Investors' Behavior Placing Orders in Indonesia Stock Exchange

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The objective of this research is to analyze the behavior pattern of trading volume at opening and closing of market in Indonesia Stock Exchange. The behaviors pattern is structured by investors' decision in placing buy and sell orders. This research used intraday data transaction history–corporate edition demand and order history stock which included in pre–opening and LQ–45 in Indonesia Stock Exchange on March, April, and Mei 2005. The result of this research is investor place bigger order on the opening and closing markets than period trading. This shows that they are more carefully and more conservative in doing trades on the opening session. This can occur because of the large orders at the market opening is not necessarily for investors to execute the transaction order status match. Research has found that the pattern of investors in making orders morning session has a reverse J pattern and a pattern of J at afternoon session. Reverse J pattern in the morning session subject to lunch time and most of these patterns of behavior are driven by more dominant sell orders in comparison to buy orders, while the afternoon session or the closing of the market is caused by of investors who want to realize higher transaction match. Other implication is investors must be more active in observing all of the information in doing trading on pre opening, during, and closing of market.

Keywords: Behavior pattern, trading volume, Indonesia stock exchange

Introduction

A number of previous studies have analyzed the pattern behavior of trading volume pattern relationship during opening and closing of market. Researches in United States of America, such as Wood et al. (1985), Wei (1992), McInish and Wood (1991) and Lockwood and Linn (1990) found that the trade pattern and return and spreads at New York State Exchange are U shaped. Researches from and McInish and Wood (1992) and Ho and Cheung (1991) explain that the pattern occurrences are due to influence prior to closing or the so called day-end effect. Brock and Kleidon (1991) state that it happens because generally investors tend to shift risk to other investors, which is also the reason why liquidity trading volume is high.

Research in London Stock Exchange by Abhyankar et al. (1997) examines variation of intraday bid-ask, trading volume and stock volatility, and found that intraday spreads are higher at the opening and remain constant and decrease slightly at closing. Trading volume would be high at 09.30 and would decrease at 13.30 and increase

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slightly at 16.00. Research of Ekinci (2003) in Istanbul Stock Exchange found similar result that the pattern of figure *W* for trading volume during one trading day.

Research in Asia from Lee et al. (2001) found that the pattern of trading has the pattern of *J*. Ding and Lau (2001) used transaction data in Singapore Stock Exchange and found two *U* curves for trading return. Seong's (2004) research at Malaysia Stock Exchange about market microstructures using index future found that volatility pattern is a reverse *J*, and *U* pattern for trading volume. Segara and Segara (2007), who did research in warrant and option in Australian Stock market, found different trading pattern. The pattern of warrant volume trading has the pattern of *U*, the largest volume of trading occur on the market opening and closing. Meanwhile, option trading volume is described as a pattern of *M*, which means that trading volume is lower at the opening, increase sharply at the market closing and decrease quickly at the end of trading. Based on the findings above, it can be concluded that the occurrences of pattern is a global phenomenon due to the vastness of trading volume at closing and opening of market.

The vast amount of trading at market opening and closing is due to information. However, Gerety and Mulherin (1992) say that it is caused by trading halts and investors' own aspiration. Lee et al. (2001) and Admati and Pfeiderer (1988) state that investor tend to place larger order at market opening and closing. It occurs due to investor aspiration to exchange previous risk position. Brock and Kleidon (1991) explain that the rise of transactional trading demand at market opening and closing is caused by investor's inability to trade while market is closing. Brock and Kleidon (1991) think that it happened because

portfolio is optimal at market opening, while at market closing is caused by taste heterogeneity and risk tolerances among investors. Besides, Brock and Kleidon (1991) state that trading volume collection at opening time reflects that trading is accelerated from opening market, while the collection of trading volume is more intuitive[1].

This research is motivated due to the fact that most similar previous researches use daily data and weekly monitoring, which might fail to grasp spontaneous information during intraday market progress. Thus, behavioral pattern analysis of stock market investors trading volume based on data intraday needs to be done. This research gives contribution for analyzing investors' behavior in placing orders in Indonesia Stock Market.

Literature Review

Market microstructure

Market microstructure is a branch of economics and finance related to exchange occurred inside the market in detail, for real asset exchange or financial asset. In trading market, the assets remain unaffected but only being transferred from an investor to another. Market microstructure examines procedures, a market work process influence trading costs, price and volume. Market microstructure is the purest form of finance assets trading intermediacy, such as stock or bond (Stoll, 2003).

Key elements to build market microstructure

Glen (1994) states that there are two key elements investors need to build microstructure activity: trading mechanism

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[1] Bruguier et al. (2007) states that intuitive trade is related with social skills or theory of mind (ToM). Theory of mind is a psychological concept and neuroscience that discusses human interaction with character, trust, emotion, et cetera.

and information process. Trading mechanism is the individual order transferring procedures in a transaction, such as traditional transaction, Walrasian auction, and continuous action. Traditional transaction is all sellers and buyers simultaneously meet and discovery continuing prices until market price is gained as final auction. The result is that market price will reflect all available information for each trader in order. Madhavan (1992) explains that trading mechanism in stock market consists of continuous auction and periodic auction (call auction). Both work by collecting order to be executed simultaneously from efficient information aggregate. Madhavan claims that periodic system increases costs since is not able to give immediate information in executing orders and investors have to collect all market and prices information.

In classic auction all information is combination of price balance. However, the current auction system is slightly different. *Firstly*, imminent information each time can only be included in one market price, which is stated through order placement and transactions result. *Second*, where there is a lack of information, investors need to get information to make decision to determine type of order and the price. Even though market price can differ from its substantial price, automatic order system allows information to be extended to all investors, expecting to minimize infor-mation differences toward investors' group. Automatic system is designed to supply information specifically and limited compared with floor trading system that allow information bias to occur between investors.

Market microstructure approach

Dewati et al. (1994) states that financial market microstructure is determined by price, volume and intraday dynamics. Price in the microstructure market uses some assumptions. *First*, non public information is the information that influences price possessed only by half traders. Therefore, information which is known in advance by certain traders can be used to predict upcoming prices. Traders can have different interpretation on public information, therefore the impact of price is different. *Second*, traders have various transactions motives. Some traders transact to fulfill liquidity needs, while others do so to speculate or profit motive. *Third*, trading mechanism is believed to have an impact on price. A less transparent trading mechanism on value and individual transactional price will cause price to be unobserved by all traders. Thus, it will slow the ability to renew market confidence toward reasonable price and change realized price.

It is indicated that agents have different interpretation in comprehending changes in market environment, particularly trading volume. *First*, inconsistency between trading demand in an event without latest information result in investors' want to speculate. *Second*, financial volume data reported to media is not always clear. *Third*, market institutional design influences trading volume. Trading volume is lower in an imperfect market due to unclear information that make investors trading error[2]. Trading volume is the exchanged amount. The exchange occurs when market agent determine different value to asset (Kyle, 1985). In trading theory there is an assumption that market agent always revise their demand price and locate potential

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[2] Admati dan Pfleiderer (1989) claims that trading volume depends on opinión differentiation when investors accept different information. Therefore, price is suited with incoming information and to deliver the uniqueness of information to each investor.

trading partners. Trading volume increases when investor can interpret and analyze divergent information from previous expectation. Trading volume will decrease if market has market price (Karpof, 1986).

Informed and uninformed investors

Brock and Chung (2000) classify investors in understanding information into two types: informed and uninformed investors. Informed investors are investors that can comprehend all items related to trading process and know when to order to buy and order to sell in all events, such as private information, or good news and bad news. Meanwhile, uninformed investors are investors who are less or lack of awareness of information event or good news and bad news. Thus, it can be concluded that informed investors order more than uninformed investors. Slezak (1994) says that asymmetric information will occur between informed investors and uninformed investors and influence trading volume. Informed investors receive information about the value of assets shift to future when market is opened or closed, whereas uninformed investors can only conclude information from market price and trade randomly. Consequently, uninformed investors are faced with adverse selection problem while trading is very active.

Foster and Viswanathan (1994) classify two types of informed traders. *First*, informed traders who get information directly from other informed traders; *second*, informed traders whom they know extra information by themselves. Lee et al. (2001) state that whether an investor can be classified as informed and uninformed investors can be measured by size of order in lot form. Informed investors are investors who order more than 20 lot, while uninformed investors order less than 20 lot.

Methodology

Intraday trading volume system in this research uses 15 minutes interval by seeking the pattern trading volume at Indonesian Stock Market. The first point is at 09.00–09.25 as the representation of pre-opening session. Interior point is at 09.45–11.45 that represent morning session interior period (inn). The last point for morning season is at 12.00 (close). The first point is 13.45 at afternoon session's trade opening. Interior point is 13.45–15.45 The closing point is at 16.00 by collecting the amount of stock order in one trading day.

Pre-opening is done 25 minutes prior to the beginning of trade (09.00–09.25). This can only be applied to regular market, immediate market and cash market, while price step is not applicable. During pre-opening period, incoming order will not show at the window order book. The result is an opening price which based on market position and accumulation transaction volume from buy volume and sell volume. Order is allocated to opening price based on price and time priority, since the opening price will form pre-opening. If the opening price is not formed, then the whole order during pre-opening period will be withdrawn by Jakarta Automatic Trading System (JATS) before the opening of first trade session.

Data

This research use intraday transaction data on March, April, and May 2005[3], which is based on the data from detailed transaction history-corporate edition demand and order

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[3] Source from Data Program Lab Faculty of Economics and Business UGM. Data LQ-45 from March, April, and May 2005 are used because they are related with research time. This research does not use data from March, April and May 2006-2010 since at the time of the research such data are not yet available.

history, which include stock at pre-opening and LQ-45 at Indonesian Stock Exchange. Stock data from LQ-45 is used since it is the most active and representative stock at trading sample period. However, this research can only obtain 33 stocks data. To identify different investor type and trading behavior, this research used proxy from Lee et al. (2001). They classify informed investors and uniformed investors based on the size of order in the lot form. Informed investors are investors who order more than 20 lot, while uninformed investors order less than 20 lot.

Variables measurement

There are two items that become investors' trade-off, namely pricing priority with waiting cost in placing orders and occurrences of orders. From this trade-off, orders are likely to occur. When investors (traders) want to place low order price (higher) to buy or to sell stocks, it means that the investors are waiting for the best opportunity for getting better price. When orders do not take place, it shows that investors or traders put priority for price rather than for trading. However, when investors place higher order price (lower) to buy (to sell) stocks, it means that they are determined to execute orders. It proves that investors tend to have trading occurred and put less priority on price. When investors are determined to place order in the opening and closing market, then *U*-shaped pattern will appear on buying order and real selling.

Based on the two trade-offs, total order can be classified, i.e.: *first*, total order of buying (B_{it}) on interval i on day t, and total order selling (S_{it}) on interval i on day t. *Second*, total order in this transaction have order status are amend order (*A*), match order (*M*), withdraw order (*W*), and open order (O). *Third*, order form is measured in lot trading form. One lot equals to 500 shares of stock. *Fourth*, amend orders

(*A*) are orders that are changed prior to transactions or match. *Fifth*, match orders (*M*) are allocated processed orders' status or saving sell order with buy order on the same stocks based on the best price considered from sell and buy side. *Sixth*, withdraw orders (*W*) are orders' statuses which are withdrawn before transactions occur. *Seventh*, open orders (*O*) are unallocated or half-allocated orders. *Eighth*, session means the division of a day transaction into two sessions, i.e. morning and afternoon. It relates to session's period in terms of whether the orders last for one session only or two sessions. *Ninth*, interval time is 15 minutes. *Tenth*, buying and selling orders' status amend, match, open, and withdraw are divided into two sessions, i.e. informed order and uninformed orders.

Data analysis process

In analyzing the data, total order is divided into buying and selling order based on pre-opening lot (09.10–09.30) until closing with 15 minutes time interval. Total order in selling and buying order are regrouped based on their orders' status, i.e. amend order (*A*), match order (*M*), open order (*O*), and withdraw order (*W*) in 15 minutes time interval from morning session and second session (afternoon) from opening to closing. Next, orders that have amend, match, open, and withdraw status are classified into informed and uninformed investors. Hypothesis of this research is that investors tend to place the largest orders on the opening and closing of the stock market.

Variance analysis

The essence of the testing is to find out whether there are significant differences between data group. Meanwhile, Anova testing of this research is to find out order placement differences by investors at the stock market opening and closing (Santoso,

2007). Those are done as follows: (a) Distributing buying and selling order data into 15 minutes time interval, where there are 11 intervals during the first session and 10 intervals during the second session; (b) Pre-opening at 09.10 – 09.30 The next 15 minutes trading is trading time interval from 09.45-11.45 as interior period (period inn) and trading for morning session ends at 12.00; (c) Opening does not take place during afternoon session, trading starts from 13.30 until 15.45 and at 16.00 market closes; (d) Conducting F-test analysis (Analysis of Variance) to indicate total order (selling + buying) during opening and closing compared with interior period and to find statistic value $F_{open, Inn}$ compared with interior period or F_{inn}. If the result of F-test analysis at opening and closing shows differences with interior period, then it supports the hypothesis.

Result and Discussion

The pattern of investors' trading behavior in Indonesia stock exchange

Intraday pattern of trading volume based on 33 samples of firms with 21 intervals, i.e. 11 intervals from morning session and ten intervals from afternoon session. Figure 1 and 2 show that intraday trading volume patterns are in U-shaped. Based on

morning and afternoon session, it shows that trading volume pattern in Indonesian Stock Exchange has a reverse asymmetric J pattern for morning session due to lunch break, while J pattern appears at afternoon session. The patterns are similar with several previous studies, such as Admati dan Pflederer (1988), Lockwood dan Linn (1990), Wood et al. (1985), Wood dan Mcinish (1985), Wei (1992), Abyankar et al. (1997), Ding dan Lau (2001), Coppeland and Jones (2002); Ekinci, (2003); and Segara and Segara (2007).

Based on Figure 1 and 2 from trading volume pattern, it can be seen that the largest order occur at opening and decrease dramatically from 09.45 until prior to morning session closing. Next, it increases moderately when afternoon sessions start. This is due to lunch break at Indonesia Stock Exchange. It gradually increases until afternoon session closes at 15.45 to 16.00.

### Investors behavior in placing orders in Indonesian stock exchange

All buying and selling orders are measured in lot form. Anova test is conducted to test the hypothesis which declares significant differences between order at market opening and closing in intraday trading.

Figure 1. Indonesian's stock exchange morning session trade pattern
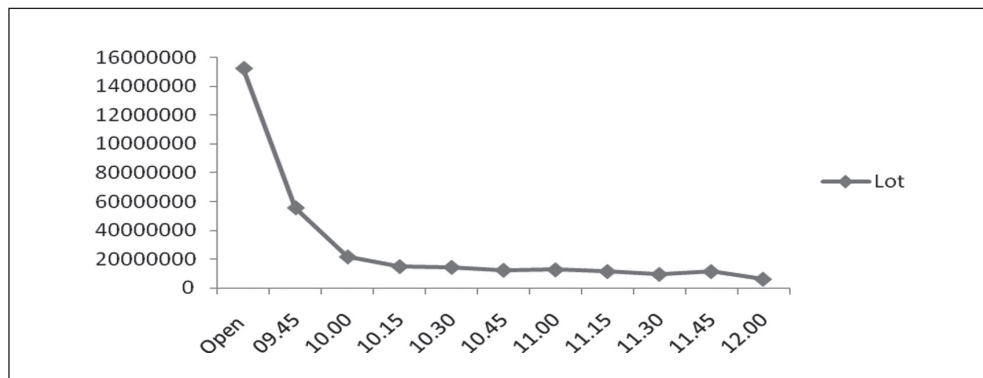
Source: Data processed (2010)

Figure 2. Indonesian's stock exchange afternoon session trade pattern
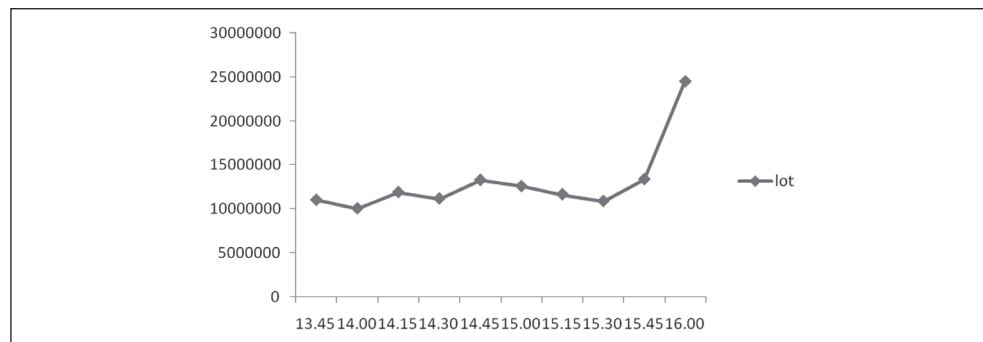
Source: Data processed (2010)

Table 1. Total buy and sell order morning session (lot)

Interval	Buy order (Lot)	Sell order (Lot)	Total Order Lot
Open	54,997,984.00	97,256,367.75	152,254,351.75
9:45	23,069,240.55	32,566,324.97	55,635,565.52
10:00	11,461,755.52	10,167,637.23	21,629,392.74
10:15	7,599,300.77	7,315,272.93	14,914,573.70
10:30	8,177,582.69	6,233,330.16	14,410,912.85
10:45	6,574,456.15	5,799,742.23	12,374,198.37
11:00	6,534,738.88	6,103,736.12	12,638,475.00
11:15	5,511,324.73	5,982,348.11	11,493,672.85
11:30	4,849,778.54	4,623,992.17	9,473,770.71
11:45	5,516,171.55	5,904,305.32	11,420,476.87
12:00	3,088,375.90	3,037,313.79	6,125,689.69
Mean	12,489,155.39	16,817,306.43	29,306,461.82
$F_{open,\,inn}$:	6.471***	13.293***	10.290***
$F_{09:45,\,inn}$:	4.521***	5.777***	5.163***
$F_{close,\,inn}$:	5.325***	6.555***	5.934***

Source: Processed Data; *** at 1% level of significance
Note: $F_{open,inn}$ represents market opening 09:00-09:30
$F_{09:45,inn}$ represents intraday 09:45-11:45
$F_{close,inn}$ represents market closing 11:45-12:00

The result found that morning session F-test shows significant differences between market opening order and market opening closing from morning trading period (Table 1 and 2). The value $F_{open,inn}$ morning = 10.290 dan $F_{close,\,inn}$ morning = 5.934 and $F_{close,\,inn}$ morning = 5.163. However, the afternoon session does not show average differences $F_{open,inn}$ and F_{inn}, except at market closing and F value 2.709. This means that the second afternoon session investors simply place larger order at market closing (Table 2).

Since trading lot order is larger during market opening rather than market closing, Table 2 and Table 3 thoroughly indicate that most patterns are caused by selling order behavior since selling order dominates

buying order. At market opening, selling order lot is 97,256,367.75 compared with buying order lot of 54,997,984.00. Meanwhile, at market closing, selling lot order and buying lot order are relatively balanced. At the end of morning session selling order lot is 3,037,313.79 and buying order lot is 3,088,376.00, while selling order is 12,514,839.60 and buying order lot is 12,040,657.00 at the afternoon session.

The elevated order placement at market opening indicates that investors tend to place order conservatively. From the, data it shows that F-value statistic of buying match and selling match is less compared with other order status. This means that order match status initially increases and fluctuates. However, open and withdraw

Table 2. Total buy and sell order afternoon session (lot)

Interval	Buy order (Lot)	Sell order (Lot)	Total Order Lot
13:45	5,946,022.66	5,057,532.82	11,003,555.48
14:00	5,566,907.70	4,460,127.40	10,027,035.11
14:15	6,287,073.69	5,607,068.30	11,894,141.99
14:30	5,562,714.85	5,600,031.31	11,162,746.16
14:45	7,484,412.09	5,794,097.42	13,278,509.51
15:00	6,693,305.93	5,799,742.23	12,574,593.65
15:15	6,369,943.25	5,881,287.71	12,638,475.00
15:30	5,371,522.70	5,275,140.15	11,645,083.41
15:45	6,364,930.55	5,503,056.48	13,374,550.21
16:00	12,040,656.93	12,514,839.60	24,555,496.53
Mean	6.768.749,04	7.009.619,66	13.039.029,12
$F_{13.45, inn}$:	0.261.	0.501.	0.327.
$F_{14.00, inn}$:	0.281.	0.566.	0.371.
$F_{close, inn}$:	2.373***	3.128***	2.709***

Source: Processed Data**;** *** at 1% level of significance

Note: $F_{13.45, inn}$ represents market opening 13:30-13:45

$F_{14.00, inn}$ represents intraday 13:45-15:45

$F_{close, inn}$ represents market closing 15:45-16:00

Table 3 Amend, match, open, and withdraw (lot) order status

Interval	AMEND (A)		Match (M)		OPEN (O)		Withdraw	
Times	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell
Open	4,853,009.00	8,018,862.50	4,595,355.00	6,789,880.00	38,376,307.00	74,811,342.00	7,091,630.00	7,636,286.70
09:45	2,195,590.23	2,860,285.04	8,596,691.70	8,104,233.35	9,358,981.09	18,429,526.00	2,919,058.54	3,173,637.70
10:00	1,459,375.60	1,394,363.00	4,756,872.05	4,345,513.30	2,970,346.57	2,967,772.80	2,275,161.30	1,459,988.13
10:15	539,376.40	811,698.40	3,526,898.29	3,172,376.69	2,369,142.11	2,543,323.82	1,453,247.94	1,133,083.96
10:30	505,412.20	747,405.80	4,004,720.78	2,925,956.23	2,297,531.31	1,888,580.44	1,167,954.40	807,842.73
10:45	458,562.40	637,826.50	3,336,339.98	2,991,063.40	1,603,668.40	1,523,031.43	1,175,890.37	647,820.90
11:00	444,398.00	709,998.80	2,950,322.20	3,191,332.48	1,666,265.48	1,537,343.04	1,473,753.00	665,061.80
11:15	381,444.20	661,436.00	2,630,324.69	3,505,192.10	1,566,590.40	1,210,592.18	981,254.44	605,127.83
11:30	359,958.00	401,459.00	2,160,221.33	2,099,200.13	1,455,874.01	1,531,494.04	873,724.40	591,839.00
11:45	2,121,115.20	265,437.60	1,912,922.23	1,809,731.87	808,837.25	1,232,572.81	551,806.20	350,757.00
12:00	233,834.60	209,287.20	1,470,177.15	1,558,181.90	785,132.95	661,889.89	599,231.00	607,954.80
13:45	451,261.00	569,217.20	2,856,120.11	1,941,898.11	1,754,641.35	1,760,531.51	884,000.20	785,886.00
14:00	466,149.00	441,289.00	2,868,986.30	2,188,230.05	1,483,932.00	1,404,545.95	747,840.40	426,062.40
14:15	516,325.00	611,610.80	3,208,471.41	2,972,189.21	1,666,808.48	1,413,323.29	895,468.80	609,945.00
14:30	407,739.00	485,088.00	2,671,930.40	2,917,623.40	1,655,164.45	1,672,493.54	827,881.00	524,826.38
14:45	395,606.60	496,707.00	4,154,598.49	2,966,060.49	2,206,132.00	1,659,011.72	728,075.00	672,318.20
15:00	504,559.00	485,225.95	3,488,417.42	3,087,596.12	1,873,117.91	1,679,418.14	827,211.60	629,047.50
15:15	606,542.00	474,733.00	3,109,842.45	2,221,667.85	1,829,768.60	2,067,610.70	823,790.20	511,128.60
15:30	450,877.00	544,736.00	2,520,096.10	2,655,969.80	1,862,106.60	1,759,944.68	538,443.00	542,406.00
15:45	429,110.00	694,083.80	3,339,053.76	3,568,721.26	1,927,122.30	2,206,492.60	669,644.50	540,322.00
16:00	553,956.00	682,115.00	6,206,034.59	6,891,827.28	4,834,794.20	4,413,655.32	445,872.14	527,242.00
Average	873,057,16	1,057,279.31	3,541,161.74	3,424,021.19	4,016,774.50	6,113,071.23	1,330,997.07	1,116,599.27
$F_{open, inn}$:	6.363***	9.687***	2.205***	2.266***	7.,479***	14.343***	4.895***	7.715***
$F_{09:45, inn}$:	3.964***	5.354***	2.,314***	2.326***	3.131***	5.203***	3.447***	4.499***
$F_{close, inn}$:	4.018***	5.229***	2.973***	3.277***	4.691***	6.414***	3.682***	4.382***

Source: Processed Data**;** *** at 1% level of significance

Note: $F_{open, inn}$ represents market opening 09:00-09:30

$F_{09:45, inn}$ represents intraday 09:45-15:45

$F_{close, inn}$ represents market closing 15:45-16:00

status order has a reverse *J* pattern, i.e. high initially and decrease moderately. Amend has *J* reverse pattern at morning session and increase toward the closing of morning session, then, decrease moderately at market closing. This means that there is a large number of orders at market opening but transaction occur only a few. At market closing investors are eager to realize transaction match.

Table 3 shows average differences among match order status and three other order status; i.e. amend, open, and withdraw. *F*-test on market opening show $F_{open\ inn}$ *match* buy = 2.205, $F_{open,inn}$ *open* buy = 7.479, $F_{open,\ inn}$ *amend* buy = 6.363 and $F_{open,\ inn}$ *withdraw* buy = 4.895. In market close, $F_{close,inn}$ *match* buy = 2.973, $F_{close,\ inn}$ *open* buy = 4.691, $F_{close,\ inn}$ *amend* buy = 3.964, $F_{close,inn}$ *withdraw* buy = 3.682, and sell order, $F_{open,inn}$ *match* sell= 2.266, $F_{open,\ inn}$ *open* sell = 14.343, $F_{open,\ inn}$ *amend* sell = 9.687 and $F_{open,inn}$ *withdraw* sell = 7.715. Meanwhile, *F*-test on market closing show

Table 4. Uninformed: amend, match, open, and withdraw (lot) order status

Interval	Uninformed Amend (A)		Uninformed Match (M)		Uninformed Open (O)		Uninformed Withdraw (W)	
Times	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell
Open	16,651.00	58,147.50	51,095.00	173,643.80	561,704.00	612,726.75	26,939.00	31,137.00
09:45	37,660.23	45,692.04	140,144.30	146,076.95	146,904.09	205,153.88	43,535.54	27,025.50
10:00	14,557.60	24,011.00	93,657.05	90,156.80	64,818.57	202,958.80	19,163.30	13,598.13
10:15	10,462.40	15,568.44	66,350.20	66,220.80	47,277.43	56,442.93	14,709.94	11,116.96
10:30	8,418.20	13,773.76	84,195.30	72,787.70	42,282.31	45,143.44	10,785.40	8,575.73
10:45	14,410.40	11,042.50	49,884.08	51,404.50	33,381.40	38,038.43	8,929.37	6,295.90
11:00	5,311.20	8,406.80	38,885.35	41,787.58	32,202.48	33,338.04	8,315.00	6,490.80
11:15	651,898.00	9,538.00	3,459,288.30	45,903.80	1,173,923.00	36,669.18	598,384.00	6,743.83
11:30	393,610.00	7,849.00	2,062,733.80	36,466.33	1,502,361.00	29,133.04	586,486.00	5,353.00
11:45	5,620.20	9,158.00	41,222.21	45,008.61	28,996.40	36,252.58	8,237.44	6,721.83
12:00	6,867.60	4,436.20	26,753.15	25,426.90	18,126.95	28,593.89	5,123.20	3,243.80
13:45	6,042.00	7,713.20	39,679.30	28,860.30	20,103.35	389,848.51	6,677.20	6,275.00
14:00	4,073.00	6,290.00	73,161.30	22,742.05	23,697.00	17,586.95	6,082.40	3,938.40
14:15	6,415.00	8,691.80	44,259.28	39,891.08	20,742.48	23,756.29	6,620.80	5,593.00
14:30	14,816.00	8,452.00	36,268.40	66,945.40	17,883.45	27,076.54	6,529.00	4,851.38
14:45	4,158.00	7,924.00	33,463.49	31,710.49	27,363.00	23,651.72	4,724.00	4,621.20
15:00	4,096.00	6,773.95	45,074.42	31,835.12	18,880.91	23,353.14	4,170.60	3,808.50
15:15	4,378.00	6,328.00	34,526.45	31,064.05	18,618.60	22,935.70	3,891.20	3,785.60
15:30	4,027.00	6,779.00	35,347.60	164,389.30	20,695.60	25,812.68	3,507.00	3,961.00
15:45	3,899.00	7,530.80	39,550.16	38,000.86	26,433.00	31,003.60	3,796.50	3,514.00
16:00	5,804.00	7,358.00	68,917.48	71,635.13	35,687.20	44,828.32	2,460.14	2,570.00
Average	58,246.42	13.403.05	312.593.17	62.950.36	184.861.06	93.062.11	65.669.86	31.137.00
$F_{open, inn}$:	9.208***	22.297***	9.528***	7.380***	15.997***	33.338***	15.789***	16.228***
$F_{09:45,inn}$:	8.017***	14.975***	9.998***	7.373***	8.585***	14.942***	13.265***	10.706***
$F_{close,inn}$:	7.861***	13.843***	9.863***	8.374***	8.621***	14.490***	14.622***	11.175***

Source: Processed Data**;** *** at 1% level of significance

Note: $F_{open, inn}$ represents market opening 09:00-09:30

$F_{09:45,inn}$ represents intraday 09:45-15:45

$F_{close,inn}$ represents market closing 15:45-16:00

$F_{close, inn}$ *match* sell = 3.277, $F_{close, inn}$ *open* sell = 6.414, $F_{close, inn}$ *amend* sell = 5.229, $F_{close, inn}$ *withdraw* sell= 4.382.

Lee et al. (2001) state that investors' conservatism shows at market opening where investors place larger order at market opening. However, the size of order at market opening does not point toward trade volume. According to Lee et al., it indicates that investors do not have intentions to execute order into match. However, the amount of order at market opening indicates that investors have conservative character in placing order. Based on data, it shows that value *F* statistic match buy or match sell is smaller compared with other status order. This shows that order match status is initially high and decreases and rises again. However, open order status has *J* reverse curve pattern i.e. initially high and moderately decrease, and amend has *J* reverse pattern at morning session and increases toward morning market closing and decreases and stay stable at the closing of the market, this means that the amount of order at the beginning of market opening but only several transactions take place. However, at the closing of the market investors are interested to realize transactions (Table 3).

Uninformed and informed investors' behavior placing orders in Indonesia Stock Exchange

Do uninformed dan informed investors also place larger order at market opening and closing? Researches show that both types of investors place bigger order at market opening (Table 4 and Table 5). This is obvious from a relatively high $F_{open,inn}$ significant value compared with F_{inn} and $F_{close-inn}$. Table 4 explains that all uninformed investors status orders has F_{open} value, the largerst inn compared with $F_{09.45,inn}$. Meanwhile, at market closing F_{close}, inn all status order status relatively similar which can measured from F_{close}, inn value approcahing buying or selling.

Table 5. Informed: amend, match, open, and withdraw (lot) order status

Interval	Informed Amend (A)		Informed Match (M)		Informed Open (O)		Informed Withdraw (W)	
Times	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell
Open	4,918,041.00	7,960,715.00	4,544,260.00	6,616,232.00	37,814,603.00	74,198,616.00	7,064,691.00	7,605,149.70
09:45	2,157,152.00	2,788,031.00	8,307,076.40	7,785,504.40	9,148,164.00	18,170,132.00	2,795,970.00	3,112,983.00
10:00	1,444,818.00	1,370,352.00	4,663,215.00	4,255,356.50	2,905,528.00	2,764,814.00	2,255,998.00	1,446,390.00
10:15	505,845.00	736,068.00	3,318,773.81	2,926,357.81	2,250,847.00	2,431,096.00	1,385,035.00	1,072,402.00
10:30	496,994.00	733,632.00	3,920,525.48	2,918,677.53	2,255,249.00	1,843,437.00	1,157,169.00	799,267.00
10:45	444,152.00	626,784.00	3,286,450.90	2,939,658.90	1,570,287.00	1,484,993.00	1,166,961.00	641,525.00
11:00	439,087.00	701,592.00	2,911,436.85	3,149,544.90	1,634,063.00	1,504,005.00	1,465,438.00	658,571.00
11:15	374,699.00	6,745.20	2,588,432.29	41,892.40	1,536,740.00	29,850.40	924,973.00	7,992.44
11:30	355,098.00	4,860.00	2,124,341.80	35,880.33	1,428,396.00	27,478.01	867,013.00	6,711.40
11:45	375,232.00	645,471.00	2,549,850.29	3,400,455.30	1,554,083.00	1,174,506.00	952,930.00	586,732.00
12:00	226,967.00	204,851.00	1,443,424.00	1,532,755.00	767,006.00	633,296.00	594,108.00	604,711.00
13:45	445,219.00	561,504.00	2,816,440.81	1,913,037.81	1,734,538.00	1,370,683.00	877,323.00	779,611.00
14:00	462,076.00	434,999.00	2,795,825.00	2,165,488.00	1,460,235.00	1,386,959.00	741,758.00	422,124.00
14:15	509,910.00	602,919.00	3,164,212.13	2,932,298.13	1,646,066.00	1,389,567.00	888,848.00	604,352.00
14:30	392,923.00	476,636.00	2,635,662.00	2,850,678.00	1,637,281.00	1,645,417.00	821,352.00	519,975.00
14:45	391,448.60	488,783.00	4,121,135.00	2,934,350.00	2,178,769.00	1,635,360.00	723,351.00	667,697.00
15:00	500,463.00	478,452.00	3,443,343.00	3,055,761.00	1,854,237.00	1,656,065.00	823,041.00	625,239.00
15:15	602,164.00	468,405.00	3,075,316.00	2,190,603.80	1,811,150.00	2,044,675.00	819,899.00	507,343.00
15:30	446,850.00	537,957.00	2,484,748.50	2,491,580.50	1,841,411.00	1,734,132.00	534,936.00	538,445.00
15:45	425,211.00	686,553.00	3,299,503.60	3,530,720.40	1,900,689.30	2,175,489.00	665,848.00	536,808.00
16:00	548,152.00	674,757.00	6,137,117.11	6,820,192.15	4,799,107.00	4,368,827.00	443,412.00	524,672.00
Average	783,928.65	1,009.050.77	3,506,242.38	3,166,048.80	3,987,069.01	5,889,018.92	1,331,907.33	1,060,414.31
$F_{open,inn}$:	6.884***	9.121***	1.939***	2.010***	6.190***	12.108***	4.497***	7.508***
$F_{09:45,inn}$:	4.464***	5.094***	2.077***	2.123***	2.915***	4.547***	3.171***	4.495***
$F_{close,inn}$:	4.537***	5.017***	2.742***	3.051***	4.445***	5.747***	3.329***	4.349***

Source: Processed Data; *** at 1% level of significance

Note: $F_{open,inn}$ represents market opening 09:00-09:30

$F_{09:45,inn}$ represents intraday 09:45-15:45

$F_{close,inn}$ represents market closing 15:45-16:00

Next, Table 5 indicates that informed investors also place the largest order at market opening. This shows from the elevated $F_{open,inn}$ value for each order status except for match order status which has $F_{open,inn}$ value smaller than other order status. Besides, informed investors do less match transactions compared with uninformed investors at market opening, i.e. 1,939 buying order, and 9,528 order, 2,010 selling order, 7,380 for selling order.

Conclusion

The findings of this research inform about investors' behavior who place larger order at market opening and closing from period in trading. This implicates that investors are more cautious and more conservative in trading. Morning session has a *J* reverse volume trading pattern and a *J* pattern for afternoon session due to lunch break. The findings also confirm about investors' behavior in placing order at Indonesian Stock Exchange, where the placement of the largest order occurs at market opening and closing. Investors are more conservative during market trading at market opening. It shows that only a few match transaction takes place. Meanwhile, at market closing, investors are eager to realize match transaction and risk to all investors simultaneously.

This research also finds that investors' trading behavior pattern has a *J* reverse pattern on morning session and has a *J* pattern for afternoon session. *J* reverse pattern on morning session occurs due to lunch break. Besides, the behavior pattern is encouraged by the dominance of sell order compared to buy order. The *J* pattern on afternoon session or market closing is highly determined by investors who wish to realize transactions. Another implication from these findings is that investors have to search information actively in stock market trading during pre-opening, interior and market closing. This will reduce investors risk themselves of market and realize their trading into match immediately.

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