Global Journal of Management and Business Research
Volume 12 Issue 22 Version 1.0 Year 2012
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Large Trades on the Tunisian Stock Exchange: Downstairs Versus Upstairs Stock Markets

By Monia Antar Limem & Jilani Faouzi
University of Jendouba

Abstract - This study examines the price impact differences between large trades routed to the central market and blocks traded on the upstairs market, on the Tunisian Stock Exchange. The results show that large transactions affect stock prices, whether they are routed upstairs or downstairs. In addition, these price impacts are quite different depending on where the execution takes place, especially around large sales. The results of empirical investigations also show that, when an upstairs market is governed by too restrictive rules and when brokers don't have the reflex or avoid trading upstairs, block market does not necessarily improve cost execution.

Keywords : *upstairs market, fragmentation, cost execution, price impact, and trade difficulty.*

GJMBR Classification : *JEL Code : R53*

Strictly as per the compliance and regulations of :

Large Trades on the Tunisian Stock Exchange: Downstairs Versus Upstairs Stock Markets

Monia Antar Limem [α] & Jilani Faouzi [σ]

Abstract - This study examines the price impact differences between large trades routed to the central market and blocks traded on the upstairs market, on the Tunisian Stock Exchange. The results show that large transactions affect stock prices, whether they are routed upstairs or downstairs. In addition, these price impacts are quite different depending on where the execution takes place, especially around large sales. The results of empirical investigations also show that, when an upstairs market is governed by too restrictive rules and when brokers don't have the reflex or avoid trading upstairs, block market does not necessarily improve cost execution.

Keywords : upstairs market, fragmentation, cost execution, price impact, and trade difficulty.

I. Introduction

With the development of the stock exchange markets, block trades became increasingly frequent and constitute a substantial fraction of the total exchange volume of shares on the most active markets around the word. For example, in the NYSE, 51% of the exchange volume are carried out on transactions of at least 10 000 stocks, while in 1960, the block trades accounted only for 2% of the whole exchange's volume (Frino et al., 2003). This is also the case of the Australian Stock Exchange, where more than 80% of the exchange volume is realized on pieces of 10 000 shares and more (Anderson et al., 2006). In addition, on the Paris Bourse, the block market is an important source of liquidity. Indeed, approximately 67% of orders containing more than 10 000 shares of stocks are negotiated apart from the central market (Bessembinder and Venkataraman, 2004). This increased tendency to negotiate in blocks finds its origin in the proliferation of the activities of institutional investors.

These large transactions can be carried out either at the central market or at the upstairs market. Although the access to upstairs market is subjected to restrictive conditions, block markets are able to survive and to develop. We even observed the development of new alternative exchange systems in order to negotiate large pieces of capital such as the applications; the crossing networks or the dark pools (Oriol, 2008). The success of these markets lies on the incapacity of the downstairs markets to respond to the modern requirements arising from the institutionalization of financial markets. In fact, in the order books, we face the following obstacles. First, there is a difficulty in finding adequate compensation, at any time. Secondly, the excessive transparency, which leads to mimetic behaviors, can break the exchange. Besides, any large order is considered as informed, because it is impossible to detect the true reasons of the exchange. Finally, the implicit execution costs are paradoxically higher for larger market actors (Riva, 2000).

The characteristic of the block markets lies in the special work executed by block brokers, who can gather and share the inherent risks accompanied by the absorption of a large block (Burdett & O'Hara, 1987). Moreover, these upstairs brokers have information about the unexpressed demand and can thus find quickly the necessary pool to absorb a large block trade (Grossman, 1992).

In addition, the block market can filter investors. Thus, only uninformed investors enter the upstairs market (Seppi, 1990). Based on these pioneers' works, several empirical studies have been conducted over the last decade in different markets and across different periods in order to quantify and explain the impact of block trades on asset prices.

It has been shown empirically, that large blocks are not without effects on the stock prices. Kraus and Stoll (1972) were the first to explain these price impacts. They are due either to the short-run liquidity costs, which mean that block initiator must make a price concession in order to bring the necessary counterpart. Alternatively, they are the result of price pressures due to the inelastic supply and demand curves. Lastly, the informational assumption stipulates that investors having superior information, prefer the negotiation of large blocks in order to exploit their informational advantage and thus block trades are regarded as conveying information.

These price effects constitute the implicit costs undertaken by large investors.The literature has shown that trading on the upstairs market minimizes these costs (Madhavan and Cheng, 1997). This result has been also confirmedby Fong et Al (2004). In the same way, Bessembinder and Venkataraman (2004) find that large investors undertake only 20% of the execution costs that they would have supported while trading in the order book.

The objective of this article is precisely to verify these assertions on a small emerging market, like the Tunis Stock Exchange where the access terms to the

Author α : University of Jendouba. E-mail : monia.antar@gmai.com

block market are even more restrictive than those, previously studied in the literature.

II. Block Trades in the Tunisian Stock Exchange

Tunisian Stock Exchange is a pure order-driven market where the confrontation of supply and demand orders is supposed to be executed in an electronic and blind order book, which respects the price and time priority. However, by similarity to the Paris market, the Tunisian Stock Exchange is a highly transparent structure where brokers observe in real time the quantities and prices of transactions. They also acquire information about the five best limits of the order book and their related agent codes. Such architecture as Muniesa (2003) explains it, makes possible the quick pass from the order book to the telephone for the execution of the large orders. The Tunisian Stock Exchange has created his upstairs market in 1997 in order to facilitate block trades. This market was operating only for fifteen minutes after the close of the central market, and the Normal Block Size (NBS) was arbitrarily fixed at 10 000 titles. Moreover, the market authorities may refuse a block trade if the depth of the order book allows a centralized execution. We have to add to this, the fact that in order to accept a decentralized execution, the stock must knew a movement in the central market for a minimal quantity of 1000 shares for stocks traded on the continuous auctions and 500 shares for those traded on the call auction (fixing).

However, the decree of April 15th, 2008, brings a revision to the regulation governing block trades. In this sense, the Minimum Amount of a Block (MAB) is set at 100,000 TND, and a block trade can take place either in the pre-opening period or during the continuous trading session. Besides, there was a repeal of the last two conditions cited above. Nevertheless, the block brokers have the obligation to fill the limit orders of the trading crowd. This is a considerable relief of the atmosphere on the block trading.

III. Data and Descriptive Statistics

In accordance with the article 88 of the General Regulation of the parquet, the Tunisian Stock Exchange specifies in its daily bulletin in addition to the date of the trading session, the opening price, the closing price, the highest and the lowest price as well as the exchanged volume, for all listed securities.

Besides the daily bulletins, we extract data from the consolidated order book also called market by limit. This is composed for each financial instrument, of the five best limits of purchases classified in a decreasing order of prices, and of the five best limits for the sales classified in ascending order of prices. For each limit, the total quantity of the order book appears.

Concerning block trades, the data extend from 1 January 1999 to 30 November 2007. The data contain complete records describing all trades taking place in the upstairs market. The collected information provides for each block trade, the date, the code and the title of the security, as well as the price and the volume fields. Furthermore, it was possible to obtain information regarding brokers' codes except for 2006 and 2007.

However, the data collected provides only the date as mentioned but not the precise time of the block trade. So, due to the absence of intraday data we don't know exactly what time a specific transaction takes place and when a buyer and a seller decide to move to the upstairs market. We will thus work based on interday data.

In addition to the above data, large on-market transactions' data were also collected. This data contains the date and exact time, code value, volume and price of each transaction. An on-market trade is assimilated to a block trade when the quantity traded equals or exceeds an NBS (set at 10,000 for all securities) and 100,000 TND. The NBS thus fixed, involves a considerable amount that can hardly find a counterpart within the quantity available at the best limit. Therefore, a block is often carried out in several slices representing different limits reached, and the marginal price is getting more and more unfavorable for the trade initiator.

Empirically, a market order may be executed against a series of limit orders. That is why several successive and separate recordings in the database appear, while, in reality they are part of a single exchange. Consequently, a sequence of transactions is combined and thus treated as a unique exchange, while the records are on the same date and time.

A first step is thus to aggregate the quantities of securities with several records at the same time and to calculate the weighted average price. Then, we only need to filter the data in order to obtain a sample in which quantity is at least one NBS, and the total volume is equal to or greater than 100,000 TND.

However, the observation of simultaneous exchanges does not necessarily mean the execution of a large volume against several limit orders. Indeed, in the opening of a session, there is a call auction and compensation at the same price for a number of orders introduced during the pre-opening period, resulting in multiple records at the same time. Thus, we exclude from our sample all volumes corresponding to the first exchange of the day.

The off-market trades and the large on-market ones, will be divided into transactions initiated by a buyer and transactions initiated by a seller. This distinction is necessary since the price effects are opposite, and their aggregation can neutralize them.

In our study, we classify the blocks as follows. We initially follow the work of Frino et al. (2003) i.e. a

combination between the "tick test" and the "bid-ask" method. Then we perform a second classification using the method of "the true value" of Martinez et al (2005). A block is finally classified as buyer or seller initiated, when both classifications converge.

Identifying the sense of a large on-market order is done without any ambiguity. A large on-market buy is represented by a purchase order executed against several sell orders. While a large on-market sale is identified when a sell order is executed against a series of purchase orders available in the other direction of the order book.

Table 1 describes the characteristics of transactions examined in this study. This reveals that whatever the selected criterion of the size of the block (quantity or money, i.e. NBS or MBA) the results attest the superiority of the size of block buys.

The average size is 7.449 NBS for block purchases and of 5.693 for the block sales. It is also noted that the block sales are more concentrated around the average than the block buys with a standard deviation of 10,382 NBS against 17,113 NBS. The distribution by Fractiles of size shows that 10% of the block buys are greater than 16 NBS against 13,58 NBS for the block sales.

In the same way, the analysis of exchanged volumes in TND shows that a block sale implies an average volume of 11.815 MABagainst 15.524 MAB for the purchases. The median is of 4.944 MAB for the purchases, and it is higher than that of the block sales, which equals to 4.348. Thus, we could say that the informational content was bigger for the purchases than for the sales.

Since block buys are larger than block sales, the filtering hypothesis is thus rejected. The latter states that the block market filters the investors. Thereby, only trades certified uninformed pass by the upstairs market.

This result can be explained as follows. On the Tunisian Stock Exchange, a block buyer is potentially informed, if he passes by the central market, he faces the mimetic behavior and the illiquidity of the downstairs market. In this sense, his buy could take several days, which could discourage him and push him to abandon his exchange. Thus, passing through the upstairs market is the only possible alternative. On the other hand, a block seller can divide his big order into a series of small ones, since it is more likely that he is motivated by liquidity needs.

It is expected therefore, that block buys to have a permanent price effect while block sales should cause temporary effects. This is what we will verify by calculating the effects of block trades on asset prices.

In addition, the transactions, which reach or exceed 10,000 titles and 100,000 TND, do not all pass by the block market. The simple presence of these large transactions in the order book shows that the central market can be a sufficient source of liquidity for large investors.

Despite their low frequency of occurrence approximately 0.19% of all orders placed on the central order book, orders of more than 10,000 titles represents a significant part of trading volume. Indeed, they represent almost half of the volume traded on the Tunisian Stock Exchange (44.90%).

The average size of these transactions, whether they are a buyer or a seller initiated, is 2.6 NBS. Similarly, the size expressed in MBA is approximately the same for large purchases and large sales on the central market, and it is of more than 3 MBA. There is also a similarity in the number of observations of purchases and sales.

However, the data, whether expressed in NBS or MBA, shows that the size of the on-market transactions is much smaller than that of blocks traded off-market. Thus, the block market seems to fulfill its role, which is the execution of large trades.

Table 1 : Summary statistics of trade size

This table reports the number of observations, the mean, median, minimum, maximum, standard deviation and Fractile 90%, 75%and 25%for both share volume and dinar volume.On and off-market traded buys are presented in Panel 1 and on and off-market sales are shown in Panel 2). NBS means Normal Block Size and equals to 10,000 shares and MBA refers to Minimal Block Amount equals to 100,000 TND. The sample consists of block trades and large on market transaction on the Tunisian Stock Exchange, for the period of January 1, 1999 to November 30, 2007.

Panel 1 : Large buys				
Market	Upstairs Market		Downstairs Market	
	NBS	MBA	NBS	MBA
Mean	7.449	15.524	2.644	3.513
Stand. Deviation	17.113	31.969	4.011	5.288
Fractile 90	16	42.881	5	6.312
Fractile 75	4.932	13.815	2.916	3.739
Median	2.028	4.944	1.63	2.105
Fractile 25	1.2	2.315	1	1.416
Minimum	0.895	1.05	1	1
Maximum	125	295.492	70	62.4
N	286	286	486	486
Panel 2 : Large sales				
Mean	5.693	11.815	2.665	3.286
Stand. Deviation	10.382	24.089	5.981	5.160
Fractile 90	13.582	25.078	5	5.593
Fractile 75	4.9	8.85	2.5	3.374
Median	2.068	4.348	1.6	2.136

Fractile 25	1.255	2.2	1.025	1.4
Minimum	1	1.004	1	1
Maximum	84.804	199.866	116.324	56.936
N	270	270	444	444

IV. Impact of Largetrades on Asset Prices

Price's behavior surrounding large trades is decomposed into temporary, permanent and total effects. The calculation of these effects poses some problems. Indeed, to perform the calculations, we need the market equilibrium price before the trade takes a place and the equilibrium price in this market after the trade takes place.

Thus, the choice of the pre and post block price is delicate because, informational leaks can occur when the block is being negotiated and also because of the possible delay in the market reaction following the exchange.

Following the works of Keim and Madhavan (1996), Ghysels and Cherkaoui (2003) and Gottardo and Murgia (2003), we calculate price effects using closing prices with an inter day database. We report daily returns based, for several pre-transaction intervals (namely, 1-day, 3-day, 6-day, and 20-day) before the block, and a couple of post transaction intervals (1day,3day). The price's effects will be calculated as follows:

$$\text{Temporary Effect} = \ln(P_b) - \ln(P_c) \quad (1)$$

$$\text{Permanent Effect} = \ln(P_c) - \ln(P_p) \quad (2)$$

$$\text{Total Effect} = \ln(P_b) - \ln(P_p) \quad (3)$$

The results are presented in table 2 (Tab.2)

Table 2 : The effects of block trades and large on-market exchanges on asset prices

This table presents the average price impacts of block trades and large on-market transactions on a cross sectional analysis. Data is from the Tunisian Stock Exchange for the period of January 1, 1999 to November 30, 2007. Panel 1 (Panel 2) details the price impacts of transactions initiated by a buyer (seller). The T of Student are relative to the tests according to which the price impacts equal to zero. a, b, and c indicate statistical significance at 10%, 5%, and 0,01% levels, respectively.

Upstairs Market						Downstairs Market				
Date	t0	t-1	t-3	t-6	t-20	t0	t-1	t-3	t-6	t-20
Panel 1. Blockpurchases										
1.1 Temporary Effect										
t+1	0.303 [a]					-0.743 [c]				
t+3	0.442					-0.982 [c]				
1.2 Permanent Effect										
t+1		1.508 [c]	2.065 [c]	1.941 [c]	1.985 [c]		1.509 [c]	2.271 [c]	3.133 [c]	6.923 [c]
t+3		1.369 [c]	1.926 [c]	1.802 [c]	1.846 [c]		1.747 [c]	2.51 [c]	3.371 [c]	7.16 [c]
1.3 Total Effect										
		1.811 [c]	2.369 [c]	2.244 [c]	2.288 [c]		0.765 [c]	1.527 [c]	2.389 [c]	6.179 [c]
Panel 2. Blocksales										
2.1 Temporary Effect										
t+1	-2.019 [c]					-1.539 [c]				
t+3	-2.778 [c]					-1.764 [c]				
2.2 Permanent Effect										
t+1		-0.325 [b]	-0.275 [a]	-0.401 [a]	-0.289		1.920 [c]	2.7 [c]	3.645 [c]	6.335 [c]
t+3		0.433 [b]	0.483 [b]	0.357	0.469		2.145 [c]	2.924 [c]	3.871 [c]	6.56 [c]
2.3 Total Effect										
		-2.345 [c]	-2.295 [c]	-2.420 [c]	-2.309 [c]		0.381 [b]	1.160 [c]	2.106 [c]	4.79 [c]

We start by analyzing the price effects of off-market exchanges or block trades. Regarding block buys, we note a significant and positive total effect, which implies that prices increase before the block buy, and a non-significant temporary effect i.e. there is no price reversal a day and three days after the block purchase. Thus, the slow and sustained increase in prices a month before the block benefits to the whole market, and the effect is permanent.

For Block sales, the total effect is negative and significant, which means that if prices fell down before the occurrence of a block sale, then we will have a significant price return which continues the following day and three days after the block. Thus, price decline experienced by the share over a month, would be accompanied by a very quick reversal so that the permanent effect is not significant and would even be a price reversal that would exceed the price decline in that month. As a result, block sales cause a temporary drop in prices.

Thus, block purchases are accompanied by a permanent effect on asset prices while block sales induce a temporary effect. These results are similar to those found by Gemmill (1996).

Moreover, the price impact of block sales is higher than that of block buys. This result is contradictory to the findings by Madhavan and Cheng (1997). According to the authors, it is more probable that block sales are justified due to liquidity reasons, and they are easier to arrange since brokers do not have to look for counterparts possessing the share. So their price impact should be smaller. Our result may be explained by the fact that block sales intervene in a less favorable context in terms of liquidity. We think that in the case of block purchases, investors show more patience.

Now, we pass to the analysis of the price impacts of large on-market transactions. The results are quite interesting in the sense that they are different from those found in the literature. Indeed, we find that, large transactions either sales or purchases, occur in a rising trend, i.e. the observed increase before the block is not directly related to the large trade. Moreover, the rise comes always by far, and it is increasingly higher than that on the day before the exchange. Following the exchange of the large order, we record a continuation in the upward movement. This bullish tendency is maintained until the sixth day following the block transaction but without increasing considerably.

Concerning the large on-market sales, as shown in Table 2, the asset price experienced a rise of 4.8% over the previous month and over a 2.1% of the increase a week before the exchange. No price reversal is observed after the large sale. On the contrary, we note an increase of greater than 1.5% of asset price, which reach more than 1.9% a week after the big sale. This results in a positive and significant permanent effect. This could be explained by the fact that investors decided to sell their shares when they reach a desired level of profitability, and this decision does not break the bullish tendency.

As far as large purchases are concerned, we note that they occur in a context even more favorable compared to the sales, as securities experience an average price rise of over 6.1% the month before the exchange or a rise of almost 2.4% one week before the large buy and this increase is of more than 1.5% three days before the exchange. This increase in prices also occurs after the trade and is practically half of the relative increase observed for the sales. Indeed, the day after the large purchase, prices rise by more than 0.74% and reach nearly 1% three days after. One could explain this by the fact that purchases occurred when stock prices had already begun a bullish phase. Moreover, the fact of maintaining the rise shows that intermediaries should, in some ways, show to their client that the stock for which they have directed the purchase "is doing well."

The direct comparison of the price impacts of large on-market transactions and block trades is inappropriate since it ignores the difficulty of an exchange. Hence, in order to compare price impacts, we will adopt a methodology similar to that of Fong et al (2004). It is a two-step procedure. In the first step, we use only the large on-market trades, and we estimate the relationship between price impacts and various measures of trade difficulty. The second step uses the estimated coefficients in the first stage with the characteristics of trades routed to the upstairs market; in order to generate the price impacts of block trades if they had benefited from a centralized execution. The price improvement will be the difference between the impact estimated in the second step and the impact observed in the central market. Of course, we can speak about price improvement, only if the difference is positive.

Based on the fact that block sales are preceded by a price fall in the central market then this decline is being offset the next day and three days following the block trade. Thus, in the block market, we observe a rapid price reversal that will more than compensate the decline of more than 2.3% recorded over one month.

On the other hand, the large sales traded on the central market always come in a bullish tendency and cause a rise in prices. Thus, the behavior of large sales on and off market is so different, that no comparison can be carried out correctly. That is why we opted only for a comparison between the price impacts of block buys and large on-market buys.

V. Estimation of the Price Impact of Large On-Market Buys

Using the methodology similar to Fong et al. (2004) and Frino et al. (2007) and adopting the model to the Tunisian context, the model is as follows:

$$C_t = \alpha_1 + \alpha_2\, lsize_t + \alpha_3 bas_t + \alpha_4 volati_t + \alpha_5\, ldlyv_t + \alpha_6 lcapi_t + \varepsilon_t \quad (4)$$

With:

C_t: Represents the price impact of a large on-market buy.
$lsize_t$:Is the trade size expressed as the logarithm of the number of shares.
bas_t: Represents the average quoted spread five days before the large on-market buy.
$volati_t$: Is the average Hi-Low spread five days before the large on-market buy
$ldlyv_t$: Is the logarithm of the average daily dinar trading volume of the company of trade t five days before the large buy.
$lcapi_t$: Is the logarithm of the average market capitalization of the company of trade t in the same calendaryear
ε_t: Isthe residualterm.

In this last version, we introduced seven dummy variables in order to control the year effect. Dummy variables refer successively at years 2000 until 2007. We have of course omitted the year 2000 in order to avoid the problem of multi colinearity. Similarly, we monitored the effect of sector affiliation by introducing four other dummy variables.Thus, the financial sector, leasing, the car components and the « various »sector were controlled.The heteroscedasticity is corrected according to the white procedure.The results of the estimates are presented in tables 3 and 4 (Tab.3 and Tab.4).The first table reports the estimated coefficients of the explanatory variables of the total effect and the temporary effect while the second relates to the estimated coefficients of the permanent effect.

Table 3 : Determinants of the total and temporary impacts of large buys

This table presents the results of the estimation of the following model:

$$C_t = \alpha_1 + \alpha_2\, lsize_t + \alpha_3 bas_t + \alpha_4 volati_t + \alpha_5\, ldlyv_t + \alpha_6 lcapi_t + \varepsilon_t$$

Where the price impact is the total effect (the first four columns of the table) and the temporary effect (the last twocolumns).[a], [b], and [c] indicate statistical significance at 10%, 5% et 1%levels, respectively.

		Total Effect				Temporary Effect	
Variable	Coeff	t-1	t-3	t-6	t-20	t+1	t+3
Const	α_1	-0.09421	-0.17875	-0.27306	-0.46325	-0.07833	-0.26367
P value		(0.037)[b]	(0.019)[b]	(0.007)[c]	(0.026)[b]	(0.001)[c]	(0.000)[c]
lsize	α_2	0.00702	0.01648	0.02271	0.04436	-0.00174	0.00285
P value		(0.095)[a]	(0.017)[b]	(0.006)[c]	(0.004)[c]	(0.637)	(0.618)
Bas	α_3	0.06173	0.18618	0.07478	-0.86652	0.01455	-0.15066
P value		(0.754)	(0.542)	(0.844)	(0.067)[a]	(0.894)	(0.481)
Volati	α_4	0.04743	1.00849	2.25379	5.01634	-0.39527	0.08201
P value		(0.821)	(0.008)[c]	(0.000)[c]	(0.000)[c]	(0.036)[b]	(0.786)
ldlyv	α_5	0.00010	0.00282	0.00882	0.02433	0.00018	-0.00114
P value		(0.920)	(0.086)[a]	(0.001)[c]	(0.000)[c]	(0.845)	(0.494)
lcapi	α_6	0.00362	0.00302	0.00190	-0.00330	0.00400	0.01409
P value		(0.089)[a]	(0.426)	(0.695)	(0.716)	(0.055)[a]	(0.000)[c]
R^2		6.29%	10.69%	22.93%	36.30%	10.00%	11.26%
Adjusted R^2		2.88%	7.45%	20.13%	33.98%	6.71%	8.04%
N		486	486	486	486	486	486

Table 4 : Regressionsresults: Determinants of the permanents impacts

This table presents the results of the estimation of the following model:

$$C_t = \alpha_1 + \alpha_2\, lsize_t + \alpha_3 bas_t + \alpha_4 volati_t + \alpha_5\, ldlyv_t + \alpha_6 lcapi_t + \varepsilon_t$$

Where the price impact is the permanent effect. [a], [b], et [c] indicate statistical significance at 10%, 5% and 1% levels, respectively.

Date					t+1			t+3	
Variable	Coef	t-1	t-3	t-6	t-20	t-1	t-3	t-6	t-20
Const	α_1	-0.01587	-0.10041	-0.19473	-0.38492	0.16946	0.08492	-0.00939	-0.19958
P value		(0.792)	(0.241)	(0.076)[a]	(0.068)[a]	(0.051)[a]	(0.437)	(0.941)	(0.349)
Lsize	α_2	0.00876	0.01822	0.02445	0.04610	0.00416	0.01363	0.01986	0.04150
P value		(0.065)[a]	(0.013)[b]	(0.006)[c]	(0.005)[c]	(0.529)	(0.120)	(0.046)[b]	(0.010)[b]
Bas	α_3	0.04718	0.17163	0.06023	-0.88108	0.21239	0.33684	0.22544	-0.71586
P value		(0.850)	(0.600)	(0.875)	(0.066)[a]	(0.545)	(0.414)	(0.612)	(0.174)
Volati	α_4	0.44270	1.40376	2.64906	5.41161	-0.03458	0.92648	2.17178	4.93433
P value		(0.111)	(0.000)[c]	(0.000)[c]	(0.000)[c]	(0.924)	(0.049)[b]	(0.000)[c]	(0.000)[c]
Ldlyv	α_5	-0.00008	0.00264	0.00864	0.02415	0.00125	0.00397	0.00996	0.02547
P value		(0.953)	(0.115)	(0.000)[c]	(0.000)[c]	(0.509)	(0.060)[a]	(0.000)[c]	(0.000)[c]
Lcapi	α_6	-0.00038	-0.00097	-0.00209	-0.00729	-0.01047	-0.01106	-0.01218	-0.01739
P value		(0.899)	(0.822)	(0.694)	(0.420)	(0.013)[b]	(0.038)[c]	(0.049)[b]	(0.063)[a]
R^2		11.65	13.40	23.80	37.35	11.81	11.81	19.91	36.24
AjustedR^2		8.44	10.25	21.03	35.08	8.60	8.60	17.00	33.92
N	486	486	486	486	486	486	486	486	486

Concerning the variable size, the coefficients are positive and significant for the total and the permanent effect. Thus, the more important is the exchanged volume, the larger is the impact price. The bid ask spread is non-significant in the majority of the regressions. When it is significant, its sign does not conform to expectations. Indeed, Gemmill (1996), Frino et al. (2007) and Fong et al. (2004) find that the higher is the spread the more important is the price impact. The volatility coefficient is significantly positive for the largest on-market purchases. This reveals that the increase in volatility implies a higher price impact, in accordance with the work of Chiyachantana et al. (2004). The coefficient of the average daily dinar trading volume five days before the buy is positive. It is another proxy of liquidity, and the coefficient does not have the awaited sign. For the logarithm of the average market capitalization, the sign is negative and significant for the permanent effect calculated by using the benchmark post trade t+3. Thus, as explained by Fong et al. (2004), the larger the firm, the higher is the interest of the financial analysts, and the bigger is the genesis of information. All this contributes to a reduction of information asymmetry compared to the small sizes' firms. Thus, the difficulty of the exchange is reduced with market capitalization.

The tables also give the values of the coefficient of determination. The last goes from, 2.88 percent for the total effect of large buys calculated with the closing price of a day before the exchange, to 35.08 percent for the permanent effect calculated from one month before the exchange until the day following it. For the remainder of the regressions, the value of the adjusted R^2 climbs directly from 2.8 to 6.7%. In their model, Frino et al. (2007) find that the coefficients of determination are going from 9 to 28.5 percent and affirm that their model explains better than the best previous models the price changes. Our coefficient of determination is thus considered as in the standard. Regarding the dummy variable relative to the year effect, there was an increase of the price impact over the years (positive and significant). As for variables related to the sector affiliation, we note that the permanent effect tends to increase mainly with the financial sector.

In order to test the proportion of the variation of the price impact explained by each explanatory variable, one variable at a time is removed from the full model and we re-estimate the model. To determine if the omission of a variable reduces the total significance of the model, we use the F test described by Greene (2003) who compares the values of the coefficients of determination of the whole model and the restricted model. The F statistic used is as follows:

$$F[1,\ n-k] = \frac{(R_*^2 - R^2)}{(1-R^2)/(n-k)} \qquad (5)$$

Where n is the number of observations, k is the number of parameter and R^2 is the coefficient of determination of the full model and R_*^2 is the coefficient of determination of the alternate model.

The results are presented in Tables 5 and 6. The first reports the adjusted coefficients of determination of the determinants of the total effect and the temporary effect and the second details those related to the permanent effect. As first striking report, the increase in the adjusted R^2 follows the omission of the bid ask spread. Liquidity approximated by the bid ask spread seems not to have any effect on the price impact, and its omission improves the model. This result is in perfect contradiction with that of Frino et al. (2007) who find that the bid ask spread is the variable that explains the best the price effects of large trades in the Australian Stock Exchange. Furthermore, each of the other variables brings an additional explanatory power to the model. For example, if we remove the variable quantity in the regression of the total effect calculated three days before the large purchase, the adjusted R^2 strongly decreases and passes from 7.45 to 2.15 percent. If we omit the volatility variable, the coefficient decreases significantly and passes from 35.08 to 28.53 percent (for the permanent effect on the period t-20 until t+1). The omission of the variable volatility decreases the coefficient of determination in the majority of the cases, in a significant way (in 10 regressions out of the 14). The volatility variable is the variable that explains the best the price impact of large purchases on the Tunisian Stock Exchange. When we eliminate the average daily trading volume five days before the block (calculated for the total effect one month before the block), the adjusted R^2 drops and passes from 33.98 to 29.46 percent.

Similarly, by abandoning the logarithm of the market capitalization, adjusted R^2 was considerably reduced, especially for the temporary effect calculated three days after the purchase. When we ignorethe variable year, the coefficient also decreases and passes from 33.92 to 31.65 (for the permanent effect calculated from t-20 to t +3). Likewise, the elimination of dummy variables relative to sector affiliation reduces the estimated coefficient from 20.13 to 17.67 (for the total effect calculated from t-6).

Table 5 : Additional explanatory power contributed by the determinants of the total and the temporary impact of large buys

$$C_t = \alpha_1 + \alpha_2\, lsize_t + \alpha_3 bas_t + \alpha_4 volati_t + \alpha_5\, ldlyv_t + \alpha_6 lcapi_t + \varepsilon_t.$$

The impact price refers to the total effect and the temporary effect. One variable, at a time, is removed from the full model, and we re-estimate the alternate model. Statistical significance is derived from the F-test of Greene (2003). This tests whether the omission of a variable significantly affects the adjusted R^2. [a] and [b] indicate statistical significance at 5% and 1% levels, respectively.

	Total Effect				TemporaryEffect	
	t-1	t-3	t-6	t-20	t+1	t+3
Full model	2.88	7.45	20.13	33.98	6.71	8.04
Size	2.15	2.15 [b]	19.13 [a]	32.95 [b]	6.86	8.19
F-Stat	(3.53)	(26.78)	(5.86)	(7.28)	(-0.73)	(-0.76)
Bas	3.03	7.51	20.29	33.74	6.91	8.13
F-Stat	(-0.70)	(-0.31)	(-0.93)	(1.63)	(-0.98)	(-0.44)
Volatility	3.07	5.71 [b]	15.58 [b]	28.00 [b]	5.81 [a]	8.22
F-Stat	(-0.91)	(8.76)	(26.65)	(42.35)	(4.50)	(-0.91)
ldlyv	3.09	7.15	20.29	29.46 [b]	6.90	8.13
F-Stat	(-0.98)	(1.47)	(-0.93)	(32.01)	(-0.96)	(-0.49)
lcapi	2.32	7.51	17.96 [b]	34.10	6.07	4.73 [b]
F-Stat	(2.71)	(-0.33)	(12.71)	(-0.85)	(3.23)	(16.85)
Year	2.82	7.80	18.52 [b]	32.17 [b]	5.97	6.15 [b]
F-Stat	(0.30)	(-1.81)	(9.44)	(12.80)	(3.72)	(9.58)
Sector	2.55	6.77	17.67 [b]	33.08 [b]	7.33	7.69
F-Stat	(1.60)	(3.44)	(14.42)	(6.33)	(-3.08)	(1.78)

Table 6 : Additional explanatory power contributed by the determinants of the permanent impact of large buys

$$C_t = \alpha_1 + \alpha_2\, lsize_t + \alpha_3 bas_t + \alpha_4 volati_t + \alpha_5\, ldlyv_t + \alpha_6 lcapi_t + \varepsilon_t.$$

The impact price refers to the permanent effect.One variable, at a time, is removed from the full model, and we re-estimate the alternate model. Statistical significance is derived from the F-test of Greene (2003).This tests whether the omission of a variable significantly affects the adjusted R^2.[a] and [b] indicate statistical significance at 5% and 1% levels, respectively.

	t+1				t+3			
	t-1	t-3	t-6	t-20	t-1	t-3	t-6	t-20
Full Model	8.44	10.25	21.03	35.08	8.60	8.60	17.00	33.92
Size	7.96	9.24	20.03	34.03	8.72	8.35	16.57	33.14
F-Stat	(2.46)	(5.28)[a]	(5.90)[a]	(7.55)[b]	(-0.61)	(1.29)	(2.41)	(5.50)[a]
Bas	8.62	10.25	21.19	34.86	8.64	8.57	17.11	33.83
F-Stat	(-0.91)	(-0.53)	(-0.96)	(1.60)	(-0.17)	(0.16)	(-0.63)	(0.61)
Volatility	7.93	7.52	15.61	28.53	8.80	7.95	14.22	28.75
F-Stat	(2.62)	(14.25)[b]	(32.14)[b]	(45.47)[b]	(-0.98)	(3.33)	(15.69)[b]	(36.61)[b]
ldlyv	8.64	10.11	19.27	30.90	8.71	8.29	15.16	29.48
F-Stat	(-0.99)	(0.75)	(10.41)[b]	(30.09)[b]	(-0.54)	(1.57)	(10.37)[b]	(31.45)[b]
lcapi	8.63	10.43	21.17	35.13	7.35	7.88	16.47	33.57
F-Stat	(-0.97)	(-0.94)	(-0.84)	(-0.33)	(6.42)[b]	(3.65)	(2.96)	(2.52)
Year	6.97	10.14	19.83	33.26	6.37	7.78	15.41	31.65
F-Stat	(7.54)[b]	(0.57)	(7.10)[b]	(13.08)[b]	(11.44)[b]	(4.21)[a]	(8.98)[b]	(16.10)[b]
Sector	8.22	10.03	19.25	34.40	7.92	7.70	15.51	32.98
F-Stat	(1.11)	(1.16)	(10.51)[b]	(4.90)[a]	(3.51)	(4.62)[a]	(8.38)[b]	(6.67)[b]

VI. Cost Differences between a Large on-Market and a Large off-market Buy on the Tunisian Stock Exchange

In this second step, we observe the variables related to the difficulty of the exchange, on the order book, when a block purchase is being executed upstairs.

Thus, the calculated impact of a large block buy if it would have been run in the central order book is calculated as follows:

$$C_u = \alpha_1 + \alpha_2\, lsize_u + \alpha_3 bas_u + \alpha_4 volati_u + \alpha_5\, ldlyv_u + \alpha_6 lcapi_u \quad (6)$$

$lsize_u$ is the block size expressed in the logarithm of the number of shares.
bas_u representsthe average quoted spread five days before the block buy.
$volati_t$ is the average Hi-Low spread five days before the block buy
$ldlyv_t$ is the logarithm of the average daily dinar trading volume of the company of trade t five days before the block buy.

$lcapi_t$ is the logarithm of the average market capitalization of the company of trade t inthe same calendar year.

The cost difference between on and off-market execution is written as follows:

$$diff_u = c_u - \hat{c}_u \quad (7)$$

With$\hat{c}_u$is as defined above and denotes the calculated impact of a block buy if it would have been rooted in the order book.$c_u$is the price impact of a block trade in the upstairs market as calculated in Chapter 3.If $\text{diff}_u$is positive, then there is price improvement following the negotiation upstairs. If not, the block market increases the execution costs of the block trades.

The results summarizing the price differences are summarized in table 7.

Table 7 : Price changes occurring following the upstairs intermediation

This table reports the average price improvements in a cross-sectional analysis, supposed to occur following an upstairs execution. The price change is $diff_u = c_u - \hat{c}_u$. The results show the differences in price impacts of block buys. The T of student (in parentheses) are related to tests according to which the price impacts would be null.[a], [b], and [c] indicate statistical significance at 10%, 5% and 0,01% levels, respectively.

	P0		P-1	P-3	P-6	P-20
1.1 Temporary Effects						
P+1	-0.0121 [c]	(-7.15)				
P+3	-0.0183 [c]	(-4.90)				
1.2 Permanent Effects						
P+1			-0.0005	-0.0066 [b]	-0.0037	0.0075
			(-0,43)	(-3.14)	(-1.34)	(1.38)
P+3			0.0057 [a]	-0.0002	0.0024	0.0135 [b]
			(1.95)	(-0.06)	(0.62)	(2.10)
1.3 TotalEffects						
			-0.0127 [c]	-0.0189 [c]	-0.0161 [c]	-0.0047
			(-9.42)	(-9.17)	(-5.68)	(-0.92)

Concerning the total effect and the temporary effect, the results show a significantly negative difference, sign of an increase in the impact price following the realization of a transaction in the block market, rising from 1.2% to 1.6%.

Then the price reversal designated by the temporary effect is also higher. This difference in the temporary effect is about 1.2% when the impact is calculated on the following day of the block trade and 1.8% when it is calculated three days after the block. It shows a higher permanent effect (calculated between t-3 and t+1). However, it should be noted that the difference is about 0.66%. Similarly, we observe instead an improvement of the execution cost of 0.57% of the permanent effect calculated between t-1 and t 3. For the rest, there is no significant difference in the permanent effects of large trades routed upstairs or on the central market. These results are not similar to those of Fong et al. (2004) who find a strong obviousness of price improvement on the block market. Indeed, even if the permanent effect varies just a bit according to the two methods of negotiation, the Tunisian block market has got a long way to go. In fact, besides the very special architecture that characterizes the access conditions to this particular segment, the intermediaries themselves have not the reflex to route large orders to the block market. They make the counterpart search, negotiate the price by phone but pass the transaction in the central market. Thus 35% of large exchanges made in the central market are arrangements between intermediaries and imply a single transaction when a purchase order is executed against a sell order.

In this way, if the order does not dig into market depth and have found its counterpart in a single order on the opposite side of the book, there certainly has been a prior counterpart search by phone before placing of the order in the book. In this scheme, the intermediaries should have passed the transaction by

the block market since they are not obliged to contribute to the market guarantee fund for block trades[i].

VII. Conclusion

The literature treating of block trades shows, for most, that the prices continue to rise following block purchases and know a price reversal following block sales. This result is also confirmed for the large on-market trades. Thus, prices react differently for buys and sales, and this makes a puzzling result. This article tries to test these price effects on the Tunisian Stock Exchange and intends to go some way towards achieving the debate around the price improvement occurring while trading in the upstairs market. The results show that block buys induce a positive permanent effect while block sales induce only temporary effects.

On the other hand, we do observe significant positive permanent effects for both large sales and large purchases negotiated on-market. Thus, we observe a different behavior for large sales following the place of execution. Moreover, comparison of prices' effects of large purchases executed on and off the central market was made taking into account the difficulty of the exchange. The results indicate that unlike those found by Fong et al (2004), passing by the block market does not necessarily imply an improvement in trade costs. Indeed, when the access terms to block market are very restrictive and when the intermediaries do not have the reflex to route large orders to block market, price improvements are not systematic.

Appendices

[i]Is in the Management and Economic Sciences University of Jendouba, Tunisia. Corresponding author, Email monia.antar@gmail.com

[ii]Is Professor in the Management and Economic Sciences Unversity of Tunis, Tunisia. Corresponding author, Emailfaouzi.jilani@fsegt.rnu.tn

[iii]This result is different from that found by Riva [2000] which underlines the superiority of the size of the block sales. The author affirms that, as the block buys are more informative than the block sales, it is thus natural to observe more block sales in the transparent market.

[iv]Minimum Block Amount (MBA) is 100,000 dinars.

[v]In accordance with the General Regulations of Exchange, block trades are excluded from the guarantee mechanisms. Indeed, these off market transactions are similar to over the counter operations. "An intermediary who participate in a block trade, chooses its counterpart and thus its risk"- Extract from the market guarantee fund (specifications) Page 6 available at the following address:

http://www.bvmt.com.tn/documentation/statutory-texts/pdf/Reglement-FGM.pdf. Date of the last visit: 08/01/2009.

References Références Referencias

1. Anderson, H. D., Cooper, S., & Prevost, A. (2006). Block Trade Price Asymmetry and Changes in Depth: Evidence from the Australian Stock Exchange. *The Financial Review,* 41.2, 247-271.
2. Bessembinder, H., & Venkataraman, K.(2004). Does an electronic stock exchange need an upstairs market?. *Journal of Financial Economics,* 73, 3-36.
3. Burdett, K., &O.Hara, M.(1987). Building blocks: An introduction to block trading. *Journal of Banking and Finance,* 11.2, 193-212.
4. Chiyachantana, C.N., Jain, P.K., Jiang, C., & Wood, R.A.(2004). International evidence on institutional trading behavior and price impact. *Journal of Finance,* 52, 713-735.
5. Fong, K., Madhavan, A., & Swan, P. L.(2004). Upstairs, Downstairs: Does the upstairs market harm the downstairs. Unpublished Working Paper.
6. Frino, A., Mollica, V., & Walter, T. (2003).Asymmetric price behavior surrounding block trades: A market microstructure explanation. Working paper n°154, Centre of analytical finance, university of Aarhus, Aarhus School of Business.
7. Frino, A., Lepone, A., & Jarnecic, E.(2007). The Determinants of the Price Impact of Block Trades: Further Evidence. *Abacus,* 43, 94-106.
8. Gemmill, G. (1996). Transparency and Liquidity: A Study of Block Trades on the London Stock Exchange under Different Publication Rules. *Journal of Finance,* 5, 1765-1790.
9. Ghysels, E., & Cherkaoui, M. (2003). Emerging Markets and Trading Costs: Lessons from Casablanca. Journal of Empirical Finance, 10, 169-198.
10. Gottardo, P. & Murgia, M.(2003). The upstairs market for large block trade: An empirical analysis of price effects for Italian shares. Working paper n°36, free university of Bozen- Bolzano Italy, school of economics.
11. Greene, W. H. (2003).Econometric analysis. Fth edition, Pearson Education.
12. Grossman, S. J. (1992).The Informational Role of Upstairs and Downstairs Trading. *Journal of business,* 65.4, 509-528.
13. Keim, D. B., &Madhavan, A.(1996). The Upstairs Market for Large Block Transactions: Analysis and Measurement of Price Effects. *The Review of Financial Studies,* 9.1, 1-36.
14. Kraus, A., & Stoll, H. R.(1972). Price Impacts of Block Trading on The New York Stock Exchange. *The Journal of Finance,* 27.3, 569-588.

15. Madhavan, A., & Cheng, M.(1997). In Search of Liquidity: An Analysis of Upstairs and Downstairs Trades. *The Review of Financial Studies,* 10.1, 175-204.
16. Martinez, M. A., Tapia, M., & Yzaguirre, J.(2005).Information Transmission around Block Trades on the Spanish Stock Exchange. *Applied Financial Economics,* 15(3), 173.
17. Muniesa, F. (2003). Des marchés comme algorithme : Sociologie de la cotation électronique à la Bourse de Paris. Ph.Dthesis. Ecole Nationale des Mines de Paris, Centre de Sociologie de l'Innovation.
18. Oriol, N. (2008). Transactions de bloc, fragmentation, et directive Mif : Que peut-on apprendre des données historiques de la place parisienne ?. *Les cahiers scientifiques,* département des études de l'AMF.
19. Riva, F. (2000). Le marché des blocs hors-Cac: Un supplément de liquidité pour la Bourse de Paris. *Cahier du Cereg* n°2000-01, Université Paris Dauphine.
20. Seppi, D. J. (1990).Equilibrium Block Trading and Asymmetric Information. The *Journal of Finance,* 45, 73-94.