rules
- block prices are not integrated in the formation of prices
- transparency
- toward nonintermediated block trading?

4.1 Enforcement of special procedures for blocks handling

All the five exchanges provide an "upstairs market" for the handling of large trades. However, some exchanges provide for special procedures that block traders must observe over the negotiation of blocks. Overall, these procedures consist of an agreement between the counterparties before a block transaction actually takes place so that all the trade terms are firm and well known also to exchange officials. Examples of these special procedures are the applications at Euronext markets, the WPA at the LSE, the Statement of Interest at the SWX. No special trading procedure is provided on Xetra XXL, whereas in the Milan Stock Exchange block traders freely come to negotiate for large orders. The upstairs market at the Milan Stock Exchange is somehow particular with respect to upstairs markets of other European exchanges because that upstairs market is

¹⁵We thank Britta Hirschi at the Swiss Exchange for this detail.

actually not regulated, that is block transactions do not give rise to a pure block market; rather, large transactions should be considered as individual operations negotiated on regulated markets in the context of market rules dictated in this issue by the Italian regulators.¹⁶

A possible explanation for this built-in design feature - special procedures for block trading within a trading system for block trades - is that in markets where this procedure is provided block traders are often engaged as dealers.¹⁷ The size and days taken for a block trade to be "worked" may have induced Exchanges to provide special procedures for safe and good conclusion of blocks of considerable size.

4.2 Enforcement of interaction rules

Most exchanges enforce some interaction between upstairs and downstairs markets. The interaction (or crossing) rules ("best price", "cross reference", "clear the book" rule) stipulate the allowable price range for upstairs trades and whether downstairs orders that offer superior prices for smaller quantities will be allowed to participate in the transaction.¹⁸ The reference price at which block prices refer to is usually the midpoint quote or an weighted average spread; in any case, block prices are allowed to fluctuate at maximum within a 10% range.

The enforcement of interaction rule is commonly presented as an issue of fairness regarding order book users in order to prevent trade-throughs and free-riding of upstairs trades on price discovery. Further, enforcing block prices to interact with the downstairs market may in part attenuate the impact of block trades on the market and preserve the signalling function of prices. Whatever the merits of these positions, price enforcement is equivalent to immediate publication of blocks done outside the bid ask spread and represents a clear subsidy by off-exchange traders of on-exchange traders.¹⁹

Paris Bourse interaction rules, created in 1989 after members were permitted to trade for their own account, were significantly relaxed in 1994 owing to the effect of regulatory arbitrage in favor of London. Block traders in Paris routinely executed their block trades in London to avoid having to expand capital or leak information by obeying the Bourse's interaction rules. Even under the current Paris regime, block trades are still often executed in London via screens in Paris to avoid the market impact risk that a dealer might take on in trading within the Paris spread limits.

So far empirical evidence shows that relatively stringent interaction rules have the benefit of reducing price difference between downstairs and upstairs

¹⁶We thank Luca Filippa at the Borsa Italiana for this clarification.

¹⁷In the Milan Stock Exchange block traders rarely commit their own capital in block transactions because of the considerable capital amount required (Murgia and Gottardo, 2000).

¹⁸At the NYSE, for example, upstairs trades must typically be completed at prices at or within the downstairs Best Bid-Order (BBO) quotes, and downstairs participants are allowed to take a portion of the block. At the Toronto Stock Exchange, upstairs trades need to be executed at or within the BBO quotes in the downstairs market at the time the order is received.)

¹⁹see Davis and Steil (2001).

markets.²⁰ However, the debate over enforcing or not interaction rules remains open. We would point out two aspects related to crossing rules. First, they are not enforced in all exchanges. Although the Milan Stock Exchange statutes the best execution principle for block trades, block prices are actually far away from current market prices. The lack of an interaction rule in the London Stock Exchange is due to the remarkable importance of dealers in negotiating large orders; competition among dealers will keep prices to be closer to one another. Another point concerns the extent of interaction rules' restrictiveness. In Euronext markets there is a cross-sectional variation of the rule depending on the order size with consistent effects on execution costs. Besseminder and Venkataraman (2002) ...nd that for the so called eligible stocks (the most liquid stocks in CAC) trades occurring outside the quotes pay execution costs that are about 40 to 50 basis points higher than for upstairs trades executed at or within the quotes. They show that more flexible crossing rules reduce incentives to manipulate downstairs spreads.

4.3 Block prices excluded from price discovery

In all exchanges surveyed, block trading arrangements are not integrated into the price discovery mechanism of the trading system. This objective is partially obtained by making block prices to interact. Where there are no interaction rules as in the Milan and London Stock Exchanges, block prices are not considered in the computation of market indexes, although there is an implicit price impact on the market due to these large trades.

The issue about the entering of block prices into price discovery is of concern because of the size of these orders and the motivation behind these trades, whether liquidity- or information-motivated. In the former case, large trades cause only a temporary impact on market prices which then reverse to their level prior to the block trade. In the latter case, market prices are altered and the resulting prices may not be "true" prices. Many exchanges therefore require some price interactions and other bland requirements in terms of transparency. In exchanges where no price interaction is provided, block traders - acting as dealer or/and broker - are somehow entitled to reduce or eliminate pricing anomalies.

The extent to which upstairs prices enter the price discovery process has been the focus of latest empirical works. For instance, using the models of Gonzalo and Granger (1995) common factor and Hasbrouck (1995) information share methods and data of the Helsinki stock exchange, Booth et al. (2002) assess the relative importance of the upstairs and downstairs markets' contribution to price discovery. They ...nd that the downstairs market contributes more to price

²⁰see Madhavan and Cheng (1997) for the NYSE and Booth et al. (2002) for the Helsinki stock exchange. The latter ...nd that pricing difference between upstairs and downstairs market at the NYSE is smaller than that at the HSE because of an NYSE regulation which requires that an upstairs trade has to be exposed to the public in the downstairs market, as opposed to Finland's "best price" rule which only requires brokers make an upstairs trade at a price that is the best price for the customer.

discovery than upstairs market, however the downstairs market's dominance is not prevalent. Upstairs prices consist of downstairs prices plus a transitory component.

4.4 Transparency

Transparency covers three aspects of markets - pre-trade, post-trade publication and anonymity of counterparties. The issue concerning transparency has been long debated by academics and practitioners since too much transparency may jeopardize the willingness of traders to offer liquidity, especially in case large volumes are traded. In effect, institutions concern that their orders may be front-run once counterparties find that a broker who is known to have links with institutions is in the market. The combination between transparency and liquidity is ultimately left to the decision of national exchanges.

At European level there has been an effort to set up a minimum common transparency regulatory requirement under the Investment Service Directive.²¹ The result of that regulation is that national exchanges have actually adopted their own rules. The main difficulty to find common rules in transparency arises from different market structures in Europe, since London is a quote-driven system while continental stock exchanges are order-driven.

4.4.1 Anonymity

Anonymity is maintained before and after execution of blocks. The identity of counterparties is unknown, although in intermediated block markets it is likely that block intermediaries know the parties involved in the transaction.

4.4.2 Pre-trade transparency

Unlike the full access to the electronic order book to the market, in all exchanges the upstairs market remains opaque during pre-trade period. In exchanges where interaction rules are enforced, what is displayed over the trading phase is the reference price (the WAS or the midpoint of the spread). On Xetra XXL although the electronic order book is closed, transparency has been increased through the indication on the existence of block orders per stock to the market.

4.4.3 Post-trade transparency

There is a convergence in post-trade transparency rules as for tight reporting deadlines, the reporting of all trade details to exchange officials and the release of some trade details to the market (instrument identification, date and time of execution, price and quantity traded in the instrument). The post-trade information however differs in the time of publication to the market. The complex

²¹ See Steil (1996) for a discussion of the European Investment Services Directive and its effects.

procedure set forward in the European Investment Services Directive had been almost entirely ignored.

The publication of large trades is problematic. Actually it jeopardizes the ability of a market maker involved in the block trade to unwind his position in good conditions. Thus quick publication can ultimately result in bad prices for block trades. However, large trades are informative. For prices in the central limit order market to reflect the information contained in these trades, a quick publication of the price and the size of the block trade is necessary. Timely publication is also necessary in order to prevent counterparties in a block trade from trading on their superior information. This can ultimately impair the liquidity of the central limit order book, by increasing the adverse selection risk faced by limit order traders. Given these costs and benefits of quick publication of large trades, exchanges allow traders to delay publication of the large trades in which they are involved. The conditions under which this delay can occur and its duration vary across exchanges, however (see Table 1 in the Appendix). The delay allowed varies from hours to even several days later. Delays are most likely in markets where dealers take position to facilitate investor business: in the LSE, for instance, publication of large trades occurs five days following the execution of the transaction or when the block trade has been 90% offset.

4.5 Toward nonintermediated block trading?

The SWX and the FWB are the first European exchanges to introduce an electronic trading platform for the trading of large transactions. With respect to human intermediation nonintermediated electronic auction markets yield trading cost savings. Besides the elimination of broker commissions, electronic trading of large trades ensures immediate execution so to cut off execution costs, market impact and information leakage and front-running risk intrinsic in a broker-intermediated negotiation.

Today block trading is actually distributed among different execution mechanisms. The typical way remains telephone trading consisting of direct bilateral trading or brokered trading via telephone. Another venue is exchange trading through specific non automated trading systems such as upstairs markets. The rapid development of technology enables block trades to be executed through separated platforms such as POSIT, E-crossnet.

All the above mechanisms have in common a process of search for counterparties. The major risk of the search process is a likely information leakage as when a block is being "shopped" around the market and potential counterparties may learn of it so that the block is priced worse than there is no information leakage. In case of a large amount being traded, an institution wanting to trade even anonymously, will move prices adversely merely in revealing its interest. Knowledge of this interest in the market leads participants to infer that the current market price does not accurately reflect demand. Bids and offers will thus adjust accordingly even without any transaction taking place, thereby precluding the trader from filling only part of the order at the price that prevailed before the block order was revealed. The automation of block trading may re-

duce market impact and risks related when submitting large orders. However, in a completely automated trading system, what is then the economic function that upstairs markets accomplish, that is the role played by block intermediaries - acting as principal or agent? The importance of block intermediaries is expressed in the superior knowledge the intermediaries have of the order flow and that enables them to tap into unexpressed trading interests as discussed in Grossman (1992). Brokers play also a screening function by discriminating among informed and uninformed traders and imposing a sort of reputation to all parties. Empirical evidence shows that, in this respect, uninformed (institutional) traders prefer the upstairs market, while informed traders randomize their trades between the upstairs and downstairs markets.

In general, the trend is evolving to increasing disintermediation of block trading. It will likely be that human intermediation of block trades will not disappear completely. The implication is rather that intermediation that is built into trading structures by design, rather than being chosen by the investor, is unlikely to withstand increasing contestability in the market for trading systems. Competition on liquidity at different block sizes may increase from alternative trading mechanisms.

5 Conclusions

In this paper we survey the microstructure of block trading in the major European stock exchanges. We focus specifically on the trading mechanisms for block trades because of the increasing importance of institutional trading in Europe and the deriving demand for trading facilities. Our study is about the supply side to analyze how the major European exchanges respond to this consistent proportion of market order flow.

We identify some basic design features that exchanges share and that at the same time make them different from the regulatory point of view. Common institutional features include the handling of block trades in a separate trading arrangement, typically called the upstairs market; the effort to not integrate block prices into price discovery, and bland requirements in terms of regulation (transparency). The means adopted by exchanges to pursue these objectives are several. However, the national view is a wide institutional fragmentation, which mostly determines and favors regulatory arbitrage across European exchanges. In particular, institutional dissimilarities concern the enforcement of interaction rules and the level of post-trade transparency.

Institutional differences have been the main cause of failed attempts for the creation of a common European market structure, attempts initiated both by national exchanges or at European level. The regulatory differences remain also the major obstacle to remove in the process of designing a common market structure for block transactions. However, despite this fragmentary institutional environment, it will be the competition for and arbitrage in trading rules which bring European exchanges to search for common trading rules. Actually, as

surveyed by Schwartz and Steil (1996), European institutional investors seem to prefer these rules be set up by individual national exchanges rather than at European level.

References

- [1] Amihud, Y. and H. Mendelson (1991), How (not) to integrate the European capital markets, in A. Giovannini and C. Mayer (eds.), *European Financial Integration*, Cambridge University Press.
- [2] Amihud, Y., H. Mendelson and M. Murgia (1990), Stock Market Microstructure and Return Volatility, *Journal of Banking and Finance* 14, 423-440.
- [3] Besseminder, H. and K. Venkataraman (2002), Does an Electronic Stock Exchange Need an Upstairs Market?, working paper, Southern Methodist University.
- [4] Biais, B. (1998), European Stock Markets and European Unification, in *European Capital Markets with a Single Currency*, J. Dermine and P. Hillion (ed.), Oxford University Press.
- [5] Booth, G.G, J-C. Lin, T. Martikainen, and Y. Tse (2002), Trading and Pricing in Upstairs and Downstairs Stock Markets, *Review of Financial Studies* 15, 1111-1135.
- [6] Borsa Italiana, Istruzioni al Regolamento dei Mercati Organizzati e Gestiti dalla Borsa Italiana S.p.A., July 2002.
- [7] Borsa Italiana, Regolamento dei Mercati Organizzati e Gestiti dalla Borsa Italiana S.p.A., July 2002.
- [8] Burattelli, S. (1999), *Ordini e Contratti di Borsa*, Milano, Il Sole 24 Ore.
- [9] *BusinessWeek* (2002), Battle of the Bourses, October 28.
- [10] Cybo-Ottone, A., C. Di Noia and M. Murgia (2000), Recent Development in the Structure of Securities Markets, *Brookings-Wharton Papers on Financial Services*, 223-273.
- [11] Davidson, J., L.M. Grépin and C.M. Hogg (2001), Remaking Market Making, *The McKinsey Quarterly* 3.
- [12] Davis, P.E. and B. Steil (2001), *Institutional Investors*, MIT Press, Cambridge.
- [13] Demarchi, M. and T. Foucault (1998), Equity Trading Systems in Europe. A Survey of recent changes, working paper presented at the 1999 EFMA Conference in Paris.
- [14] Domowitz, I. and B. Steil (2001), Automation, Trading Costs, and the Structure of the Securities Trading Industry, in Davis P.E. and B. Steil, *Institutional Investors*, MIT Press, Cambridge.
- [15] Euronext Rule Book, Book I, Harmonized Market Rules, July 2001.

- [16] Federation of European Securities Exchanges, European Stock Exchange Statistics, May 2001 and 2002.
- [17] Gonzalo, J. and C.W.J. Granger (1995), Estimation of Common Long-Memory Components in Cointegrated Systems, *Journal of Business and Economic Statistics* 13, 27-36.
- [18] Grossman, S.J. (1992), The Informational Role of Upstairs and Downstairs Trading, *Journal of Business* 65, 509-528.
- [19] Gruppe Deutsche Börse, Xetra XXL. Market Model, version 2.0, September 2001.
- [20] Gruppe Deutsche Börse, About Xetra XXL. Release 6.5, November 2001.
- [21] Institutional Investor (1999), Euro 100 cross border express - Europe's largest money managers, *Institutional Investor*, November.
- [22] Hasbrouck, J. (1995), One Security, Many Markets: Determining the Contribution to Price Discovery, *Journal of Finance* 50, 1175-1199.
- [23] London Stock Exchange, Rules and Regulatory Guidance, July 2002.
- [24] Lucarelli, C. (2001), Gli accordi internazionali fra mercati, in Anderloni L., I. Basile and P. Schwizer (eds.), *Nuove frontiere dei mercati ...nanzari e delle securities industry*, Bancaria Editrice, Milano.
- [25] Madhavan, A. (2000), Market Microstructure: A Survey, *Journal of Financial Markets* 3, 205-258.
- [26] Murgia, M. (1993), Il Mercato Telematico Azionario, IRS, Quaderno n. 7.
- [27] Murgia, M. and P. Gottardo (2000), The Upstairs Market for Large-Block Trades: An Empirical Analysis of Price Effects on Italian Shares, Working Paper.
- [28] New York Stock Exchange, Fact Book 2001, Year in Review.
- [29] New York Stock Exchange, Fact Book 2002.
- [30] Pagano, M. (1998), The Changing Microstructure of European Equity Markets, in *The European Securities Markets: The Investment Service Directive and Beyond*, edited by Guido Ferrarini, Kluwer Law International.
- [31] Pagano, M. and B. Steil (1996), Equity Trading I: The evolution of European trading systems, in B. Steil (ed.), *The European Equity Markets. The State of the Union and an Agenda for the Millenium*, Royal Institute of International Affairs, London.
- [32] Schwartz, R.A. and B. Steil (1996), Equity Trading III: Institutional Investor Tradig Practices and Preferences, in B.Steil (ed.), *The European Equity Markets*.

- [33] Seppi, D.J. (1990), Equilibrium Block Trading and Asymmetric Information, *Journal of Finance* 45, 73-94.
- [34] Smith, B.F., A.S. Turnbull, R.W. White (2001), Upstairs markets for Principal and Agency Trades: Analysis of Adverse Information and Price Effects, *Journal of Finance* 56, 1723-1746.
- [35] Steil, B. (1996), Equity Trading IV: the ISD and the Regulation of European Market Structure in B. Steil (ed.), *The European Equity Markets. The State of the Union and an Agenda for the Millenium*, Royal Institute of International Affairs, London.
- [36] SWX Swiss Exchange, Directive 11: Reporting requirement with respect to Sensitive Block Transactions, Version 01.01.2000.
- [37] SWX Swiss Exchange, SWX Trading info, at website: www.swx.com/market/trading_organisaion_en.html
- [38] Trovatore, G. (2001), Concentrazione degli scambi e competizione tra sistemi di trading, in Anderloni L., I. Basile and P. Schwizer (eds), *Nuove frontiere dei mercati ...nanziani e delle securities industry*, Bancaria Editrice, Milano.
- [39] Wells, S. (2000), Price Discovery and the Competitiveness of Trading Systems, FIBV Annual Report.

Table 1 - Domestic Equity Turnover - end May 2001 and May 2002
All market segments, Euro millions (single counted)

Exchange	May 2001			May 2002		
	Trading days	Electronic Order Book Transactions	Negotiated Deals	Trading days	Electronic Order Book Transactions	Negotiated Deals
LSE	21	89 803.5	96 997.5	22	90 243.5	90 338.2
Euronext [¶]	23	153 295.0	66 666.1	22	137 567.0	61 434.0
DB AG ^{¶¶}	22	73 008.0	68 730.3	22	70 283.0	38 144.0
Blit	22	57 670.7	7 219.0	22	52 346.6	4 021.9
SWX	21	38 880.0	10 722.2	22	2 397.2	634.8

Source: FESE

Notes - LSE: the London stock exchange; DB AG: the Deutsche Börse AG; Blit: Borsa Italiana (the Italian stock exchange); SWX: the Swiss exchange. "Negotiated Deals" refer to deals negotiated by brokers and reported to the Exchanges.

[¶]Euronext markets statistics refer to the Paris Bourse SBF, the Amsterdam and the Bruxelles Exchanges.

^{¶¶}Note that ...gures about the DB AG include all the German stock exchanges.

Table 2 - Foreign Equity Turnover
All market segments, Euro millions (single counted)

Exchange	May 2001			May 2002		
	Trading days	Electronic Order Book Transactions	Negotiated Deals	Trading days	Electronic Order Book Transactions	Negotiated Deals
LSE	21	530.8	319 351.6	22	2 400.0	217 031.9
Euronext [¶]	23	1 102.0	735.0	22	1 628.0	524.0
DB AG ^{¶¶}	22	2 350.0	11 979.6	22	2 934.0	6 213.0
Blit	22	3 203.2	2.7	22	6 513.2	59.4
SWX	21	1 609.7	132.1	22	879.4	176.1

Source: FESE

Notes - LSE: the London stock exchange; DB AG: the Deutsche Börse AG; Blit: Borsa Italiana (the Italian stock exchange); SWX: the Swiss exchange. "Negotiated Deals" refer to deals negotiated by brokers and reported to the Exchanges.

[¶]Euronext markets statistics refer to the Paris Bourse SBF, the Amsterdam and the Bruxelles Exchanges.

^{¶¶}Note that ...gures about the DB AG include all the German stock exchanges.

Table 3 - European Money Management Centers

	\$ billion	Percent of total
United Kingdom	4132	40
Switzerland	1997	19
Germany	1456	14
France	938	9
Netherlands	936	9
Italy	306	3
Sweden	257	2
Spain	154	1
Belgium	82	1
Ireland	38	0.4

source: Institutional Investor (1999).

Table 4 - Euronext markets (equity segment)

Euro millions as from Dec 1999 to Dec 2001

Year	Location	Trading days	Value of Domestic Shares		Value of Foreign Shares	
			Electronic Order Book	Reported Deals	Electronic Order Book	Reported Deals
1999	Amsterdam	22	34 047.0	19 318.0	78.8	373.7
	Bruxelles	22	3 499.3	96.6	356.2	11.6
	Paris	22	67 676.5	n/a	920.8	n/a
	Lisbon and Oporto	19	4 597.3	n/a	n/a	n/a
2000	Amsterdam	19	41 057.6	29 275.3	10.4	77.3
	Bruxelles	18	3 722.4	94.8	251.9	7.3
	Paris	19	89 463.8	5 675.1	1 041.1	13.6
	Libon and Oporto	17	4 581.2	n/a	5.0	n/a
2001	Amsterdam	18	33 865.5	15 506.2	14.8	5.2
	Bruxelles	18	3 018.1	16.2	214.6	59.3
	Paris	18	65 410.9	12 055.5	621.5	28.8
	Libon and Oporto	17	2 061.2	n/a	2.5	n/a

Source: Paris Bourse SBF.

Table 5 - Milan stock exchange: upstairs and downstairs trading
Equity segment

	Order book trading		Block trades	
	Trades Number	Turnover ML Euro	Trades Number	Turnover ML Euro
1995	4 867 774	72 721.3	1 062	5 396.0
1996	5 494 904	81 129.1	1 220	3 168.3
1997	11 880 773	175 370.1	1 539	7 271.6
1998	24 884 935	424 852.8	3 126	18 775.6
1999	28 236 736	502 990.1	3 128	28 370.1
2000	50 687 351	838 491.7	4 796	46 544.3
2001	36 740 354	637 074.9	4 583	45 492.6
2002	37 042 552	622 897.8	3 804	28 904.3

Source: Borsa Italiana, Fatti e cifre 2002.

APPENDIX

TABLE 1 Price and Publication of Large Orders

	Publication delay for Block Trades	Block Price
NSC	Order size < 5 NBS	i) No obligation to execute orders posted at better prices in the limit order book
	i) 2 hours if broker acts as counterparty ii) Immediate if broker acts as agent	ii) Block price must be inside the weighted average spread, that is computed using the best ask and bid prices in the limit order book up to NBS ^{**}
	Order size > 5 NBS	
	i) Next morning if broker acts as counterparty ii) Immediate if broker acts as agent	
	Structural blocks ^{**} Immediate or T+2 if member acting as principal has not offset his position	ii) Structural block prices can be within +/- 10% of the best ask and bid quote
SETS ^{***}	Ordinary risk trade: Immediate publication Worked Principal Agreement: End of the trading day or once 90% of the transaction is offset	i) No obligation to execute orders posted at a better price in the limit order book ii) No price link with central limit order book
SWX	30 minutes	i) No obligation to execute orders posted at better prices in the limit order book ii) Rule of Best Execution: same execution prices as those that could be realized in limit order book.
XETRA XXL	At the end of the trading day (8.30 pm)	Reference price: the midpoint price in the XETRA at prespecified times
Blt	i) 90 minutes of the execution of block trades if blocks traded during the trading session ii) within 9.00 am next day if executed off-trading hours	Wholesale orders can be executed at any price

Source: Demarchi and Foucault (1998) and national stock exchanges' rules.

* The value of a structural block must represent at least 2% of the company's capital or be greater than FF50m for a stock with a market capitalization larger than FF1bn. It must be at least 5% of the company's capital otherwise.

** A larger spread (SuperWAS) is computed for block trades larger than 5NBS on request to SBF. These trades can be executed at prices within +/-5% of best bid and ask prices.

*** Different publication rules are used for stocks that trade in SEAQ (see Pagano and Steil (1996)).

In particular, rules and market practices governing the trading process, such as how trading orders are submitted and what trading information must be disclosed, can affect the creation of liquidity. This raises the question of whether changes in market structure can enhance the provision of liquidity. Is there a "Golconda exchange" that provides optimal liquidity? What is microstructure? Issues related to market liquidity are part of a broader analysis of the microstructure of markets. Market microstructure refers to the study of the process and outcomes of exchanging assets under a specific Market Microstructure: The Impact of Fragmentation under the Markets in Financial Instruments Directive. CFA Institute Centre for Financial Market Integrity. Contents. A share of European equity trading volumes since the implementation of MiFID. However, this has steadily declined as multilateral trading facilities (MTFs) have gained an increasing share of trading volumes over the period under review. The microstructure of securities markets "the structural factors which determine how investor preferences are revealed in prices and volumes" is crucial to the efficient functioning of markets. Microstructure is concerned with key issues such as trading costs, transparency, price formation, and market design. Capital Markets: Market Microstructure eJournal. Subscribe to this free journal for more curated articles on this topic. FOLLOWERS. If you need immediate assistance, call 877-SSRNHelp (877 777 6435) in the United States, or +1 212 448 2500 outside of the United States, 8:30AM to 6:00PM U.S. Eastern, Monday - Friday. Submit a Paper Section 508 Text Only Pages. SSRN Quick Links.