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## **THE EFFECT OF INSTITUTIONAL OWNERSHIP TO VOLUME REACTION AROUND EARNINGS ANNOUNCEMENTS AT THE JAKARTA STOCK EXCHANGE**

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### **Abstract**

*This study examines trading volume reaction to earnings announcements; specifically the effect of information asymmetry across investors before earnings announcement, in the form of differences in ownership structures measured by the level of institutional ownership, to trading volume around earnings announcements. Further, this study also examines other factors related to volume reaction around earnings announcements such as price changes resulted in certain unexpected earning levels, cost of transactions, and firm size.*

*The Ordinary Least Square (OLS) method is initially used in finding the relation between unexpected trading volume in two-day and seven-day announcement period windows to the independent variables used in this study. Further, this study applies the Weighted Least Square (WLS) method to eliminate the potential heteroscedasticity and to increase efficiency of the model.*

*This study finds that institutional ownership level as a measure of information asymmetry across investors affects volume response to earnings announcement. The study finds that trading volume reaction is an increasing function of the level of information asymmetry. The study also finds that trading volume reaction is an increasing function of price changes and firm size, yet it has a negative relation to transaction costs.*

**Keywords:** *institutional ownership, information asymmetry, earnings announcement*

## I. INTRODUCTION

Information availability in the stock market, especially the availability of publicly available information is one of many indicators of the related market's performance. From that point of view, a market is classified as efficient if all parties involved in the market have access to all publicly available information. Therefore, at the same time frame, everyone in an efficient market has the same information and there is no information asymmetry.

However, in the real world, such ideal condition is hard to achieve. Information asymmetry exists in markets all over the world and this affects the level of information owned by different types of investor. Institutional investors with sizeable financial support will have more funds to spend in acquiring, accessing, and analyzing information compared to individual investor. As a result, the institutional investors will have more information compared to individual investors. Previous studies by Lev (1988) and Potter (1992) show that institutional investor, relative to individual investors, will be better informed because they tend to have less marginal cost in gathering information and use more resources in doing research on that information.

This different level of informedness across investors exists even before any listed companies issue and disclose another public information. Investors might have the same access to publicly available information but different access to private information. New announcement of information from any listed companies will change the level of informedness across investors. Based on the level of predisclosure information, investor would form their own expectation on their investment. Previous study by Kim and Verrecchia (1991a) shows that each type of investor already have their own optimal portfolio based on their predisclosure information level before any announcement of public information (such as annual report or earnings announcement).

Differences in predisclosure information level may cause investor to place different expectation on their investments. When new information, especially earnings, is released the investors' expectation will change. Changes in investors' expectation will cause trading on stocks which will push stock prices up or down that can induce further trading by the market participants.

Related studies on market reaction around earnings announcements by Beaver (1968) and Bamber (1986) show a positive relation between trading volume reaction and changes in stock prices as a result of earnings announcement. Related study by Kim and Verrecchia (1991) reports that trading volume response to earnings announcement increases with both the absolute price change and a measure of differential precision of predisclosure informedness across traders. Further study by Utama and Cready (1997) that focuses on the differential predisclosure information across different types of investors, finds that volume response as a function of institutional ownership is quadratic with the quadratic curve that

reaches a maximum at around 50%, where volume responses to earnings announcement will increase while the level of institutional ownership still below 50% and decrease while the level of institutional ownership is above 50%.

## **II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **A. BETWEEN INFORMATION ASYMMETRY REFLECTED IN INSTITUTIONAL OWNERSHIP AND TRADING VOLUME REACTION**

A study by Kim and Verrecchia (1991) investigates the price and volume reaction to earnings announcements. The study put emphasis on the differences in the quality of preannouncement information. It assumes that investor already have their own optimal portfolio prior to the announcement and did their trading activities with the information they had in the predisclosure period. The arrival of new information from the earnings announcements will change their prior belief and induce them to engage in new trading activities. It is also assumed that investors are diversely informed and differ in the precision of their private predisclosure information. Hence, they response differently to the announcement and this leads to positive trading volume.

The above study by Kim and Verrecchia (1991) generates three results. First, the price change at the time of earnings announcement is proportional to both the unexpected portion of the announcement and its relative importance across the subsequent beliefs of investors. Second, trading volume reaction is proportional to both the absolute price change and a measure of differential precision across investors. The study suggests that volume reaction depends on the level of precision of investors' private information. Those with less precise predisclosure information would place more weight on the newly announced information and would have larger changes in their beliefs compared to those with more precise predisclosure information. Third, they show that the expected volume and the variance of price changes are increasing functions of the precision of the announced information and decreasing functions of the amounts of predisclosure public and private information.

Further study by Atiase and Bamber (1994) provides empirical evidence about the effect of earnings announcements to investors' trading behavior. The study finds out that the magnitude of trading volume reaction to earnings announcements is an increasing function of both the magnitude of the associated price reaction and the level of predisclosure information asymmetry. This finding supports those of Karpoff (1987) that volume is positively related to the magnitude of the price change around earnings announcements. Back to the study of Atiase and Bamber (1994), they use two different proxies for the unobservable theoretical predisclosure information asymmetry construct: the dispersion and range in analyst

forecast. It turns out that both the proxies show positive relationship with the trading volume reaction to earnings announcements. This result supports the hypothesis that predisclosure information asymmetry can explain the market reaction to earnings announcements.

El-Gazzar (1998) argues that institutional investors have strong incentives to search for private predisclosure information about firms in their portfolios because of their fiduciary responsibilities and large resource bases. To satisfy their fiduciary responsibilities, institutions develop selective investment policies and continuously monitor their portfolios. The efficient selection and monitoring of investments involves large-scale development of private predisclosure information. In addition, large institutional ownership may induce a high level of voluntary disclosure prior to earnings announcements. Empirical tests provide evidence that the higher the institutional ownership, the lower the market reaction to earnings announcements after controlling for security capitalization and the number of analysts following the firm. The result of this study is contradictory to the findings of Kim and Verrecchia (1991) and Atiase and Bamber (1994) that trading volume reaction to earnings announcements has a positive relation to both the absolute price change and a measure of differential precision across investors.

A study by Utama and Cready (1997) tries to develop a model based on an extension of the model proposed by Kim and Verrecchia (1991). The study examines the relation between ownership structure, as revealed by the percentage of outstanding shares held by institutional investors, and trading volume at earnings announcement dates. It finds that there is a positive relation between ownership structure as a measure of information asymmetry across investor and trading volume reaction to earnings announcements. Furthermore, it finds that volume responses as a function of institutional ownership is quadratic with the quadratic curve that reaches a maximum at around 50% institutional ownership. Such a relation is consistent with Kim and Verrecchia's (1991) proposition that trading volume response to public announcements increases with the level of cross-investor variations in precision of private predisclosure information.

Based on previous discussion on several prior studies by Kim and Verrecchia (1991), Atiase and Bamber (1994), and Utama and Cready (1997); we can see that information asymmetry still exist in the capital market. Information asymmetry causes differences in beliefs and expectations about portfolio valuation across different type of investors: individual investors or institutional investors. This information asymmetry is assumed to exist even before the public announcement of new information because of differences in the level of private information acquired by investors. Institutional investors are relatively more informed and have more precise information compared to individual investors. The arrival of new information will change the prior beliefs of investors that will induce trading.

Using the framework developed by Kim and Verrecchia (1991), trading volume reaction reflects differences among investors that are 'canceled out' in the averaging process that determines prices. These differences arise from predisclosure information

asymmetry and predisclosure information asymmetry arises when investors acquire private predisclosure information, and the quality (precision) of this private information differs among investors. They propose that trading volume reaction to a public announcement is an increasing function of the level of predisclosure information asymmetry among investors. Thus, the level of predisclosure information asymmetry is expected to be positively related to trading volume reaction to earnings announcements.

In respect that previous studies have use the level of institutional ownership as a measure of information asymmetry, the first hypothesis investigates the relation between ownership structure and trading volume reaction to earnings announcements: when earnings are announced unexpected trading volume is positively related with the level of institutional ownership.

**H<sub>1</sub> : There is a positive relation between the level of institutional ownership and trading volume reaction to earnings announcements.**

Referring to the findings of Utama and Cready (1997), trading volume reaction to earnings announcements will reach its maximum when the level of institutional investors is around 50%. Before that level, trading volume reaction increase with the level of increase in institutional ownership. After that level, trading volume reaction will decrease as the level of institutional ownership increases. This showed a quadratic relationship between institutional ownership and trading volume reaction to earnings announcements.

To develop the second hypothesis, the assumption that is crucial in this study is that both classes of investors, individual and institutional, have the same level of risk tolerance. This assumption is crucial because the maximum point is sensitive to risk tolerance since investors' decision depends heavily on their relevant risk tolerance; the higher the risk tolerance, the higher the degree toward which the investor will exercise the trade. From the point of view market reaction, a few more risk tolerant investors are more or less equivalent with a large number of less risk tolerant investors. Therefore, the assumption is used to control the effect of risk tolerance level toward investors' trading degree.

Therefore, the second hypothesis investigates whether there is a quadratic relation between institutional ownership and trading volume reaction to earnings announcements: when earnings are announced, unexpected trading volume has a negative and quadratic relation to institutional ownership.

**H<sub>2</sub> : There is a negative and quadratic relation between the level of institutional ownership and trading volume reaction to earnings announcements.**

## **B. BETWEEN UNEXPECTED EARNINGS AND TRADING VOLUME REACTION**

Empirical study by Ball and Brown (1968) shows that accounting earnings not only reflect factors that affect stock prices but also has information content that can affect market reaction. Before earnings announcements, market participants are assumed to have their own beliefs and expectation about the accounting earnings of the firms in their portfolios. Based on that expectation, they form their own calculation about how much is firms' value. The arrival of new information will change their beliefs and expectations. The hypothesis developed by Ball and Brown (1968) that annual earnings announcements convey information to the market is tested using the mean abnormal rate of return for the month of announcement, if earnings announcements have information content, the sub sample of positive unexpected earnings changes should have a positive mean abnormal rate of return in the announcement month and the negative sub sample should have a negative mean abnormal rate of return. The result of the empirical tests gives support to the above hypothesis. Further study by Atiase and Bamber (1994) uses the rate of return as a control for the average change in investors' beliefs. A change in investors' beliefs, as mention before, will induce further trading and increase trading volume reaction to earnings announcements. Their study provides evidence regarding the effect of annual accounting earnings announcements on investors' trading behavior. They find that the magnitude of trading volume reaction is an increasing function of the magnitude of the associated price reaction.

Therefore, the third hypothesis investigates whether volume and earnings are related in a continuous manner. when earnings are announced, unexpected trading volume is positively related with the absolute value of the magnitude of unexpected earnings.

**H<sub>3</sub> : There is a positive relation between unexpected earnings and trading volume reaction to earnings announcements.**

## **C. BETWEEN FIRM SIZE AND TRADING VOLUME REACTION**

As mentioned above, the bigger the firm size, the higher the incentives for investor to do information-gathering activities in order to gain more private predislosure information. Therefore, the earnings announcements will be less surprising for bigger firm size. Investor will place more weight to information about smaller firms from earnings announcements because they have less private predislosure information on smaller firms. The arrival of new information in earnings announcement causes investor to revise their prior belief significantly and induce more trade. Another way to explain the size effect to trading volume reaction is that earnings announcements of smaller firms are more difficult to predict, leading to more surprises that earnings announcement of larger firms. Moreover, the related market reaction on smaller firms will be a sustained one and occur in a period that is considerably

longer than bigger firms. Alternatively, firm size can also measure information availability in the market. Following the result of previous studies by Aggarwal and Rao (1990) and Potter (1992), there is a positive relationship between firm size and percentage of institutional ownership; hence firm size can also be used as a proxy of predisclosure information asymmetry across different class of investors. Utama and Cready (1997) also use firm size as a proxy for the number of analyst following the firm. The larger the firm, the higher the institutional ownership level and the more analyst following, the higher the information asymmetry before earnings announcements and the more variance across investors' beliefs. Hence, increase in trading volume reaction around earnings announcements.

Therefore, the fourth hypothesis investigates the relation between firm size and trading volume reaction to earnings announcement as follows: when earnings are announced, unexpected trading volume is negatively (positively) related to firm size.

**H<sub>4</sub> : There is a negative (positive) relation between firm size and trading volume reaction to earnings announcements.**

#### **D. Between Transaction Cost and Trading Volume Reaction**

The logic behind this relation is considerably simple: transaction cost will increase with the number of transaction occurs. Related to the above concept, the arrival of new information into the market through earnings announcements will induce trading and will increase transaction cost. Therefore the higher the transaction cost the lower the trading activities. There are negative relation between transaction cost and trading volume reaction to earnings announcements.

Therefore, the fifth hypothesis investigates the relation between transaction costs and trading volume reaction to earnings announcements as follows: when earnings are announced, transaction costs have negative impact on trading responses.

**H<sub>5</sub> : There is a negative relation between transaction costs and trading volume reaction to earnings announcements.**

### **III. EMPIRICAL PROCEDURES**

#### **A. Data Collection**

Data collected in this study include:

1. Earnings announcement dates of all listed companies in JSX for 5 consecutive reporting years, from 1999 until 2003.
2. Trading data, including daily Individual Stock Index, closing price, and trading volume in number shares traded and rupiah value during the event window, event dates, and estimation periods.

3. The ownership structure of listed companies at end-of-year from the year 1999 to 2003.
4. The number of listed shares at every end-of-month for the period of 2000–2004.

Earnings announcement dates and trading data were acquired from JSX's Data Centre, while ownership structure and the number of listed shares were acquired from the Indonesian Capital Market Directory (ICMD) 2000–2004.

## B. POPULATION AND SAMPLE

After excluding firms operating in the financial sectors, such as banks, insurance, etc; the sample observations should meet the following selection criteria: (1) annual earnings announcement dates are available from JSX, (2) daily trading volume data with no days of zero trading are available on JSX files for the non-announcement and announcement period, that is days  $-70$  to  $+70$  relative to the announcement date ( $t=0$ ), (3) institutional ownership information reported in Indonesian Capital Market Directory, (4) the firm has a December 31 fiscal year-end, (5) the firm has positive equity value at year-end in all observation period, (6) there was no additional corporate action that cause significant changes in the number of outstanding shares traded during the non-announcement and announcement period.

Sample collected in this study is pooled-cross sectional, in which some firms can have all five announcement dates for five consecutive reporting year that meet all the above criteria, while other firms may be able to have only two or three announcement dates that meet the criteria, or none at all. Table 1 shows the application of the above selection criteria reduced the possible sample.

Table 1: Sample selection

Number of listed firms during 1999–2003	1,609	events
Less: Announcement date unavailable	224	events
Illiquid trading	1,208	events
Firms in financial sector	25	events
Firms with other corporate actions	34	events
Number of samples	118	events

## C. EMPIRICAL MODEL

Based on the preceding analysis in relation with prior empirical models of trading reactions found in Utama and Cready (1997) and the developed hypotheses, the following linear model is used in this study with OLS regression:



$$UNVOL_{it} = b_0 + b_1 INST_{it} - b_2 INST_{it}^2 + b_3 ARET_{it} + b_4 LSIZE_{it} + b_5 LPRICE_{it} + b_6 DIFVOL_{it}$$

where:

- UNVOL = the ratio of average daily trading volume in the announcement period to the median daily trading volume in the non-announcement estimation period.
- INST = the proportion of a company's stock held by institutional investors measured at the fiscal year-end preceding the earnings announcement.
- ARET = the absolute value of the cumulative abnormal return around the announcement date.
- LSIZE = the natural log of the market value of common equity measured at the fiscal year-end preceding the earnings announcement.
- LPRICE = the natural log of closing stock price on the pre-announcement date, which is two days before the announcement date.
- DIFVOL = the difference between the mean and the median of daily trading volume in the non-announcement period, included as a control for measurement error in the dependent variable<sup>1</sup>.

#### D. EARNINGS ANNOUNCEMENTS PERIOD

Prior researches suggest that although most trading volume reaction occurs on days -1 and 0 relative to the earnings announcement date, it persists up to five days afterwards (Morse, 1981; Bamber, 1987; and Utama and Cready, 1997). Following the findings of these studies, we employ two earnings announcement periods: a two-day period ( $t = -1, 0$ ) and a seven-day period ( $t = -1, +5$ ), where  $t=0$  denotes the announcement date as found in the JSX files.

#### E. MEASUREMENT OF VARIABLES

##### E.1. Trading Volume Reaction ( $UNVOL_{it}$ )

Earnings announcement trading volume reaction is measured as the percentage of firm  $i$ 's shares traded on day  $t$ , cumulated over two different time periods, a two-day period ( $t = -1, 0$ ) and a seven-day period ( $t = -1, +5$ ), denoted by VOL2 and VOL7. Following Atiase and Bamber (1994) and Utama and Cready (1997), the medians of firm's daily trading volume in two-day and seven-day non-announcement period

<sup>1</sup> The dependent variable in this model is trading volume that possesses a skewed distribution. DIFVOL is included as a measure of this skewness bias.

(MEDVOL2 and MEDVOL7) are used as measures of expected two-day and seven-day volume levels. Median non-announcement period trading volume is calculated as the firm specific median estimation period volume, which is the median of the percentage of the firm's shares traded, cumulated over consecutive two-day (seven-day) period intervals.

$$VOL2_i = \sum_{t=1}^0 V_{it} \quad VOL7_i = \sum_{t=1}^{+5} V_{it}$$

$$MEDVOL2_i = md \left( \sum_{t=1}^2 V_{i,1+m} \right)$$

$$m = 0, 2, 4, \dots, 2((T/2)-1)$$

$$MEDVOL7_i = md \left( \sum_{t=1}^7 V_{i,1+m} \right) \text{ dimana } m = 0, 7, 14, \dots, 2((T/7)-1)$$

The relative unexpected volume in the announcement period (UNVOL2 and UNVOL7) is estimated as the ratio of announcement period trading volume to the expected volume, which is the median non-announcement period trading volume. If there is no trading volume reaction to earnings announcements the ratio should be close to one, while if there is more trading during the announcement it should exceed one.

$$UNVOL2_i = \frac{VOL2_i}{MEDVOL2_i} \text{ and } UNVOL7_i = \frac{VOL7_i}{MEDVOL7_i}$$

## E.2. Institutional Ownership (INST<sub>it</sub>)

The data of institutional and large investor from the ownership structure were measured at the fiscal year-end preceding the earnings announcements and acquired from the Indonesian Capital Market Directory (ICMD). The limitation of using these data is that the regulation in Indonesia only requires firms to disclose investors with ownership of more than 5%, those with ownership less than 5% would not be disclosed publicly. An exception to this regulation is ownership by the member of the board, member of the commissioner, and affiliated companies.

Institutional ownership (INST) is identified as the percentage of a firm's outstanding common stock held by financial institutions as reported in by its financial statements, expressed as a deviation around its mean. Financial institution includes those in banking sectors, insurance, asset management, and pension funds. Because the model includes both the institutional ownership percentage and its quadratic term, the variable is expressed as a deviation around its mean to minimize the possibility of correlation between the series.

### ***E.3. Unexpected Returns ( $ARET_{it}$ )***

Unexpected returns are cumulated over the two- and seven-day event windows. For each day  $t$  during the event window ( $t = -1$  to  $t = +5$ ), a firm's unexpected return is computed using the mean-adjusted model. This approach is used to eliminate the effect of clustering of the sample because most of the announcement dates are clustered around the month of March and April each year (Oppong, 1980).

The mean-adjusted model of calculating expected return is based on the assumption that expected return of share  $i$  at time  $t$  is constant and measured as the average of realized return during the estimation period.

### ***E.4. Firm Size ( $LSIZE_{it}$ )***

Firm size is measured by the market value of common equity at fiscal year-end preceding the announcement that is the date of the earnings report at 31 December each year. Because of the significant difference of either the number of outstanding shares traded or the market value of each firm's stock traded, the natural log of the market value of common equity is used instead.

### ***E.5. Transaction Cost ( $LPRICE_{it}$ )***

Following Utama and Cready (1997), the proxy used for transaction costs is LPRICE. LPRICE measures (inversely) structural bid/ask spread trading costs expressed as a percentage of order value. Since such costs are partially driven by the number of shares traded, their cost per rupiah of order value decreases as stock price increases. Considering that transaction costs have negative impact on trading volume reaction; the coefficient of LPRICE should be positive. Alternatively, LPRICE also measure the commission paid as a function of order value. Hence, transaction cost in rupiah value increases as price increases. From this point of view, the coefficient of LPRICE should be negative.

## **IV. RESULTS AND DISCUSSION**

### **A. SAMPLE DISTRIBUTION**

Table 2 contains the distribution of the final sample. It shows the existence of any financial institution as the proxy of institutional ownership in the composition of shareholder. It shows that only 38.53% of the sample under observation that actually has financial institutions in their ownership structure, while the remaining major part of the sample does not have any.

Table 2 : Distribution of the sample By the ownership structure

Ownership Structure	Frequency	Percentage
With Financial Institution	42	38.53
Without Financial Institution	67	61.47
Total	109	100.00

## B. DESCRIPTIVE STATISTICS

Table 3 presents the descriptive statistics of the sample. Consistent with the findings from previous studies about market reactions around earnings announcements especially those by Morse (1980) and Karpoff (1986), the data provides evidence that there is an increase in the trading volume around announcement date. For the two announcement periods observed in this study: two-day and seven-day, the unexpected trading volume in the related announcement period exceeds the median daily trading volume in the non-announcement period by around 25% and as much as 400%, respectively. It can be said that the trading volume reaction to earnings announcement is higher in the seven-day event window compared to those in two-day event window.

For the ownership by financial institution (FIN), only 42 of the 109 final samples actually have financial institution in their ownership structure. Table 4 shows that ownership by financial institution of the 42 samples, averages around 21.18% with the minimum and maximum amount of 0.17% and 66.8%, respectively. The average amount decreases to 7.36% of the final 109 samples, because of the unavailability of the financial institution in ownership structure. Recalling that the empirical model requires the use of both the value of financial institution ownership level and its related quadratic value and also the fact that more than 50% of the samples have zero amount of financial institution ownership level, the probability of multicollinearity in the model is high. Therefore, another variable that measures a deviation from the mean of the level of ownership by financial institution (INST) is used.

Table 3: Descriptive Statistics of The Data

	Sample Size	Average	Median	Std Dev	Minimum	Maximum
UNVOL2	109	1,2481	0,7892	1,1654	0,0274	5,6752
UNVOL7	109	5,1635	3,9054	3,6267	1,0097	17,7639
FIN	42	0,2118	0,1438	0,2018	0,0017	0,668
FIN	109	0,0736	0	0,1562	0	0,668
INST	109	0	-0,0736	0,1562	-0,0736	0,5944
INST <sup>2</sup>	109	0,0242	0,0054	0,0722	0	0,3533
ARET2	109	0,0336	0,0234	0,0329	0,0002	0,1841
ARET7	109	0,0699	0,0624	0,0558	0,0009	0,2449
LSIZE	109	14,0705	13,8426	1,5983	11,1668	18,0356
LPRICE	109	6,6946	6,3544	1,3718	3,912	10,3321
DIFVOL2	109	0,8889	0,6391	1,2645	-0,0413	11,845
DIFVOL7	109	0,501	0,2849	1,0063	-0,0564	9,6544

Variable description:

- UNVOL is the ratio of average daily volume (measured as percentage of outstanding shares traded) in the announcement period to the median of daily volume in the non-announcement period (days - 70 to - 11 and + 11 to + 70 relative to the announcement date). For UNVOL2 (UNVOL7) the announcement period is days - 1 and 0 (- 1 to + 5) relative to the announcement date. Median non-announcement period volume is calculated as the median of two-day (seven-day) daily non-announcement period volumes.
- FIN is the percentage of shares held by financial institutions at the fiscal year-end before the announcement date.
- INST is the deviation of FIN around its mean.
- INST<sup>2</sup> is the square of INST.
- ARET is the absolute value of the abnormal returns, cumulated over days - 1 and 0 (ARET2) and days - 1 to + 5 (ARET7).
- LSIZE is the natural log of the market value of common equity measured at the fiscal year-end before the announcement date.
- LPRICE is the natural log of closing stock price on day - 2 relative to the announcement date.
- DIFVOL is the difference between two day (DIFVOL2) and seven day (DIFVOL7) mean and median trading volume over days - 70 to - 11 and + 11 to + 70 relative to the announcement date.

### **C. OLS AND WLS RESULTS**

The preliminary test for BLUE assumptions gives the confidence that OLS analysis can be valid and unbiased, except for the existence of heteroscedasticity in the seven-day period regression model. Because of that, the OLS result for the seven-day period regression model cannot be seen as valid and unbiased; it is not a good estimator of the dependent variable. To remedy this problem and achieve better results, White's heteroscedasticity consistent covariance and standard error also the Wiegthed Least Squares method are applied to the seven-day period regression model. The two-day period regression model does not have any problem in clearing the BLUE assumptions; therefore, it does not need the same treatment and can still be evaluated using the OLS method.

Table 4: The OLS and WLS Results

Variable	Expected Sign	Two-day	Seven-day (White's)	Seven-day (WLS)
Intercept	?	0.7709 [0.76]	2.9041 [0.89]	5.2627 [1.64]
INST	+	1.3345 [0.81]	9.37 [1.52]	17.3169 * [3.30]
INST2	-	- 2.4639 [- 0.68]	- 8.5739 [- 0.74]	- 17.5736 [- 1.51]
ARET	+	16.2261 * [4.92]	19.9515 * [3.13]	29.0997 * [5.26]
LSIZE	+/-	0.0343 [0.34]	0.5607 [1.33]	0.7457 ** [2.38]
LPRICE	+/-	- 0.0560 [- 0.46]	- 0.9739 [- 1.85]	- 1.8590 * [- 4.94]
DIFVOL	+/-	- 0.1295 [- 1.51]	- 0.5944 * [- 3.24]	- 0.7288 * [- 4.75]
R Square		0.2072	0.2275	0.2275
Adjusted R Square		0.1605	0.182	0.182
DW value		1.9577	1.8033	1.8033
F-statistics		4.4425	5.0056	5.0056
Prob (F-stat)		0.0005	0.0002	0.0002

\* significant at 1% level

\*\* significant at 5% level

The significance levels are based on one-tail test for variables with known expected signs and based on two-tail test for variables with no hypothesized sign. The value in parentheses is the *t*-value.

Table 4 shows the OLS results for both the two-day and seven-day period regression models. For the seven-day regression model, both the result of OLS adjusted with White's Heteroscedasticity consistent covariance and standard errors and the result of WLS weighted with the most significant independent variable are presented. The usage of White's heteroscedasticity-corrected standard errors resulted in a considerably larger standard errors and smaller estimated *t*-values compared to those obtained by OLS, but this treatment remedy the heteroscedasticity problem arises from using OLS method.

### C.1 The Institutional Ownership Hypothesis

Results of the empirical models above provide evidence that support the first hypothesis claiming that there is a positive relation between the level of institutional ownership and trading volume reaction to earnings announcements; even though the relation is proved to be significant only in the seven-day event window under the treatment of WLS method and not significant either in the two-day event window or the seven-day event window

under the treatment of White's Heteroscedasticity. However, consistent with the results of previous studies by Kim and Verrechia (1991), Atiase and Bamber (1994), and Utama and Cready (1997); it can be concluded that the level of institutional ownership does have some effects on trading volume reaction to earnings announcements. High level of institutional ownership reflects higher distribution of private information to those institutional investors. This causes more deviation in overall investors' beliefs before the actual earnings announcements. The occurrence of earnings announcements causes changes in overall investors' beliefs and induces further trading.

The results also provide evidence that support the second hypothesis, claiming that there is negative and quadratic relation between the level of institutional ownership and trading volume reaction to earnings announcements; even though it is without any significance level acquired in both the event windows. It might be best to remember that the dispersion in the sample, especially about the level of institutional ownership, may be the reason for not achieving any significant level. As noted in previous section, only 42 of the total 109 samples under observation that actually have institutional investors in their ownership structure. Hence, more than 50% of the sample contains the same amount of institutional ownership level.

### ***C.2. The Unexpected Earnings Hypothesis***

Results of the empirical models above provide evidence that support the third hypothesis claiming that there is a positive relation between unexpected earnings and trading volume reaction to earnings announcements; significant in all event windows under observation, both the two-day and seven-day announcement periods. This result is consistent with previous studies by Ball and Brown (1968) that earnings announcement does have information content that can cause market reactions. Furthermore, the result is also consistent with those of Atiase and Bamber (1994) that returns can be a control for changes in investors' beliefs and that a change in expected earnings can cause a parallel changes in investors' beliefs and induce further trading.

### ***C.3. The Firm Size Hypothesis***

Results of the empirical models above provide evidence that supports the fourth hypothesis, claiming that there is a positive relation between firm size and trading volume reaction to earnings announcements, even though this relation is proved to be significant only in the seven-day event window under the WLS treatment since other results from the two-day event window and the seven-day event window under White's Heteroscedasticity proved to be insignificant. However, it can still be concluded that firm size does have some effects on trading volume reaction to earnings announcements. The positive relation shows that

firm size can also be seen as a measure for differences in investors' beliefs. Larger firms usually have more analysts following, hence increasing the different level of predisclosure information; that can cause overall investors' beliefs and induce trading.

#### ***C.4. The Transaction Cost Hypothesis***

Results of the empirical models also above provide evidence that supports the fifth hypothesis claiming that there is a negative relation between transaction costs and trading volume reaction to earnings announcements, even though this relation is proved to be significant only in the seven-day event window under the WLS treatment. The negative coefficient estimated from the models suggests that in Jakarta Stock Exchange, transaction cost is driven by the total amount of order value, not by the number of shares traded. Higher price constitutes higher order value and increases transaction costs. This hampers more trading and decrease trading volume reaction.

### **V. CONCLUSION**

This study is expected to provide evidence as to the effect of the information asymmetry before earnings announcement to trading volume reaction around earnings announcement. The empirical model of this study provides evidence that there is a positive relation between the level of institutional ownership and the trading volume reaction to earnings announcements. This result indicates that such asymmetry in predisclosure information occurs in the Jakarta Stock Exchange and it affects the overall investors' belief after earnings announcements that induce more trading on the related stocks. Furthermore, the model also provides evidence that the relation between information asymmetry with trading volume reaction is not only positive and linear but also negative and quadratic. However, there is not enough empirical evidence as to the significance of this relation.

The reason for this insufficient evidence is that most of the firms listed in Jakarta Stock Exchange especially those that have been included in the sample only have small percentage of their shares held by institutional investors. More than 50% of the observed samples in this study actually do not have institutional investors in their ownership structure. This condition makes the result of this study cannot provides further support to the results of other previous studies in related matters conducted in other more structured markets.

#### **A. LIMITATION OF THE STUDY**

There are several limitations of this study that have been identified, including the overall condition of ownership structure of firms listed in the JSX. Details are explained below:



1. As mentioned above, the overall condition of ownership structure of firms listed in the JSX that still have small percentage of institutional investors holding their share is causing the insignificance of the related variable in the model.
2. The condition of the JSX that still includes many illiquid stocks with only a few trading throughout the year. As can be seen in Table 1 of sample selection, this is the major factor that lessens the number of samples under observation. Further, this limit the exclusion of outliers if the model is to assumed normality.
3. The availability the ownership structure data that is restricted only to those having more than 5% of ownership and only at the end of fiscal year. This cause inaccuracy of the level of institutional ownership because there is a possibility that institutional investors going undetected because they hold a percentage less than 5%.

## **B. DIRECTION OF FUTURE RESEARCH**

Considering the limitation above, it provides greater opportunity of future research in this matter. First, for the calculation of institutional ownership, one can try to exclude illiquid portion of the total shares from the calculation. This will bring more accuracy as to the effect of institutional investor in the overall trading of the related stock. Second, further study should consider other source of information to supply the data of ownership structure, such as directly from the underwriter so that the ownership structure data can be more accurate.

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