Free University of Bozen - Bolzano

School of Economics

Bolzano, Italy

Working Paper No. 36

The upstairs market for large-block trades: An empirical analysis of price effects for Italian shares

Pietro Gottardo and Maurizio Murgia

July 2003

THE UPSTAIRS MARKET FOR LARGE-BLOCK TRADES:

AN EMPIRICAL ANALYSIS OF PRICE EFFECTS FOR ITALIAN SHARES

Pietro Gottardo[a] **and Maurizio Murgia**[b,*]

[a]*Universiy of Pavia, 27100 Pavia, Italy*

[b]*School of Economics and Management, Free University of Bozen-Bolzano, 39100 Bozen-Bolzano, Italy*

This revision

July 2003

*Corresponding author: School of Economics and Management, Free University of Bozen-Bolzano, 39100 Bozen-Bolzano, Italy, e-mail address: maurizio.murgia@unibz.it. We are grateful to Gordon Gemmill and seminar participants at EFMA 2000 for helpful comments and suggestions. We also thank Luca Filippa of the Italian Exchange and CED Borsa for providing us with the data used here.

THE UPSTAIRS MARKET FOR LARGE-BLOCK TRADES:

AN EMPIRICAL ANALYSIS OF PRICE EFFECTS FOR ITALIAN SHARES

Abstract

In this paper we analyse the effects of large block trades on market prices of Italian shares. Block trades on the Italian Stock Market are negotiated off-exchange with no interaction rules and a 60-minute disclosure time. Our sample embraces a period where listed stocks migrated gradually from the floor-based daily call auction to the electronic continuous trading system. In the meanwhile off-exchange block trades gradually declined, and they remained a viable trading option mainly for mid and small-cap stocks.

We find that both seller and buyer-initiated blocks experience significant temporary and permanent price impacts. Price effects are also economically relevant. When trading in the central market is conducted in the open-outcry daily call auction, price impacts are consistently higher.

We then analyse whether price effects are related to trade size as predicted by some theoretical model. Our findings show that temporary effects are an increasing function of any measure of block size, while permanent effects are not.

We interpret our results as consistent with an upstairs market mostly used by traders who can credibly signal that they are uninformed [e.g., Seppi (1990)], and the implicit trading costs we uncover is further evidence of the importance of noninformational liquidity events that may affect significantly and permanently firms' market valuation.

Key words: Block trading; Price impacts; Liquidity and Market Microstructure.

JEL classification: G12, G14

1. INTRODUCTION

The design of a trading mechanism to handle block transactions has been a controversial matter in many securities markets. The issue is of obvious relevance for traders, exchanges, regulators and economists, since different trading arrangements may provide different levels of market liquidity and execution costs. For example, institutional investors, probably the first beneficiaries of an efficient block trading mechanism, are increasingly taking a closer look at the cost of trading as they seek better investment performance and lower costs[1]. Therefore, it does not surprise that many financial exchanges around the world provide special mechanisms both for packaging and for delaying the publication of large transactions.

Exchanges adopting a dealership structure have been mainly concerned with the issue of disclosure, or whether different publication rules for block trades have any impact on market prices and liquidity[2]. Hybrid specialist limit-order markets, such as the New York Stock Exchange (NYSE), may offer some advantages over pure dealership systems when large trades must be handled effectively. At the NYSE, for example, there are two distinct trading mechanisms for block trades. A block can be handled in the downstairs (floor) market, where the specialist may take a part of the trade or, alternatively, a block can be directed to the upstairs (telephone) market where a broker usually contacts potential buyers and sellers. Madhavan - Cheng (1997) find that most blocks on Dow Jones Industrial Average stocks are executed downstairs, and they do not find any significant difference between execution costs of block trades handled downstairs or in the upstairs market. They suggest that upstairs markets convey only small benefits to the average block initiator and that *such a trading mechanism permits transactions that would not otherwise occur in the downstairs market.* Other studies addressed the issue of comparing liquidity and transaction costs on NYSE and

---

[1] There have been several studies that analyze the link between trading costs of institutional trades across different investment strategies. See for example, Chan - Lakonishok (1995, 1997) and Keim - Madhavan (1995, 1996, 1997). From a different, although related perspective, Edelen (1999) shows that much of the average US equity mutual fund underperformance can be attributed to the costs of liquidity-motivated trading. Furthermore, the pressure to find better mechanisms to deal with large tranches of shares is constantly on the agenda of investors and exchanges. As an example, Optimark, a sophisticated electronic order-matching system has been recently launched to allow big institutional investors to directly access each other and reduce price effects on large orders. The New York Stock Exchange has done all it can to stop it, then deciding to launch soon its own electronic system for large blocks (Institutional Xpress). See The Economist, *Good-bye to all that*, January 30th, 1999.

[2] See Gemmill (1996) for evidence on the London Stock Exchange. Gemmill shows that neither the price speed of adjustment nor stock's liquidity is affected by delaying block trades publication. He suggests that London's marketmakers strong position for delaying trades publication may be explained by their interest to slow the creation of an upstairs (auction) market for large transactions. Moreover, some theoretical papers [e.g., Pagano (1989), Pagano - Roell (1996) and Seppi (1990)] have suggested that large traders may still search liquidity

NASDAQ markets. Keim - Madhavan (1995, 1996) and LaPlante - Muscarella (1997) present evidence which is consistent with NYSE system providing more liquidity and smaller price impacts for block trades on comparable traded securities. Chan - Lakonishok (1997), however, challenge this view. They show that institutional investors pay lower trading costs when they trade small stocks on Nasdaq, while trading costs on large capitalisation firms are lower when trading on NYSE. Thus, the benefits of each market architecture must be found in each market's area of specialisation.

Block trading arrangements and their associated price effects in pure order-driven markets, such as many European securities exchanges, have been less extensively studied, and the available evidence is about the price effects of block trades executed in the central (or downstairs) market[3]. In theory, a pure order-driven exchange should pay much more attention to the efficient design of a block trading mechanism. Order-driven markets are usually very liquid and cost-efficient when dealing with round lots and small trades. However, they do not offer enough depth for large transactions, and block brokers-dealers must be employed to locate substantial purchase or sale interests not immediately visible either on the floor or in the electronic book.

In this paper we analyse price effects of block trades on ordinary share prices traded at the Italian Exchange during the five-year period 1992-1996. Our study contributes in several respects to the literature on the price impacts of upstairs block trading. *First*, we analyse block price effects in an *ad hoc* trading mechanism, making possible an unambiguous comparison of price formation and liquidity in block versus central markets. Most previous studies identified block trades by their size[4]. However, as emphasized by Seppi (1990) and Keim - Madhavan (1996) this mixture can significantly affect empirical results. Our paper may provide some fresh evidence on the effects of large trades executed on a separate trading mechanism. *Second*, traders negotiating blocks outside the central market are not constrained to satisfy existing orders on the electronic book at equivalent or better prices. The lack of an interaction rule makes our sample even more appropriate for a better understanding of the separate pricing

---

through direct matching and cooperation with dealers, if personal contacts, reputation and trust between upstairs traders are an important factor for distinguishing between informed and liquidity traders.

[3] Ball - Finn (1989) analyse a sample of block transactions on the auction market of Sydney Stock Exchange finding permanent effects but not price reversals. Riva (1996) analyses block trade price impacts on the Paris Bourse central market finding both temporary and permanent effects, particularly for buyer-initiated blocks. Martinez et al. (1999) investigated block trades on the Spanish Stock Exchange central market. They conclude that block trading do not produce permanent price effects, and that their results can be explained by the market microstructure of the Spanish Exchange.

[4] See Scholes (1972), Kraus - Stoll (1972), Dann-Mayers-Raab (1977), Mikkelson - Partch (1985), Holthausen, Leftwich - Mayers (1987,1990) and Seppi (1992).

behavior of block trades. *Third*, the institutional setting of the Italian Exchange allows us to exclude any observed price effects linked to security firms as market makers. Although regulation allows brokerage firms to trade on their own account, their role in the block market has been primarily of pure search brokers. *Fourth*, some recent papers [e.g., Keim - Madhavan (1996)] focused on proprietary databases of institutional trades to exploit the distinctive price effects of upstairs trading. In this study we examine the behavior of the whole market, therefore making our evidence clean from specific aspects of the institution's investment and trading strategies. *Finally*, our sample of block trades embraces a period where listed shares on the Italian Exchange migrated from a daily open-outcry auction to the electronic-based continuous order-driven market. This change in the central market trading structure allows us to analyse whether a different trading mechanism in the downstairs market may offer greater liquidity and makes it possible to reduce price pressure and adverse selection. In this way our study may add new evidence to the debate of the merit of different trading structures to provide liquidity for block transactions.

This study is closely related to empirical analyses that have investigated price effects and their determinants of upstairs block trades in US equity markets [see, e.g., Keim - Madhavan (1996) and Madhavan - Cheng (1997)], and our sample of shares may provide a useful comparison between the small caps examined by Keim - Madhavan (1996) and the Dow Jones stocks analysed in Madhavan - Cheng (1997).

Our results show that block trades induce significant price effects on the Italian Exchange and they are relevant from an economic viewpoint. Both seller and buyer-initiated blocks experience a relevant temporary effect, which increase monotonically with trade size. These findings suggest that price pressure is a major factor to explain block trades effects in the Italian Exchange. Results for permanent effects, however, are less conclusive. Seller-initiated blocks show significant negative effects, which increase with the length of pre-block interval. However, we find an inverse relationship with block size, with larger blocks exhibiting a smaller and not significant permanent price impact. Thus, while we may conjecture that some information leakage and broker selling activity is observed prior to a sell order, the negative correlation with trade size casts doubt on the information content of large sales of blocks. Permanent effects of buyer-initiated blocks tend to be positive and significant around the trade-day window, but not for all block size classes. Other pre-trade intervals show even a significant negative permanent impact, which usually persist in the twenty-day period after the block date. Also for buy orders we cannot detect any relationship between permanent impacts and trade size, and this result holds regardless of block size definition we adopt.

However, the sample of buyer-initiated blocks shows more clearly that after 1994, when the central market trading mechanism was definitely converted from the floor based daily call auction to the electronic continuous market, the behavior of block price effects became more consistent with the available evidence from others upstairs markets.

The remainder of the article is organised as follows. The next section describes existing theoretical models that make specific predictions to explain price impacts of block trades. Section 3 outlines institutional details and the organisation of the block market at the Italian Exchange. Section 4 describes the data set. Section 5 presents our methods and reports empirical results. The final section concludes the paper.

2. THE PRICE EFFECTS OF BLOCK TRADES: HYPOTHESES

There are three main explanations for price changes associated with block trading: liquidity costs, inelastic demand curves, and information effects.

Short-run liquidity costs create temporary price effects if it is costly to identify potential buyers and sellers [Kraus - Stoll (1972)]. Many financial exchanges have formal mechanisms for providing liquidity services to large transactions through dealers and market makers. In this market setting the seller (buyer) of a large block gives the purchaser (seller) a price concession as compensation for inventory and search costs. Klaus - Stoll (1972) suggest that block trades are negotiating *at a price away from the equilibrium price*: the seller of a block will trade at a lower price, whereas the buyer of a block will pay a premium. Under this hypothesis, market prices subsequent to the block transaction quickly revert to the former equilibrium.

Prices change around large transactions if there are insufficient close substitutes for a particular firm’s stock. To shed some light on this issue several studies have examined the elasticity of demand for stocks during secondary offerings and additions to and deletions from market indexes[5]. If sellers of blocks face a demand curve not perfectly elastic, the market price falls as buyers are offered a discount to induce them to purchase and hold more shares. A similar argument leads to a premium for large block purchases if the excess supply curve is upward sloping. Assuming information about firm’s future cash flows and risk is unchanged, the inelasticity of demand curves may produce a permanent price effect around block transactions. The hypothesis of not perfectly elastic demand for a firm’s shares also implies that we should observe different price impacts across firms with different demand elasticity.

[5] See Scholes (1972), Mikkelson - Partch (1985), Harris - Gurel (1986), Shleifer (1986), Dillon - Johnson (1991), Loderer-Cooney-Van Drunen (1991), and Lynch - Mendenhall (1997).

Mikkelson - Partch (1985), for example, have suggested that demand for a firm's shares is less elastic for smaller, less traded, and probably less researched stocks.

Block transactions have also permanent effects if trades reveal private information. Under this hypothesis, the sale (purchase) of a large block suggests that the sellers (buyers) believe the firm's shares are overvalued (undervalued). Theoretical models of block trading [see, e.g., Burdett - O'Hara (1987), Easley - O'Hara (1987), Seppi (1990), Grossman (1992) and Keim - Madhavan (1996)] suggest the size of trade may also proxy for the amount of information, and predict that price impact is an increasing function of order size. However, Kyle (1985) has suggested that informed investors would make numerous smaller trades rather than one large trade to camouflage their trades, and Barclay - Warner (1993) have found that medium size trades have higher price impacts. Thus, market prices incorporate traders' information gradually, and the resulting relation between order size and price effects is attenuated. Some authors have also suggested that the information effect of a block trade is related to the identity of the buyer or seller because some categories of investors are more likely to possess private information [see, e.g. Scholes (1972)]. This relationship may be important in upstairs markets where brokerage firms negotiate with investors whose identities are known, and block brokers may infer differences in trading skill and investment style. Chan - Lakonishok (1997) and Keim - Madhavan (1997) have suggested that institutional investor's identity may help to explain cross-sectional differences in execution costs. Seppi (1990) develops a model where liquidity traders may trade a large transaction rather than numerous smaller trades if they can credibly signal to the block broker they are not informed. In Seppi's (1990) framework, brokerage houses act as principals in the upstairs market: they screen information traders and build with clients an implicit commitment rule not to trading again in the stock until the desk has traded off its block position. Thus, the resulting equilibrium in Seppi's model is that blocks are traded upstairs only for uninformative rebalancing reasons.

3. BLOCK TRADING ON THE ITALIAN EXCHANGE

In this section we summarise the institutional features of the Italian Exchange block market that are relevant for our study. They are based on the published rules of both the Italian Security Market Authority (CONSOB) and the Exchange, as well as conversations with Exchange and Security firm personnel.

3.1 Institutional setting

Large block transactions have been always very common in the Italian Stock Market. Until 1992 the Italian market had no order-flow consolidation rules, large blocks were executed away from the central market and disclosure was not mandatory. Although there exist no official data to give an estimate of the relative importance of off-exchange transactions before 1992, experienced participants agree that they were a consistent part of market turnover.

In 1992 a new security market law made mandatory the consolidation of order flow in the central market, with only few exceptions. One of these has been the creation and regulation of a market for block trades. Regulators opted for an intermediate approach: brokerage houses were allowed to negotiate block trades outside the exchange's central market if the transaction value was greater than some block size thresholds. The new regulation did not set any price interaction rule and block trades did not have to be crossed on the central market. In 1992 there were three mandated minimum block thresholds: a) 250m lire (at that time, about $ 200,000) for stocks with an average daily turnover of less than 1bn lire; b) not less than 25% of the average daily turnover for stocks with an average daily turnover between 1bn and 3bn lire (about $ 400,000, assuming an average turnover of 2bn lire); c) 750m lire (about $ 600,000) for stocks with an average daily turnover greater than 3bn lire. Ever since regulators and then the Exchange itself, in an effort to concentrate liquidity onto the central market, have continually updated and increased both block size thresholds and turnover bands. The joint effects of the regulatory process and growing liquidity of the exchange's consolidated order book have led to a substantial decline of off-market block trading activity. From 1992 to 1996, the ratio of block trades to central market turnover fell to 4% from 28%.

3.2 The mechanics of block trades

Block trades might be executed away from the central market in an intermediate (direct phone-negotiated) arrangement between exchange member firms (SIM). Exchange members can act in dual capacity (broker-dealer), although they were rarely committing their capital in the block market, and their role has always been as a pure block broker. Presumably, one reason security firms avoid block positioning in the Italian Exchange is the high average value of a typical off-market block transaction. Many brokers, however, blamed stock market volatility as the main obstacle. We learned from discussions with several brokerage houses that most of the time a typical block trade is executed on behalf of domestic and foreign institutional investors. Beside portfolio trading reasons, many brokers have also suggested dividend capture strategies around ex-dividend time as another frequent motivation to engage in block trading[6]. Moreover, given the relatively high concentration of ownership structure of Italian listed companies, brokerage firms were occasionally matching trades with some large (or even controlling) shareholder. Thus, in an uncommon institutional framework, large shareholders of listed firms were sometimes acting as security dealers and, presumably, profiting from performing the role of *counterparty of last resort* in the block market.

Security firms must report all block trade details (including buyer/seller identity) within 90 seconds of execution to the Security Market Authority. Then the Market Authority makes public, through the Exchange electronic network, some of block trade terms (i.e.: date, execution time, stock's name, number of shares traded and price) in 60 minutes if the trade has been executed during trading hours or by the beginning of next-day opening session if execution has been done off-trading hours.

At the end of 1991 the Italian Exchange introduced its new electronic trading system, phasing a gradual transfer of listed shares from the open-outcry daily call auction to the electronic continuous order-driven market. However, an electronic call auction was established to open the continuous trading session. This market microstructure switch ended in April 1994, when all listed shares were trading on the new electronic trading platform. Thus, our data also provide the opportunity to analyse price impacts of block transactions in the two different central market trading mechanisms.

4. DATA

Our block trades data set is a file containing public information disclosed through the Exchange electronic network on block transactions of ordinary shares listed on the Official Market of the Italian Exchange in the five-year period from January 1992 through December 1996. The final sample contains 11,411 trades[7]. The *Servizio Studi Sviluppo e Dati* of the Italian Exchange has provided data. The data set identifies the following:

- the transaction date and time
- the name of the stock traded
- the quantity (number of shares) of the trade
- the block trade price.

---

[6] Michaely - Murgia (1995) show that block trading in the Italian stock market around the ex-dividend day period is significantly related to differential taxes. To shed some light on the importance of tax-driven block trades we compute both the number and value of block trades in the days (-10, +10) surrounding the ex-dividend dates. Approximately, they account for about 26%, suggesting that tax motivated block trading could be an important feature of our data.

[7] The original sample contained 11,750 block trades. We removed 339 blocks because of missing central market data.

To conduct our study we supplement block data with daily central market transactions retrieved from the tapes (DRG) of the EDP Centre of the Italian Exchange (CED Borsa). Several other sources complement our database, including the Italian Exchange Annual Fact Books and Monthly Statistics as well as firm specific data from an investment bank's publication (*Mediobanca, Indici e dati*).

5. EMPIRICAL ANALYSIS

5.1 Inferring trade direction

Our block data set does not allow us to know whether a block was purchased or sold. Therefore we follow a procedure similar to that suggested by Lee-Ready (1991) to infer block trade initiation. Using previous day closing price we classify 99.8% of our sample as either buy-initiated or sell-initiated block trades. For the remaining few zero-tick blocks we relied on the price two-days before the block was executed.

5.2 Summary statistics

In Tables 1 and 2 we present some descriptive statistics of block trades in sample. Table 1 contains results for the seller-initiated blocks and Table 2 for the buyer-initiated blocks. In both Tables we report: a) number of blocks; b) mean (median) number of shares traded (in thousands); c) mean (median) block size, expressed as a percent of shares traded to the total number of shares outstanding on day t=-21 (or earlier), where day t=0 is the block trade date; d) mean (median) value of blocks expressed in million of US dollars; e) mean (median) stock's market capitalisation, computed as the product between total number of shares outstanding and market closing price at day t=-21 (or earlier). With the intent to make our figures comparable to previous studies, both block trade and firm's market capitalisation Lire values have been converted to US dollar using the official daily exchange rates computed by the Bank of Italy.

A first inspection on Tables 1 and 2 reveals some common features of both seller and buyer-initiated block trades. Sampled transactions are quite large compared to previous empirical analyses; for the whole sample the typical block trade involves an average of more than 1m shares, about 2.5m in dollar value, and 0.35% of a company's equity[8]. Block trading

[8] For example, Holthausen-Leftwich-Mayers (1990) study a sample of NYSE downstairs blocks where the proportions of equity average 0.15 percent for a sale and 0.12 percent for a purchase. Keim - Madhavan (1996) report a median equity proportion of 0.34 percent for a sale and 0.16 percent for a purchase in their sample of only upstairs trades in NYSE, AMEX and NASDAQ small-cap firms. However, the median number of shares traded is considerably lower than in this paper: 33,000 for a sale and 24,000 for a purchase.

activity changed considerably in the study period. Since 1995 the number of blocks decreased significantly and the average size increased. The observed pattern can have at least two explanations. First, the joint efforts of Security Market Regulator and the Exchange to consolidate order flow in the central market, made off-exchange block trades available only for very large trades. Second, the microstructure improvements in the central market trading mechanism probably resulted in a greater depth and liquidity of the electronic book, making even medium size trades easier to execute. The new central market trading mechanism could have made it possible to break up a block into a sequence of small/medium trades, leaving the off-exchange block market available only for particular trading strategies. The latter explanation is consistent with our findings that small size blocks, which usually involve shares of large firms, experienced the most dramatic reduction in activity in the last two years of the study period. We observe only a few dozen block trades involving shares of large firms, compared to several hundreds executed between 1992 and 1994. On the contrary in the last two years in the sample, block trading has been active mainly for medium and small companies, probably giving them a viable trading option to increase their own stocks' liquidity.

Our sample of block trades is slightly dominated by buyer-initiated blocks, and that seems particularly true for stocks with larger market capitalisation. Previous empirical research on block trading has often pointed out the asymmetry of buy and sell blocks, with the latter being more frequent than purchased blocks. Generally, we observe a good correlation between block trade direction and stock market returns: seller-initiated blocks predominate in 1992 when the market index (*Mib Storico*) fell about 12%, and buyer-initiated blocks are more frequent in 1993 and 1994 when the market went up almost 40%. In the last two years of the sample, however, buy and sell orders are roughly equally distributed.

In Tables 1 and 2 we also divide our statistics into five block size quintiles in order to detect some preliminary relationship between block transactions and size of trades as predicted by several theoretical models. Similar to previous studies we find that as block size increases the number of trades decreases and larger block transactions cluster around the shares of medium and small firms.

5.3 The price effects of block trades: summary results

Following previous research on the price effects of block trading, we distinguish between temporary and permanent components of the price changes surrounding a block transaction. Temporary impacts are price reversals observed after the block has been executed.

Temporary price movements are frequently associated either with price pressure or with liquidity costs that must be incurred to accommodate and absorb a large transaction. Permanent price impacts are usually related to information effects, and have been interpreted as the change in market value associated with a large trade. We measure both price impacts using closing prices in the central market on the trading day after the block, since 38% of our trades are executed on off-trading hours and a further 35% are executed on the last hour of the trading session[9]. Therefore, for most of sampled transactions market participants received information on the executed block either after the closing of the exchange trading-day session or in the following morning opening session.

Let P_b denote the share's price in the block market and P_t is the closing price in the exchange central market. We define the temporary effect as $\ln(\frac{P_b}{P_{t+1}})$, where P_{t+1} is the closing price in the day after the block is executed.

To construct permanent price effects we need to control for inevitable leakage of information about the impending large transaction. As Keim - Madhavan (1996) have shown these effects may be reflected in downstairs market prices well in advance. The extent of pre-block price movement is, of course, an empirical matter. To account for these effects we compute three permanent price effects: $\frac{P_{t+1}-P_{t-1}}{P_{t-1}}$; $\frac{P_{t+1}-P_{t-6}}{P_{t-6}}$; $\frac{P_{t+1}-P_{t-20}}{P_{t-20}}$. All three measures of permanent returns have been adjusted with the OLS market model (see Brown-Warner (1985)). Market model parameters are estimated using both pre and post-event period data. We define the event period as the twenty days on either side of the block transaction date, and the market model is estimated over days t=-120, ..,-21, and +21, ..,+120, where day 0 is the block trade date. To take into consideration possible problems of nonsynchronous trading each regression was run using the Scholes-Williams (1977) procedure, and OLS coefficients are adjusted accordingly. We use the Value Weighted index (adjusted for cash dividends) as our proxy for general market movements [10]. As a further measure of the price impact of a block trade we also compute a post-block cumulative abnormal returns from day t=+2 to day t=+20. To test significance of average price impacts we compute the Z-statistics, following the

---

[9] This intraday pattern of block executions is a well-known empirical regularity. For example, Choe - McInish - Wood (1995) on NYSE trades and Riva (1996) for the Paris Bourse report similar evidence.

[10] Given that a large part of block trades in sample involves mid and small-cap stocks we also constructed an equally weighted market index with dividends re-invested as an alternative benchmark. The empirical results however did not change significantly.

methodology outlined in Dodd - Warner (1983), while to ascertain the significance of median values we use the Wilcoxon statistics.

Table 3 presents mean and median results for temporary, permanent and post-block price impacts for seller-initiated blocks. Results have been also partitioned by year and by block size quintile as defined in previous Tables 1 and 2.

The sales of large blocks show significant temporary price effects: the whole period mean temporary price impact is -1.63% (median -1%). This result can be compared with Keim - Madhavan (1996) findings on price effects of only upstairs block trades in NYSE, AMEX and NASDAQ small cap stocks. They find an overall significant mean of -2.84%, although NASDAQ trades exhibit a larger impact. The larger impact they find can be probably explained with the average smaller size of firms included in their sample. We also detect a strong association between temporary price impacts and block size. Both mean and median temporary price impacts monotonically increase with transaction size, and all estimates are highly significant. Furthermore, although there is some year-to-year variability in the estimated price impacts, their magnitude and their relationship with size appear to be quite similar and persistent. These findings are consistent with both theoretical models and previous empirical studies, and provide evidence of a strong short-term liquidity effect.

Seller-initiated blocks also show significant permanent effects. The three average estimates increase with length of time, varying from –1.4% for the two-day interval return, to -4.5% for the twenty-day time period. This pattern is consistent with central market price movements that gradually incorporate some information contained in the coming upstairs block. The economic value of permanent price impacts is relevant as well. For example, in the two-day interval its average impact is about 50.7m USD for the average company’s equity at the time of twenty days before block trade date. However there is a great deal of variability in these findings, in fact the median results are much lower (17.1m USD), although still highly significant. What is interesting to note is that there is a clear inverse relationship between permanent price effects of sell blocks and size of trades. Small blocks, which generally involve large firm’s stocks, experience the highest negative effects for all the pre-trade intervals. Plausibly, either large firms’ shares are easier to sell in the block market, or for those stocks institutional investors are more willing to trade a block after a persistent underperformance. We detect decreasing but significant price impacts up to the fourth block size class, whereas very large seller-initiated blocks (mainly executed on small firms’ shares) show insignificant effects on downstairs market prices. The pattern of permanent effects, however, is observed particularly for the first three years in sample. In 1995 and 1996, when the change in the central market trading system was completed and the upstairs market experienced a significant downsizing, we observe that most of permanent price effects are not significant. Finally, we also notice for the whole sample significant post-block price effects (both means and medians) for every size group. Post-block prices behaviour, however, shows a similar pattern to pre-trade intervals, with highly significant abnormal returns in the first three years and insignificant effects in the last two years in sample. Summing up all over the twenty-day pre-trade and post-trade cumulative abnormal returns, seller-initiated blocks produce a significant decline of almost 9% in downstairs market prices.

Overall, our findings for seller-initiated blocks suggest that both price pressure and liquidity costs are driving much of the observed market dynamics. The fact that a significant relationship between price effects and trade size is observed only for temporary impacts reinforces the importance of the two hypotheses to explain large sales of stocks, and cast some doubts on the information content of seller-initiated blocks. The inverse relationship we detect between permanent price effects and trade size, however, is consistent with the model of Keim - Madhavan (1996). If trade size is correlated with the amount of private information contained in a block trade, then our average seller-initiated transaction seems triggered by other motivations, consistent with the view that upstairs markets collect non-informational trades.

The results for buyer-initiated block are reported, in a similar fashion, in Table 4. Temporary effects of block purchases are large, statistically significant and strongly correlated to the size of trade. For the whole sample of five years we estimate a mean price reversal of 2.7%, but the median impact is small, not significant and even negative, suggesting that lot of variability distinguish buy-orders price impacts. A great deal of variance distinguishes also results for permanent effects. While the block-trade window shows a significant and positive impact of +0.69%, results for longer pre-block intervals are negative and significant. It appears that central market prices are falling during the 3-4 weeks that precede the block-date, then a rebound is observed around the trade execution. However, after the upstairs block is executed market prices continue to fall, as can be seen by the negative and significant post-block price effect. This price behaviour is not consistent across the years. While the results for the whole sample are confirmed for the first three years, 1992 to 1994, in the two remaining years the evidence is quite different. Temporary effects seem larger and pre-block abnormal returns are positive and increasing in magnitude with their time length. Furthermore, no post-block impact is observed during this two-year time. Summing up, the evidence presented for buyer-initiated blocks is not entirely clear. Surely, buy orders of large blocks exert a profound pressure on central market prices, but it appears that only in the last two years the directions of price effects is consistent with block price changes revealing private information. Our results are not in line with studies of the US upstairs market. First, we find a positive and significant temporary effect, which it's rarely observed in similar studies (see, e.g., Keim - Madhavan (1996)). Second, we find conflicting evidence on pre-trade price movements: only in the last two years in sample price behaviour seem more consistent with previous studies. The observed pattern of market prices in the pre-trade period can be explained by information effects and with brokers pushing the block prior to the actual execution. But these price movements around block trades could also arise if, for example, institutional investors are positive-feedback traders for buys but not for sells. As a result, they will buy block of shares more often when stock prices rises[11].

Quite surprisingly, we find no relationship between permanent impacts of block purchases and block size. Tables 4 shows that price effects increase when moving from the first to second class of blocks and successively decline. The observed non-linear relationship is in line with theoretical predictions developed by Keim - Madhavan (1996), and is also consistent with their evidence for the US upstairs market.

We then analyze the differences between price effects of buyer versus seller-initiated blocks. The absolute value of temporary price effect of buy orders is higher and significantly different than sell orders. Past studies of block trades have frequently observed different temporary effects for buyer- versus seller-initiated blocks. It has been found that while seller-initiated blocks induce significant temporary price effects, buyer-initiated blocks do not [see, e.g., Kraus - Stoll (1972), Ball - Finn (1989), Holthausen-Leftwich-Mayers (1990), Chan - Lakonishok (1993) and Keim - Madhavan (1996)]. Several hypotheses have been advanced to explain this asymmetric responses of market prices to block trades. Some authors argue that brokers reluctance to take short position to accommodate a block purchase results in a lack of intermediary involvement and no temporary effect for most buyer-initiated block trades [e.g., Holthausen-Leftwich-Mayers (1990) and Chan - Lakonishok (1993)][12]. Given the institutional setting of Italian market, we are inclined to doubt that brokerage firms were frequently shorting stocks just traded in the block market. As we already noticed, although security firms may act in dual-capacity, they were rarely committing their capital in the block market.

[11]Some studies have found that institutional investors typically buy past winners, but most do not systematically sell past losers. See, for example, Grinblatt-Titman-Wermers (1995).

[12] It is interesting to note that Lynch - Mendenhall (1997) document a significant temporary price effect for both additions and deletions of stocks in the Standard and Poor's 500 index. Also this evidence, as they suggest, casts

Furthermore, the absence of a derivative market to hedge systematic and firm risks for most of our sample period, raise further doubts that our results may be explained by arbitrage trading of security firms[13].

Keim - Madhavan (1996) also find that purchased blocks do not induce temporary price impacts. They argue that buyer-initiated block temporary effects may be subsumed into the permanent effects, and show that market prices drift upward after the trade date. They suggest that buyers may be informed agents, willing to continue to buy more shares in the central market. This explanation is not consistent with our data. From table 4 we observe that there is a significant downward movement of post-block prices, similar to what we find for sales of blocks. If anything, it seems that market prices after a large buy order tend slightly to decline. In summary, our findings are mostly consistent with price pressure and liquidity costs, which can be particularly high in a stock market populated by listed stocks with a limited free-float.

5.4 Price effects of block trades in different central market trading systems

In this section we address the issue of whether a different trading mechanism in the central market may change our results on block trade price effects. In table 5 we report price impacts of block trades from January 1992 to April 15th, 1994. During that period listed stocks in the Italian Exchange were gradually transferred from the floor based daily-call auction to the new electronic trading platform. After April 15, 1994 all listed stocks traded in the floor were moved to the electronic market. Table 5 presents our findings, partitioning results both for central market trading mechanism and by firm's market capitalisation, in order to control for possible size effects.

Table 5 shows that the central market trading mechanism is a significant factor in explaining our findings on block trade price effects. The mean temporary price impact for seller-initiated blocks executed on a share traded on the floor is significantly higher than the comparable impact on a stock traded in the electronic market. However, the same conclusion does not hold if we look into the median price impact.

Temporary price effects for buyer-initiated blocks present a more divergent pattern: while blocks executed on stocks traded in the floor show a consistent price reversal,

---

doubts on the explanation of block-trade asymmetry based on brokers reluctance to sell short shares included in large buy transactions usually observed at time of index changes.

[13] The Italian Derivative Market (IDEM) started its operation in November 1994, when a futures contract on the blue-chips index MIB30 was launched. Options on the same index started to trade one year later, and stock options on six large firms were listed on February 1996. Another possible explanation of the observed result is that major shareholders of listed shares were acting as dealers in buyer-initiated blocks and, as our findings show,

particularly for small and medium-cap firms, blocks executed on shares traded in the electronic market produce a small but significant price continuation. The mean price effect of the two groups is significantly different at any conventional levels.

The differences in the estimates of permanent price effects in the two central market trading mechanisms are less clear cut. We find some cases of significant differences but, on average, our results show that permanent impacts are about the same whatever the trading arrangement is adopted in the downstairs market. Our findings show, however, that liquidity and price pressure effects are significantly reduced when the downstairs trading mechanism moved from the daily-floor auction to the electronic continuous market. This result is consistent with the belief that improvements in trading mechanisms are valuable. For example, Amihud-Mendelson-Lauterbach (1997) show that stocks transferred to a more efficient trading method in the Tel Aviv Stock Exchange enjoyed a significant increase in market value, liquidity and in the price-discovery process. Here we show that a better central trading mechanism may reduce price impacts of off-exchange large transactions, leading to increase liquidity and reduce execution costs.

5.5 Regression analysis on the determinants of block price effects

In order to shed further light on the determinants of temporary and permanent effects of large transactions we perform a regression analysis. The regression analysis aims to test several hypotheses predicted by theoretical models that analyzed the price effects associated with large transactions [e.g. Burdett - O'Hara (1987), Grossman (1992), Keim-Madhavan (1996) and Seppi (1990)].

To this end we estimate the following regression model:

$$BPIMPACT_i = a + b_1 ROS + b_2 \ln MV_i + b_3 \sigma_i + b_4 DTS + b_5 Dyear92 + \ldots b_8 Dyear95 + e_i$$

where $BPIMPACT_i$ is either the temporary or the permanent price impact; ROS_i is our used definition of block size and it is measured as the Ratio of number of shares traded in the block transaction to total number of Outstanding Shares at day t=-21 or earlier; $\ln MV_i$ is the natural logarithm of stock' s market capitalization (in billions of Lire) at day t=-21 or earlier; σ_i is the stock's daily return standard deviation computed over the period t=-120,..,–21 and

consistently profiting. Although we cannot rule out this hypothesis, it's difficult to believe that major t=+21,..,+120; DTS is a dummy variable which equals 1 when central market trading was conducted in the electronic continuous market and zero when trading was in the floor-based daily call auction; $Dyear$ is a dummy variable for years 1992, 1993, 1994 and 1995. Both the effects of year 1996 and the floor-based call auction regime in the central market are captured from the intercept. Our time series cross sectional regression analysis has used both OLS standard procedure and Newey-West (1987) methodology in order to control for autocorrelation and heteroskedasticity effects. In table 6 we report both OLS standard errors and Newey-West (1987) consistent standard errors. Table 6 reports our results, separately for seller and buyer-initiated blocks.

The coefficient of trade size for temporary price impacts is negative (positive) and highly significant for sales (purchases). All the estimated coefficients have the expected sign, given that mean temporary effects are negative for sales and positive for purchases. This result confirms that trade size is a major determinant of liquidity costs to face in the block market. The effect of trade size on permanent price impacts, however, results in a more complex relationship. While for seller-initiated blocks we detect insignificant coefficients for the two pre-trade intervals, buyer-initiated blocks appear to produce smaller permanent effects for larger blocks. Although counterintuitive, this result is not new in the block trading literature. For example, Keim - Madhavan (1996) found similar evidence, suggesting that both the identity and trading motivation of the block initiator may produce such anomalous effects. As we noticed above, permanent effects of buy blocks increase up to mid-size blocks and then gradually decline for very large trades. We cannot exclude that large buyer-initiated blocks can be associated with corporate control events and therefore their associated price impacts depend in part on the blockholder's specific skills and not just on the fraction of firm's shares acquired [see, e.g., Barclay - Holderness (1991].

Turning to the effect of market capitalisation we find that there is a significant inverse relationship between price impacts and the market value of listed shares in all cases. Note that for temporary impacts of seller-initiated blocks the sign is consistent, since the mean temporary price impact of those trades is negative. This result also supports the view of stocks possessing downward-sloping demand curves. Specifically, price effects associated with block execution increase significantly for smaller and less traded stocks. This evidence confirms that firm's demand elasticity decreases as we move from large firms to less liquid stocks.

---

shareholders were continually selling large chunk of shares in the block market.

The results for firm-specific volatility show that in most cases there is a significant inverse relationship between price impacts and stock's return variance. Although we cannot rule out that single stock's volatility could be not properly estimated, we tend to explain this counterintuitive finding as capturing some unknown variable linked to the upstairs pricing process. Finally, the estimated coefficients for dummies on the impact of central market trading regime give further support to the conclusions reached in section 5.4. Block trading price effects are significantly lower when shares trade in the continuous electronic market, making the floor-based daily call market a less efficient trading mechanism to cope with price pressure observed around block execution.

5.6 Block price effects and trade size: additional tests

What is the best variable to analyse the relationship between trade size and the price effects of block transactions? Several past empirical studies dealt with this issue, reaching no clear conclusions. Given the relevance of the estimated relationship between price effects and trade size to test predictions of theoretical models, in this section we provide some additional tests to examine the robustness of previous results.

First, in order to detect possible problems of non-linearity, already highlighted in previous summary statistics, we run separate regressions adding the variable $ROS^2{}_i$ and also $ROS^3{}_i$. The non-linear estimates resulted significant only for buyer-initiated blocks, but the b_1 coefficient remained negative and significant. We next investigate whether different measures of block size may explain our previous findings. We collected three further measures of block size: a) the log transformation of size variable ROS; b) the number of shares traded in the block, scaled by the stock's average daily volume during the 25-day period from day –45 through day –21, where day 0 is the block trade date (termed as RNV); and c) the log transformation of the size variable RNV. We then re-run our regression models with each different size variable and again, we find a significant relationship in all cases between temporary effects and block size, but no reliable evidence of a positive relationship between permanent price impacts and block size. Thus, different definitions of block size confirm that larger trades increase temporary price effects, whereas either they are not related to permanent effects for sell orders or they reduce permanent impacts of buyer-initiated blocks.

Finally, we performed regression analyses for sample sub-groups according to our four alternative definitions of block trade size. Table 7 reports summary results of parameter estimates of trade size variables from our regression model [1] and, to avoid overburdening the reader with many numbers, the remaining estimated parameters are not reported. Furthermore, in Table 7 we sort block data by trade size defined as a fraction of outstanding shares (ROS); results for data sorted with other definitions of block size are essential the same and are not reported for the sake of brevity. Inspection of Table 7 reveals that whatever definition of block size we use, there is at most very weak evidence that trade size is an important determinant of upstairs trading price effects. For most of regressions, both for sell and buy orders, the estimated coefficients are either not significant or if they are, they have the wrong sign. Our robustness check confirms that block trade price impacts are probably driven by other factors than private information, with liquidity costs and no-elastic demand explanations as the more prominent candidates to have the role of main determinants. However, another interpretation may view block size as not a proper variable to reveal whether a block is/or is not information motivated. For instance, Seppi (1990, 1992) has suggested that other trade characteristics may be important (e.g., investor urgency, reputation) in the process of information revelation, and that block size may be a very noise proxy to reveal whether blocks are driven by private information.

6. CONCLUSIONS

This paper offers an empirical analysis of price effects of block trading in the Italian Exchange. Large-block trades of Italian listed shares are executed off-exchange with no interaction rules and a 60-minute disclosure time. Our sample embraces a period where listed shares migrated gradually from the floor-based daily call auction to the electronic continuous trading system. In the meanwhile off-exchange block trades gradually declined, and they remained a viable trading option only for mid and small-cap stocks.

We find that upstairs block trading induces significant temporary and permanent effects. Our results show that temporary effects are significantly related to trade size, consistent with price pressure and liquidity costs explanations of block trading. Another possible interpretation of our study is that demand for the firm’s shares is not perfectly elastic. Given the tight ownership structure of listed Italian companies, a large purchase/sell of shares removes/adds a substantial fraction of the firm’s outstanding shares from the market, causing the market price to adjust to a new level.

Our finding, however, are inconsistent with block trades being information motivated. We find no evidence that permanent price effects are significantly related to trade size, as some theoretical model of information trading would predict.

The analysis raises the question of why investors and traders may still direct their transactions to the upstairs market, given the high trading costs they must incur. Presumably, the low liquidity of the typical stock in our sample is forcing traders to face such high implicit trading costs because no other trading mechanism can absorb large transactions. Our study shows how an upstairs market may evolve when the central market trading system improve in depth and liquidity. Large blocks directed to the off-exchange upstairs market remained a viable option only for small and medium size stocks, and we interpreted the observed price impacts as a further evidence of the importance of noninformational liquidity events that may affect significantly and permanently firms' market valuation.

REFERENCES

Amihud Y. - Mendelson H. - Lauterbach B. (1997), Market microstructure and securities values: evidence from the Tel Aviv Stock Exchange, *Journal of Financial Economics*, 45, pp. 365-390.

Ball R. - Finn F.J. (1989), The effects of block transactions on share prices: Australian evidence, *Journal of Banking and Finance*, 13, pp. 397-419.

Barclay M.J. - Holderness C.G. (1991), Negotiated block trades and Corporate Control, *Journal of Finance*, 46, pp. 861-878.

Barclay M.J. - Warner J.B. (1993), Stealth trading and volatility, *Journal of Financial Economics*, 34, pp. 281-305.

Brown S. - Warner J.B. (1985), Using daily stock returns: the case of event studies, *Journal of Financial Economics*, 14, pp. 3-31.

Burdett K. - O'Hara M. (1987), Building blocks: an introduction to block trading, *Journal of Banking and Finance*, 11, pp. 193-212.

Dodd P. - Warner J.B. (1983), On corporate governance. A study of proxy contests, *Journal of Financial Economics*, 11, pp. 401-438.

Chan L.K.C. - Lakonishok J. (1997), Institutional equity trading costs: NYSE versus NASDAQ, *Journal of Finance*, 52, pp. 713-735.

Chan L.K.C. - Lakonishok J. (1995), The behavior of stock prices around institutional trades, *Journal of Finance*, 50, pp. 1147-1174.

Chan L.K.C. - Lakonishok J. (1993), Institutional trades and intraday stock price behavior, *Journal of Financial Economics*, 33, pp. 173-199.

Choe H. - McInish T.H. - Wood R.A. (1995), Block versus nonblock trading patterns, *Review of Quantitative Finance and Accounting*, 5, pp. 355-363.

Dann L. - Mayers D. - Raab R.J. Jr. (1977), Trading rules, large blocks and the speed of price adjustment, *Journal of Financial Economics*, 4, pp. 3-22.

Dhillon U. - Johnson H. (1991), Changes in the Standard and Poor's 500 List, *Journal of Business*, 64, pp. 75-85.

Easley D. - O'Hara M. (1987), Price, Trade size, and information in securities markets, *Journal of Financial Economics*, 19, pp. 69-90.

Edelen R.M. (1999), Investor flows and the assessed performance of open-end mutual funds, *Journal of Financial Economics*, 53, pp. 439-466.

Gemmill G. (1996), Transparency and liquidity: a study of block trades on the London Stock Exchange under different publication rules, *Journal of Finance*, 51, pp. 1765-1790.

Grinblatt M. - Titman S. - Wermers R. (1995), Momentum investment strategies, portfolio performance, and herding: a study of mutual fund behavior, *American Economic Review*, 85, pp. 1088-1105.

Grossman S.J. (1992), The informational role of upstairs and downstairs trading, *Journal of Business*, 65, pp. 509-528.

Harris L - Gurel E. (1986), Price and volume effects associated with changes in the S&P 500 list: new evidence for the existence of price pressures, *Journal of Finance,* 41, pp. 815-829.

Holthausen R.W. - Leftwich R.W. - Mayers D. (1987), The effect of large block transactions on security prices: a cross-sectional analysis, *Journal of Financial Economics*, 19, pp. 237-267.

Holthausen R.W. - Leftwich R.W. - Mayers D. (1990), Large block transactions, the speed of response, and temporary and permanent stock-price effects, *Journal of Financial Economics*, 26, pp. 71-95.

Keim D.B. - Madhavan A. (1997), Transaction costs and investment style: an inter-exchange analysis of institutional equity trades, *Journal of Financial Economics*, 46, pp. 265-292.

Keim D.B. - Madhavan A. (1996), The upstairs market for large-block transactions: analysis and measurement of price effects, *Review of Financial Studies*, 9, pp. 1-36.

Keim D.B. - Madhavan A. (1995), Anatomy of the trading process: empirical evidence on the behavior of institutional traders, *Journal of Financial Economics*, 37, pp. 371-398.

Kraus A. - Stoll H. (1972), Price impacts of block trading on the New York Stock Exchange, *Journal of Finance,* 27, pp. 569-588.

Kyle A. (1985), Continuous auction and insider trading, *Econometrica*, 50, pp. 1315-1335.

LaPlante M. - Muscarella C.J. (1997), Do institutions receive comparable execution in the NYSE and NASDAQ markets? A transaction study of block trades, *Journal of Financial Economics*, 45, pp. 97-134.

Lee C.M.C. - Ready M.J. (1991), Inferring trade direction from intraday data, *Journal of Finance*, 46, pp. 733-746.

Loderer C. - Cooney J.W. - Van Drunen L.D. (1991), The price elasticity of demand for common stock, *Journal of Finance,* 46, pp. 621-651.

Lynch A.W. - Mendenhall R.R. (1997), New evidence on stock price effects associated with changes in the S&P 500 index, *Journal of Business,* 70, pp. 351-383.

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

Martinez M.A. - Tapia M. - Yzaguirre J. (1999), Information transmission around block trades on the Spanish Stock Exchange, Working Paper Universidad del Pais Vasco, January.

Michaely R. - Murgia M. (1995), The effect of tax heterogeneity on prices and volume around the ex-dividend day: evidence from the Milan Stock Exchange, *Review of Financial Studies*, 8, pp. 369-399.

Mikkelson W.H. - Partch M.M. (1985), Stock price effects and costs of secondary distributions, *Journal of Financial Economics*, 14, pp. 165-194.

Newey W.K. - West K.D. (1987), A simple positive definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica*, 55, pp. 703-705.

Pagano M. (1989), Trading volume and asset liquidity, *Quarterly Journal of Economics*, 104, pp. 255-274.

Pagano M. - Roell A. (1996), Transparency and liquidity: A comparison of auction and dealer markets with informed trading, *Journal of Finance*, 51, pp. 579-611.

Riva F. (1996), Block trading on the Paris Bourse central market: an empirical study, Universite' Paris IX Dauphine, December.

Scholes M. (1972), The market for securities: substitution versus price pressure and the effects of information on share prices, *Journal of Business*, 45, pp. 179-211.

Scholes M. - Williams J. (1977), Estimating betas from nonsynchronous data, *Journal of Financial Economics,* 5, pp. 309-327.

Seppi D.J. (1990), Equilibrium block trading and asymmetric information, *Journal of Finance*, 45, pp. 73-94.

Seppi D.J. (1992), Block trading and information revelation around quarterly earnings announcements, *Review of Financial Studies*, 5, pp. 281-305.

Shleifer A. (1986), Do demand curves for stocks slope down? *Journal of Finance*, 41, pp. 579-590.

The Economist (1999), Good-bye to all that, January 30, pp. 81-82.

TABLE 1

Summary statistics for Seller-initiated block trades of Italian common stocks for the period January 1992 to December 1996.

The table presents summary statistics for seller-initiated block trades of Italian common stocks during the five-year period from January 1992 to December 1996. Number of block trades; mean and (median) number of shares traded (thousands of shares); mean and (median) block size measured by number of shares traded as a percent of the total number of shares outstanding; mean and (median) value (millions of US dollars) of block trades; mean and (median) market capitalization (millions of US dollars) for the traded stocks. For each year in sample block trades have been classified according to block size and divided into quintiles. US dollar values of block trade and market capitalization have been computed using the Bank of Italy's official daily exchange rates.

YEAR	STATISTICS Mean (Median)	BLOCK SIZE					TOTAL SAMPLE
		1. Small (<0.025%)	2. (0.025%-<0.1%)	3. (0.1%-<0.3%)	4. (0.3%-<2%)	5. Large (= > 2%)	
1992	Number of blocks	344	557	368	427	46	1742
	Number of shares traded ('000s)	760 (245)	973 (280)	825 (280)	871 (280)	1089 (240)	877 (270)
	Block Size (%)	0.015 (0.016)	0.052 (0.046)	0.177 (0.167)	0.817 (0.658)	4.552 (2.941)	0.376 (0.092)
	Value of block trades ($ million)	0.577 (0.480)	0.958 (0.660)	2.703 (1.445)	5.224 (1.930)	7.705 (4.580)	2.466 (0.860)
	Market Capitalization ($ million)	5204 (3619)	2005 (1603)	1669 (888)	838 (268)	264 (132)	2245 (1373)
1993	Number of blocks	402	438	266	277	30	1413
	Number of shares traded ('000s)	1176 (300)	1307 (310)	1270 (360)	1244 (350)	1085 (280)	1246 (325)
	Block Size (%)	0.013 (0.013)	0.050 (0.044)	0.176 (0.160)	0.747 (0.576)	6.538 (3.500)	0.342 (0.059)
	Value of block trades ($ million)	0.775 (0.600)	1.051 (0.610)	3.063 (1.750)	5.943 (2.890)	11.649 (4.400)	2.547 (0.845)
	Market Capitalization ($ million)	7325 (5513)	2363 (1564)	1821 (1031)	1101 (427)	241 (126)	3379 (1691)
1994	Number of blocks	585	536	244	221	26	1612
	Number of shares traded ('000s)	609 (250)	675 (250)	935 (250)	674 (290)	501 (250)	687 (250)
	Block Size (%)	0.011 (0.010)	0.052 (0.046)	0.170 (0.156)	0.773 (0.652)	6.008 (3.228)	0.253 (0.04)
	Value of block trades ($ million)	0.830 (0.630)	1.629 (0.770)	3.937 (1.275)	4.761 (1.320)	7.532 (4.530)	2.216 (0.770)
	Market Capitalization ($ million)	9030 (7311)	3371 (1812)	2380 (826)	868 (213)	146 (110)	4876 (2601)
1995	Number of blocks	15	157	101	85	7	365
	Number of shares traded ('000s)	2012 (260)	2359 (220)	4079 (330)	1961 (330)	4480 (290)	2778 (300)
	Block Size (%)	0.019 (0.020)	0.060 (0.062)	0.173 (0.164)	0.591 (0.449)	4.264 (3.529)	0.315 (0.113)
	Value of block trades ($ million)	1.613 (0.980)	1.857 (0.700)	1.560 (0.580)	3.134 (1.140)	3.527 (3.870)	2.102 (0.800)
	Market Capitalization ($ million)	8506 (5691)	3782 (1471)	999 (381)	529 (232)	110 (108)	2366 (830)
1996	Number of blocks	45	185	161	121	20	532
	Number of shares traded ('000s)	1111 (425)	1133 (350)	2330 (250)	10091 (250)	3867 (490)	3605 (320)
	Block Size (%)	0.017 (0.016)	0.052 (0.048)	0.191 (0.182)	0.643 (0.501)	11.298 (3.146)	0.677 (0.139)
	Value of block trades ($ million)	2.765 (3.235)	1.926 (1.155)	2.422 (0.600)	4.135 (1.550)	35.610 (6.510)	4.002 (1.100)
	Market Capitalization ($ million)	17551 (14578)	4380 (2153)	1602 (286)	845 (244)	612 (154)	3766 (1037)
ALL YEARS 1992-1996	Number of blocks	1391	1873	1140	1131	129	5664
	Number of shares traded ('000s)	842 (250)	1097 (290)	1452 (300)	1995 (300)	1645 (270)	1297 (290)
	Block Size (%)	0.013 (0.013)	0.052 (0.047)	0.177 (0.167)	0.755 (0.602)	6.366 (3.156)	0.358 (0.070)
	Value of block trades ($ million)	0.825 (0.590)	1.343 (0.700)	2.908 (1.190)	5.039 (1.805)	12.807 (4.585)	2.539 (0.830)
	Market Capitalization ($ million)	7862 (5169)	2864 (1646)	1787 (781)	886 (262)	281 (126)	3423 (1564)

TABLE 2

Summary statistics for Buyer-initiated block trades of Italian common stocks for the period January 1992 to December 1996.

The table presents summary statistics for buyer-initiated block trades of Italian common stocks during the five-year period from January 1992 to December 1996. Number of block trades; mean and (median) number of shares traded (thousands of shares); mean and (median) block size measured by number of shares traded as a percent of the total number of shares outstanding; mean and (median) value (millions of US dollars) of block trades; mean and (median) market capitalization (millions of US dollars) for the traded stocks. For each year in sample block trades have been classified according to block size and divided into quintiles. US dollar values of block trade and market capitalization have been computed using the Bank of Italy's official daily exchange rates.

YEAR	STATISTICS Mean (Median)	BLOCK SIZE 2. Small (<0.025%)	2. (0.025%-<0.1%)	3. (0.1%-<0.3%)	4. (0.3%-<2%)	5. Large (= > 2%)	TOTAL SAMPLE
	Number of blocks	325	460	228	223	29	1265
	Number of shares traded ('000s)	940 (250)	1132 (310)	1228 (295)	961 (260)	903 (300)	1064 (270)
1992	Block Size (%)	0.015 (0.016)	0.050 (0.044)	0.168 (0.155)	0.735 (0.563)	6.202 (3.500)	0.321 (0.057)
	Value of block trades ($ million)	0.600 (0.500)	0.871 (0.530)	1.716 (0.830)	3.512 (1.570)	22.307 (3.710)	1.898 (0.640)
	Market Capitalization ($ million)	4945 (3554)	1774 (1327)	1018 (526)	508 (205)	202 (87)	2199 (1285)
	Number of blocks	551	498	205	220	28	1502
	Number of shares traded ('000s)	1232 (300)	1052 (300)	795 (250)	934 (240)	560 (250)	1054 (280)
1993	Block Size (%)	0.013 (0.012)	0.053 (0.048)	0.172 (0.157)	0.751 (0.632)	9.155 (4.184)	0.342 (0.043)
	Value of block trades ($ million)	0.753 (0580)	1.293 (0.630)	2.431 (1.140)	5.268 (2.260)	19.670 (4.240)	2.209 (0.720)
	Market Capitalization ($ million)	7333 (5555)	2652 (1374)	1383 (750)	869 (291)	181 (66)	3863 (1786)
	Number of blocks	824	645	245	182	24	1920
	Number of shares traded ('000s)	698 (200)	911 (250)	704 (250)	925 (200)	1142 (285)	797 (230)
1994	Block Size (%)	0.011 (0.01)	0.053 (0.048)	0.170 (0.161)	0.776 (0.563)	7.905 (3.230)	0.217 (0.034)
	Value of block trades ($ million)	0.815 (0.610)	1.192 (0.690)	1.994 (0.890)	5.779 (1.665)	27.545 (11.285)	1.897 (0.700)
	Market Capitalization ($ million)	8960 (7887)	2310 (1537)	1203 (562)	832 (282)	356 (163)	4856 (2530)
	Number of blocks	17	186	174	123	31	531
	Number of shares traded ('000s)	429 (200)	3537 (255)	1211 (245)	2807 (440)	2880 (500)	2468 (300)
1995	Block Size (%)	0.017 (0.017)	0.057 (0.057)	0.183 (0.180)	0.829 (0.720)	10.373 (3.999)	0.878 (0.142)
	Value of block trades ($ million)	2.179 (2.850)	1.528 (0.825)	1.443 (0.510)	11.316 (1.800)	91.602 (47.78)	9.047 (0.880)
	Market Capitalization ($ million)	12930 (17761)	3024 (1227)	772 (276)	1115 (253)	1235 (401)	2056 (834)
	Number of blocks	29	231	159	96	14	529
	Number of shares traded ('000s)	1366 (1000)	1333 (250)	1577 (300)	1583 (500)	1380 (300)	1456 (300)
1996	Block Size (%)	0.016 (0.016)	0.055 (0.054)	0.168 (0.157)	0.748 (0.517)	8.319 (10.000)	0.445 (0.105)
	Value of block trades ($ million)	3.235 (3.445)	2.170 (0.810)	2.601 (0.670)	3.721 (1.330)	5.624 (5.210)	2.741 (0.925)
	Market Capitalization ($ million)	21408 (18103)	4586 (1579)	1887 (413)	541 (187)	62 (71)	3841 (968)
	Number of blocks	1746	2020	1011	844	126	5747
ALL YEARS	Number of shares traded ('000s)	920 (250)	1284 (265)	1066 (250)	1283 (250)	1392 (330)	1138 (250)
1992-1996	Block Size (%)	0.013 (0.012)	0.053 (0.048)	0.172 (0.159)	0.763 (0.592)	8.459 (3.999)	0.354 (0.054)
	Value of block trades ($ million)	0.809 (0.590)	1.285 (0.655)	2.023 (0.790)	5.592 (1.720)	37.244 (6.395)	2.710 (0.710)
	Market Capitalization ($ million)	7932 (5451)	2595 (1396)	1233 (494)	761 (247)	456 (98)	3652 (1540)

TABLE 3

The price impacts for Seller-initiated block trades of Italian common stocks

The table presents results of the price impacts for seller-initiated block trades of Italian common stocks in the period January 1992 to December 1996. The temporary price impact is computed as the percentage price change between the negotiated block price and the closing price on the day following the block trade. The permanent price impact is computed as the percentage price change between the closing price on the day following the block trade and the closing price on the *n*th day preceding the block date. The post-block price effect is computed as the percentage price change from day t=+2 to day t=+20. Permanent and post-block price effects are adjusted with the OLS market model using the Italian value weighted market index. Regression parameters are estimated using the Scholes-Williams (1977) procedure from t=-120,..to -21, and from t=+21,..to +120 where t=0 is the block trade date. Test of significance for the mean price impacts (Z-test) are calculated from standardized abnormal returns employing the Dodd-Warner (1983) procedure: * denotes a level of significance $\leq 5\%$. Test of significance for the median price impacts are calculated using the Wilcoxon statistics: # denotes a level of significance $\leq 5\%$. For each year in sample, block trades have been classified according to block size and divided into quintiles (see also table 1 for corresponding summary statistics).

YEAR	PRICE IMPACTS Mean (Median) in % and Tests of Significance	BLOCK SIZE 1. Small (<0.025%)	2. (0.025%-<0.1%)	3. (0.1%-<0.3%)	4. (0.3%-<2%)	5. Large (= > 2%)	TOTAL SAMPLE
1992	**Temporary Price impact**	-0.567 (-0.374)	-0.410 (-0.094)	-1.616* (-0.878 #)	-0.963* (-0.620 #)	-1.164 (-0.751)	-0.851* (-0.453 #)
	Permanent Price impact (t-1 to t+1)	-1.919* (-1.116 #)	-1.584* (-1.076 #)	-0.860* (-0.213 #)	-1.183* (-0.595 #)	-0.208 (0.167)	-1.363* (-0.719 #)
	Permanent Price impact (t-6 to t+1)	-2.834* (-1.321 #)	-1.348* (-0.960 #)	-0.866 (-0.107)	-1.230* (-1.156 #)	-0.823 (0.485)	-1.497* (-0.716 #)
	Permanent Price impact (t-20 to t+1)	-4.762* (-2.809 #)	-2.703* (-1.071 #)	-3.364* (-1.648 #)	-2.106* (-1.162 #)	0.889 (2.640)	-3.008* (-1.368 #)
	Post-block price effect (t+2 to t+20)	-2.517* (-1.028 #)	-2.247* (-1.912 #)	-3.601* (-2.371 #)	-3.731* (-3.378 #)	-3.732 (-4.713)	-2.989* (-2.059 #)
1993	**Temporary Price impact**	-0.930* (-0.783 #)	-2.372 *(-1.690 #)	-3.555* (-2.834 #)	-3.666* (-2.748 #)	-5.991* (-6.077 #)	-2.515 *(-1.743 #)
	Permanent Price impact (t-1 to t+1)	-2.648* (-1.818 #)	-1.967* (-1.136 #)	-1.211* (-0.875 #)	-1.776* (-1.241 #)	-0.843 (-0.125)	-1.957* (-1.299 #)
	Permanent Price impact (t-6 to t+1)	-4.035* (-3.032 #)	-2.931* (-2.371 #)	-2.365* (-1.569 #)	-3.355* (-2.643 #)	-1.237 (-1.830)	-3.186* (-2.485 #)
	Permanent Price impact (t-20 to t+1)	-7.633* (-5.886 #)	-7.077* (-5.638 #)	-7.171* (-6.099 #)	-8.247* (-8.104 #)	-5.433* (-3.778 #)	-7.448* (-6.298 #)
	Post-block price effect (t+2 to t+20)	-5.842* (-4.973 #)	-7.354* (-6.062 #)	-7.446* (-6.921 #)	-6.808* (-6.999 #)	-2.514 (-4.242)	-6.732* (-5.817 #)
1994	**Temporary Price impact**	-0.867* (-0.495 #)	-1.416* (-1.178 #)	-1.829* (-1.762 #)	-5.187* (-3.248 #)	-7.529* (-6.116 #)	-1.895* (-1.348 #)
	Permanent Price impact (t-1 to t+1)	-1.725* (-1.289 #)	-1.577* (-1.170 #)	-1.888* (-1.641 #)	-1.095* (-1.478 #)	0.532 (0.176)	-1.578* (-1.289 #)
	Permanent Price impact (t-6 to t+1)	-2.941* (-2.085 #)	-2.747* (-2.474 #)	-3.757* (-3.898 #)	-2.249* (-3.129 #)	-0.326 (0.336)	-2.863* (-2.541 #)
	Permanent Price impact (t-20 to t+1)	-6.458* (-4.173 #)	-6.770* (-4.561 #)	-9.165* (-8.187 #)	-6.305* (-8.395 #)	-4.827 (-0.217)	-6.924* (-4.850 #)
	Post-block price effect (t+2 to t+20)	-4.249* (-1.818 #)	-6.249* (-4.409 #)	-9.272* (-10.004 #)	-9.238* (-9.429 #)	-9.126* (-10.069 #)	-6.437* (-4.497 #)

TABLE 3 *Continued*

YEAR	PRICE IMPACTS Mean (Median) in % and Tests of Significance	BLOCK SIZE 1. Small (<0.025%)	2. (0.025%-<0.1%)	3. (0.1%-<0.3%)	4. (0.3%-<2%)	5. Large (= > 2%)	TOTAL SAMPLE
1995	**Temporary Price impact**	0.264 (0.810)	-0.097 (-0.293)	-0.953 (-0.424 #)	-0.320 (-0.356)	-7.202 (-3.775 #)	-0.507* (-0.368 #)
	Permanent Price impact (t-1 to t+1)	-0.802(-1.866)	-0.417(-0.597 #)	-1.851*(-0.934 #)	-1.428*(-0.642 #)	1.457(0.894)	-1.029* (-0.750 #)
	Permanent Price impact (t-6 to t+1)	-1.394(-1.049)	0.243(0.060)	-0.747(-0.406)	-0.849(-0.167)	2.514(3.560)	-0.309(-0.064)
	Permanent Price impact (t-20 to t+1)	-0.095(-0.776)	0.348(-0.200)	-0.239(-0.407)	-0.808(-0.447)	3.546(0.831)	-0.040(-0.383)
	Post-block price effect (t+2 to t+20)	-4.072(-0.249)	0.040(0.042)	-1.262(-1.187)	0.999(-1.438)	1.020(-3.699)	-0.247(-0.862)
1996	**Temporary Price impact**	-0.752*(-0.232)	-0.197 (-0.554)	-2.290* (-1.215 #)	-2.697* (-1.490 #)	-11.621 (-6.944 #)	-1.876* (-0.689 #)
	Permanent Price impact (t-1 to t+1)	-0.623(-0.223)	-1.132*(-1.261 #)	-0.177(-0.903 #)	-0.555(-1.217 #)	-0.350(-1.315 #)	-0.639* (-1.145 #)
	Permanent Price impact (t-6 to t+1)	-1.070(0.034)	-1.010*(-0.887 #)	0.470(0.277)	-0.007(0.552)	0.843(0.786)	-0.269(-0.106)
	Permanent Price impact (t-20 to t+1)	-1.180(-1.300)	-0.478(-1.997)	4.006(3.226 #)	3.548(1.231)	4.019(4.078)	1.904(0.100)
	Post-block price effect (t+2 to t+20)	-0.772(0.330)	0.466(1.271 #)	0.340(0.353)	3.985(2.591 #)	1.737(1.146)	1.171(1.021 #)
ALL YEARS 1992-1996	**Temporary Price impact**	-0.795* (-0.547 #)	-1.109* (-0.756 #)	-2.150* (-1.385 #)	-2.588* (-1.683 #)	-5.518* (-2.817 #)	-1.637* (-1.013 #)
	Permanent Price impact (t-1 to t+1)	-1.994* (-1.320 #)	-1.529* (-1.127 #)	-1.153* (-0.807 #)	-1.262* (-1.069 #)	-0.138 (0.016)	-1.483* (-1.095 #)
	Permanent Price impact (t-6 to t+1)	-3.153* (-2.085 #)	-1.952* (-1.235 #)	-1.635* (-0.938 #)	-1.790* (-1.512 #)	-0.380 (-0.018)	-2.115* (-1.449 #)
	Permanent Price impact (t-20 to t+1)	-6.139* (-3.930 #)	-4.414* (-2.744 #)	-4.176* (-2.787 #)	-3.728* (-3.182 #)	-1.104 (-0.460)	-4.577* (-3.129 #)
	Post-block price effect (t+2 to t+20)	-4.167* (-2.426 #)	-4.127* (-2.435 #)	-4.948* (-3.440 #)	-4.380* (-3.533 #)	-3.430* (-3.675 #)	-4.337* (-2.893 #)

TABLE 4

The price impacts for Buyer-initiated block trades of Italian common stocks

The table presents results of the price impacts for buyer-initiated block trades of Italian common stocks in the period January 1992 to December 1996. The temporary price impact is computed as the percentage price change between the negotiated block price and the closing price on the day following the block trade. The permanent price impact is computed as the percentage price change between the closing price on the day following the block trade and the closing price on the *n*th day preceding the block date. The post-block price effect is computed as the percentage price change from day t=+2 to day t=+20. Permanent and post-block price effects are adjusted with the OLS market model using the Italian value weighted market index. Regression parameters are estimated using the Scholes-Williams (1977) procedure from t=-120,..to -21, and from t=+21,..to +120, where t=0 is the block trade date. Test of significance for the mean price impacts (Z-test) are computed from standardized abnormal returns employing the Dodd-Warner (1983) procedure: * denotes a level of significance $\leq$ **5%.** Test of significance for the median price impacts are calculated using the Wilcoxon statistics: # denotes a level of significance $\leq$ **5%.** For each year in sample, block trades have been classified according to block size and divided into quintiles (see also table 2 for corresponding summary statistics).

YEAR	PRICE IMPACTS Mean (Median) in % and Tests of Significance	BLOCK SIZE					TOTAL SAMPLE
		1. Small (<0.025%)	2. (0.025%-<0.1%)	3. (0.1%-<0.3%)	4. (0.3%-<2%)	5. Large (= > 2%)	
1992	**Temporary Price impact**	0.233 (-0.243)	1.643* (-0.140)	4.866* (0.768 #)	8.434* (2.221 #)	44.85* (13.136 #)	4.049* (0.393#)
	Permanent Price impact (t-1 to t+1)	0.263 (0.142)	0.795* (0.753 #)	0.042 (0.049)	-0.326 (-0.131)	0.255 (0.907)	0.313* (0.293 #)
	Permanent Price impact (t-6 to t+1)	-0.560 (-0.354)	-0.507 (-0.483)	-1.099* (-1.187 #)	-1.271* (-1.180 #)	-2.115 (-2.820)	-0.799* (-0.682 #)
	Permanent Price impact (t-20 to t+1)	-1.727* (-1.169 #)	-1.497* (-0.242)	-3.787* (-2.678 #)	-3.795* (-3.139 #)	-3.787 (-1.244)	-2.427* (-1.470 #)
	Post-block Price effect (t+2 to t+20)	-2.441* (-0.629 #)	-3.120* (-1.255 #)	-4.916* (-4.220 #)	-3.972* (-2.995 #)	-8.204* (-8.839 #)	-3.536* (-2.089 #)
1993	**Temporary Price impact**	-0.105 (-0.800 #)	1.811 (-0.578)	3.276* (-0.474)	9.702* (1.188 #)	45.08* (9.996 #)	3.271* (-0.499)
	Permanent Price impact (t-1 to t+1)	0.400 (0.442 #)	0.219 (-0.066)	1.142* (0.609)	-0.491 (-0.208)	0.225(-0.449)	0.308 (0.218 #)
	Permanent Price impact (t-6 to t+1)	-0.814* (-0.305 #)	-0.925* (-0.709 #)	0.321 (-0.145)	-2.117* (-1.848 #)	0.981 (-3.133)	-0.853* (-0.630 #)
	Permanent Price impact (t-20 to t+1)	-3.362* (-2.079 #)	-4.892* (-3.684 #)	-3.148* (-2.782 #)	-5.809* (-3.889 #)	5.427 (-4.417 #)	-4.035* (-2.917 #)
	Post-block Price effect (t+2 to t+20)	-4.910* (-3.305 #)	-5.333* (-4.116 #)	-4.735* (-3.593 #)	-6.169* (-4.669 #)	0.109 (-7.144 #)	-5.117* (-3.758 #)
1994	**Temporary Price impact**	-0.466* (-0.672 #)	-0.413 (-0.835 #)	0.571(-0.737 #)	4.388* (0.656 #)	16.87* (7.711 #)	0.361 (-0.578)
	Permanent Price impact (t-1 to t+1)	0.168 (-0.011)	0.972* (0.672 #)	0.679 (0.535)	0.211 (0.176)	-0.619 (-1.945)	0.498* (0.316 #)
	Permanent Price impact (t-6 to t+1)	-1.263* (-0.757 #)	-0.396* (-0.279 #)	-0.950* (-1.480 #)	-1.901* (-2.107 #)	-3.466* (-5.240 #)	-1.020* (-0.757 #)
	Permanent Price impact (t-20 to t+1)	-3.779* (-2.315 #)	-4.647* (-3.625 #)	-5.576* (-2.571 #)	-5.119* (-4.250 #)	-13.136* (-19.477 #)	-4.544* (-2.957 #)
	Post-block Price effect (t+2 to t+20)	-3.493* (-1.516 #)	-5.232* (-3.506 #)	-8.086* (-6.975 #)	-8.390* (-8.822 #)	-12.010* (-12.861 #)	-5.234* (-2.797 #)

TABLE 4 *Continued*

YEAR	PRICE IMPACTS Mean (Median) in % and Tests of Significance	BLOCK SIZE 1. Small (<0.025%)	2. (0.025%-<0.1%)	3. (0.1%-<0.3%)	4. (0.3%-<2%)	5. Large (= > 2%)	TOTAL SAMPLE
1995	**Temporary Price impact**	0.115 (0.649)	1.800* (-0.216)	2.755* (0.097)	14.89* (3.631 #)	23.35* (17.794 #)	6.351* (0.606 #)
	Permanent Price impact (t-1 to t+1)	0.823(0.102)	5.008* (1.365 #)	1.509* (1.098 #)	0.982(0.250)	-0.353(-0.605 #)	2.482* (0.702 #)
	Permanent Price impact (t-6 to t+1)	0.074(0.081)	9.417*(2.290 #)	2.492* (1.520 #)	3.603* (1.724 #)	2.133(-0.609)	5.077* (1.668 #)
	Permanent Price impact (t-20 to t+1)	0.558(-0.365)	11.198* (2.879 #)	2.823(1.309 #)	3.785(0.989)	1.221(-1.688)	5.813* (1.694 #)
	Post-block price effect (t+2 to t+20)	0.362(0.046)	-1.399(0.101)	-0.258(-0.459)	-0.398(0.308)	-0.431(-0.436)	-0.680(-0.203)
1996	**Temporary Price impact**	0.594 (-0.347)	0.677 (0.003)	1.299* (0.556 #)	7.757* (1.570 #)	25.80* (18.627 #)	2.809* (0.526 #)
	Permanent Price impact (t-1 to t+1)	0.520(0.344)	1.470* (0.897 #)	2.013* (1.010 #)	1.676* (0.955 #)	-0.275(-0.100)	1.573* (0.921 #)
	Permanent Price impact (t-6 to t+1)	0.425(0.301)	1.731* (1.065 #)	3.982* (1.968 #)	2.664*(1.762 #)	0.383(-1.313)	2.469* (1.321 #)
	Permanent Price impact (t-20 to t+1)	1.503(0.809)	2.333(1.806 #)	5.777* (1.183 #)	4.272(1.319)	1.206(0.324)	3.645*(1.579 #)
	Post-block price effect (t+2 to t+20)	0.007(0.692)	-0.109(-0.623)	0.415(0.495)	0.790(-0.101)	-0.863(-1.632)	0.198(-0.217)
ALL YEARS 1992-1996	**Temporary Price impact**	-0.199 (-0.595 #)	0.932*(-0.428 #)	2.578* (0.004 #)	8.757* (1.588 #)	32.17* (10.705 #)	2.712* (-0.101)
	Permanent Price impact (t-1 to t+1)	0.271 (0.141)	1.175* (0.672 #)	0.982* (0.559 #)	0.165 (0.246)	-0.126 (-0.512)	0.690* (0.406 #)
	Permanent Price impact (t-6 to t+1)	-0.949* (-0.602 #)	0.595 (0.107)	0.642 (0.144)	-0.470 (-0.487 #)	-0.362 (-1.508 #)	-0.043* (-0.288 #)
	Permanent Price impact (t-20 to t+1)	-3.136* (-1.861 #)	-1.733* (-1.032 #)	-1.449* (-0.612 #)	-2.584* (-1.742 #)	-1.733 (-2.895 #)	-2.234* (-1.441 #)
	Post-block price effect (t+2 to t+20)	-3.649* (-1.819 #)	-3.837* (-2.055 #)	-4.008* (-2.899 #)	-4.435* (-2.538 #)	-4.353* (-5.767 #)	-3.909* (-2.267 #)

TABLE 5

Price impacts of block trades partitioned by Central market trading system and market value of equity

The table presents results of the price impacts of block trades for Italian common stocks in the period January 2nd 1992 to April 15th 1994. Results are partitioned between the two different downstairs trading systems were active in sample period and by market value of equity. The temporary price impact is computed as the percentage price change between the negotiated block price and the closing price on the day following the block trade. The permanent price impact is computed as the percentage price change between the closing price on the day following the block trade and the closing price on the *n*th day preceding the block date. Permanent price effects are adjusted with the OLS market model using the Italian value weighted market index. Regression parameters are estimated using the Scholes-Williams (1977) procedure from t=-120,..to -21, and from t=+21,..to +120, where t=0 is the block trade date. Test of significance for the mean price impacts (Z-test) are calculated from standardized abnormal returns employing the Dodd-Warner (1983) procedure: * denotes a level of significance $\leq 5\%$. Test of significance for the median price impacts are calculated using the Wilcoxon statistics: # denotes a level of significance $\leq 5\%$. The statistical significance of mean differences between each paired subgroups of block trades executed in the two different downstairs trading systems are evaluated using a *t-test,* which is corrected with the Cochran method in case variances for the paired subgroups are not equals. The statistical significance of median differences between each paired subgroups of block trades executed in the two different central market trading systems are evaluated using a Wilcoxon-Mann-Whitney rank test. *p*-values of tests on block price impact differentials are given in *brackets.*

TRADE DIRECTION	PRICE IMPACTS AND CENTRAL MARKET TRADING SYSTEM	MARKET VALUE OF EQUITY: LARGE FIRMS (> 4000m $US) NOB	LARGE FIRMS MEAN (MEDIAN) in % and Test of significance	MEDIUM FIRMS (>1000m-< 4000m $US) NOB	MEDIUM FIRMS MEAN (MEDIAN) in % and Test of significance	SMALL FIRMS (<1000m $US) NOB	SMALL FIRMS MEAN (MEDIAN) in % and Test of significance	TOTAL SAMPLE NOB	TOTAL SAMPLE MEAN (MEDIAN) in % and Test of significance
	Temporary price impact								
	Floor daily call auction	355	-0.905 (-0.168)	462	-2.403 * (-1.334 #)	1051	-2.392 * (-1.375 #)	1868	-2.112 * (-1.056 #)
	Electronic order driven	583	-1.396 * (-0.980 #)	1017	-1.236 * (-1.060 #)	382	-2.524 * (-2.124 #)	1982	-1.531 * (-1.163 #)
	[p-value of tests on mean (median) differences]		*[0.329 (0.001)]*		*[0.013 (0.132)]*		*[0.795 (0.001)]*		*[0.028 (0.231)]*
	Permanent price impact (t-1 to t+1)								
SELL BLOCKS	Floor daily call auction	355	-2.418 * (-1.304 #)	462	-1.156 * (-0.190)	1051	-1.083 * (-0.785 #)	1868	-1.355 * (-0.712 #)
	Electronic order driven	583	-1.561 * (-1.244 #)	1017	-1.477 * (-1.004 #)	382	-1.209 * (-0.684 #)	1982	-1.450 * (-0.993 #)
	[p-value of tests on mean (median) differences]		*[0.049 (0.718)]*		*[0.403 (0.001)]*		*[0.737 (0.970)]*		*[0.650 (0.001)]*
	Permanent price impact (t-20 to t+1)								
	Floor daily call auction	355	-3.428 * (+0.157)	462	-2.210 * (-0.271)	1051	-4.373 * (-3.690 #)	1868	-3.658 * (-2.041 #)
	Electronic order driven	583	-5.651 * (-3.767 #)	1017	-3.815 * (-3.469 #)	382	-1.780 * (-0.832)	1982	-3.963 * (-3.292 #)
	[p-value of tests on mean (median) differences]		*[0.007 (0.001)]*		*[0.032 (0.001)]*		*[0.001 (0.001)]*		*[0.479 (0.049)]*
	Temporary price impact								
	Floor daily call auction	319	+0.787 (-0.315)	304	+2.286 * (-0.293)	837	+10.199* (+1.047#)	1460	+6.495 * (+0.340 #)
	Electronic order driven	830	-0.999 * (-0.745 #)	1006	+0.139 (-0.443)	543	-0.050* (-1.291 #)	2379	-0.301* (-0.775 #)
	[p-value of tests on mean (median) differences]		*[0.001 (0.010)]*		*[0.032 (0.039)]*		*[0.001 (0.001)]*		*[0.001 (0.001)]*
	Permanent price impact (t-1 to t+1)								
BUY BLOCKS	Floor daily call auction	319	+0.383 (+0.195)	304	+0.641 (+0.622 #)	837	+0.452 (+0.348 #)	1460	+0.476 * (+0.405 #)
	Electronic order driven	830	+0.123 (-0.172)	1006	+0.572 * (+0.673 #)	543	+1.335 * (+0.990 #)	2379	+0.589 * (+0.446 #)
	[p-value of tests on mean (median) differences]		*[0.327 (0.605)]*		*[0.869 (0.609)]*		*[0.012 (0.001)]*		*[0.589 (0.099)]*
	Permanent price impact (t-20 to t+1)								
	Floor daily call auction	319	+0.626 (+0.940 #)	304	-2.317 * (-1.604 #)	837	-3.077 * (-2.640 #)	1460	-2.110 * (-1.046 #)
	Electronic order driven	830	-3.322 * (-2.287 #)	1006	-1.189 * (-0.988 #)	543	-0.751 (+0.027)	2379	-1.833 * (-1.459 #)
	[p-value of tests on mean (median) differences]		*[0.001 (0.001)]*		*[0.204 (0.337)]*		*[0.015 (0.001)]*		*[0.590 (0.746)]*

TABLE 6

Regression models of the determinants of price impacts of block trades

The table presents parameter estimates for the following model:

$$BPIMPACT_i = a + b_1 ROS + b_2 \ln MV_i + b_3 \sigma_i + b_4 DTS + b_5 Dyear92 + \ldots b_8 Dyear95 + e_i$$

$BPIMPACT$ is either the temporary or the permanent price impact. The temporary price impact is computed as the price change between the negotiated block price and the closing price on the day following the block trade. The permanent price impact is computed as the price change between the closing price on the day following the block trade and the closing price on the *n*th day preceding the block date. Permanent price effects are adjusted with the OLS market model using the Italian value weighted market index. Regression parameters are estimated using the Scholes-Williams (1977) procedure from t=-120,..to -21, and t=+21,..to +120, where t=0 is the block trade date. ROS is block trade size and it is measured as the ratio of number of shares traded to total number of outstanding shares. $\ln MV$ is the natural logarithm of stock' s market capitalization (in billions of Lire) at day t=-21 or earlier. σ_i is the stock's daily return standard deviation computed over the period t=-120,..to -21, and t=+21,..to +120, where t=0 is the block trade date. DTS is a dummy variable which equals 1 when downstairs trading was conducted in the electronic continuous market and zero when downstairs trading was in the floor-based daily call market. $Dyear$ is a dummy variable for years 1992, 1993, 1994 and 1995. Figures in parentheses are OLS standard errors, whereas numbers in brackets are Newey-West (1987) autocorrelation- and heteroskedasticity-consistent standard errors.

VARIABLE	SELLER-INITIATED			BUYER-INITIATED		
	Temporary impact	**Permanent impact (t-1,t+1)**	**Permanent impact (t-20,t+1)**	**Temporary impact**	**Permanent impact (t-1,t+1)**	**Permanent impact (t-20,t+1)**
Constant	-0.054 (0.006) [0.008]	0.007 (0.005) [0.005]	0.071 (0.010) [0.014]	0.160 (0.014) [0.026]	0.033 (0.005) [0.006]	0.070 (0.011) [0.018]
ROS	-0.348 (0.048) [0.132]	0.015 (0.039) [0.017]	-0.030 (0.083) [0.065]	1.324 (0.119) [0.614]	-0.109 (0.040) [0.034]	-0.259 (0.094) [0.088]
$\ln MV$	0.004 (0.001) [0.001]	-0.002 (0.001) [0.001]	-0.005 (0.001) [0.002]	-0.014 (0.002) [0.003]	-0.002 (0.001) [0.001]	-0.001 (0.001) [0.002]
σ	-0.015 (0.009) [0.008]	-0.054 (0.007) [0.010]	-0.463 (0.015) [0.041]	0.045 (0.024) [0.037]	-0.030 (0.008) [0.014]	-0.473 (0.019) [0.041]
DTS	0.011 (0.003) [0.004]	-0.002 (0.002) [0.003]	-0.011 (0.005) [0.006]	-0.038 (0.007) [0.011]	-0.001 (0.002) [0.003]	-0.019 (0.005) [0.005]
$Dyear = 1992$	0.017 (0.004) [0.004]	-0.007 (0.003) [0.003]	-0.041 (0.007) [0.008]	-0.012 (0.010) [0.012]	-0.012 (0.003) [0.003]	-0.049 (0.008) [0.009]
$Dyear = 1993$	-0.003 (0.004) [0.004]	-0.008 (0.003) [0.003]	-0.050 (0.007) [0.010]	-0.004 (0.010) [0.009]	-0.010 (0.003) [0.004]	-0.053 (0.008) [0.010]
$Dyear = 1994$	-0.003 (0.004) [0.003]	-0.006 (0.003) [0.003]	-0.066 (0.006) [0.009]	-0.012 (0.009) [0.007]	-0.008 (0.003) [0.003]	-0.067 (0.007) [0.009]
$Dyear = 1995$	0.013 (0.005) [0.003]	-0.004 (0.004) [0.004]	-0.020 (0.008) [0.008]	0.025 (0.011) [0.013]	0.009 (0.004) [0.007]	0.023 (0.009) [0.016]
$Adj.\ R^2$ (%)	3.34	1.57	18.97	6.26	1.72	14.71
$p-value\ F-test$	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
N	5662	5662	5662	5746	5746	5746

TABLE 7 – Summary results of regression analysis of block price effects and trade size

The table presents results of trade size parameter estimates from the following regression model: $BPIMPACT_i = a + b_1 TRADE\ \ SIZE + b_2 \ln MV_i + b_3 \sigma_i + b_4 DTS + b_5 Dyear92 + \ldots b_8 Dyear95 + e_i$. $BPIMPACT$ is either the temporary or the permanent price impact. The temporary price impact is computed as the price change between the negotiated block price and the closing price on the day following the block trade. The permanent price impact is computed as the price change between the closing price on the day following the block trade and the closing price on the *n*th day preceding the block date. Permanent price effects are adjusted with the OLS market model using the Italian value weighted market index. Regression parameters are estimated using the Scholes-Williams (1977) procedure from t=-120,..to -21, and t=+21,..to +120, where t=0 is the block trade date. $TRADE\ \ SIZE$ has been defined in four alternative ways: 1) ROS is the ratio of number of shares traded to total number of outstanding shares; 2) log (ROS) is the natural logarithm of ROS size variable; 3) RNV is the ratio of number of shares traded to stock's normal trading volume, where normal volume has been defined as the daily mean number of traded shares during the pre-block trade date period t= -45, ..to t= -21, where t=0 is the block trade date; 4) log (RNV) is the natural logarithm of RNV size variable; $\ln MV$ is the natural logarithm of stock' s market capitalization (in billions of Lire) at day t=-21 or earlier. σ_i is the stock's daily return standard deviation computed over the period t=-120,..to -21, and t=+21,..to +120, where t=0 is the block trade date. DTS is a dummy variable which equals 1 when downstairs trading was conducted in the electronic continuous market and zero when downstairs trading was in the floor-based daily call market. $Dyear$ is a dummy variable for years 1992, 1993, 1994 and 1995. * indicates significance at the 0.05 level or better. All standard errors are calculated using Newey-West's (1987) method. Results on this table are only for block data sorted by trade size (ROS) groups.

TRADE DIRECTION	**PRICE EFFECTS**	**TRADE SIZE VARIABLES**	**BLOCK SIZE (defined as ROS)**				
			1. Small	**2.**	**3.**	**4.**	**5. Large**
SELL BLOCKS	**Temporary**	ROS	**7.06**	**-8.63**	**-1.90**	**-1.61***	**-0.24***
		Log(ROS)	**0.00**	**-0.00**	**-0.01**	**-0.01***	**-0.05***
		RNV	**0.78**	**0.02**	**-0.00**	**-0.00***	**-0.00**
		Log(RNV)	**0.00**	**0.00**	**-0.00**	**0.00**	**-0.01**
	Permanent (t-1 to t+1)	ROS	**17.28**	**-2.32**	**2.65**	**-0.13**	**-0.00**
		Log(ROS)	**0.00**	**-0.00**	**0.01**	**-0.00**	**0.00**
		RNV	**1.52**	**-0.00**	**0.00**	**0.00**	**-0.00**
		Log(RNV)	**-0.00**	**0.00**	**0.00**	**-0.00**	**-0.00**
	Permanent (t-20 to t+1)	ROS	**9.04**	**-4.39**	**6.88**	**0.40**	**-0.07**
		Log(ROS)	**0.00**	**0.00**	**0.01**	**0.00**	**-0.01**
		RNV	**-1.48**	**-0.09**	**-0.01**	**-0.00**	**-0.00**
		Log(RNV)	**-0.01***	**-0.00**	**-0.01**	**-0.01***	**-0.01**
BUY BLOCKS	**Temporary**	ROS	**-95.21**	**16.07**	**2.12**	**6.18***	**0.02**
		Log(ROS)	**-0.01**	**0.01**	**0.00**	**0.05***	**0.02**
		RNV	**0.49**	**0.01**	**0.00**	**0.00**	**0.00**
		Log(RNV)	**0.00**	**-0.00**	**-0.00**	**-0.00**	**-0.01**
	Permanent (t-1 to t+1)	ROS	**-11.99**	**-8.98**	**-1.71**	**-1.24***	**0.01**
		Log(ROS)	**-0.00**	**-0.00**	**-0.00**	**-0.01***	**0.00**
		RNV	**-0.12**	**-0.01**	**-0.01**	**-0.00**	**-0.00**
		Log(RNV)	**-0.00**	**-0.00***	**-0.00***	**-0.00**	**0.00**
	Permanent (t-20 to t+1)	**ROS**	**-0.58**	**-32.84***	**-15.83***	**-2.53***	**-0.06**
		Log(ROS)	**-0.00**	**-0.02***	**-0.03***	**-0.02***	**-0.03**
		RNV	**-0.79***	**-0.01**	**-0.05***	**-0.00**	**-0.00**
		Log(RNV)	**-0.01***	**-0.01***	**-0.01***	**-0.00**	**-0.00**