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# PRICE OR EARNINGS: WHICH INFORMATION ACCOUNTS FOR THE TRADING OF INSTITUTIONAL AND INDIVIDUAL INVESTORS

**Thanu Prasertsoontorn[1], Ravi Lonkani[2]**

*[1]Chiang Mai University Business School, Chiang Mai, Thailand, thanu.p@cmu.ac.th, https://orcid.org/0009-0006-4064-2632*
*[2]Chiang Mai University Business School, Chiang Mai, Thailand, ravi.l@cmu.ac.th, https://orcid.org/0000-0003-4767-1998*

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*Corresponding Author: Ravi Lonkani (ravi.l@cmu.ac.th)*

## ABSTRACT

***This study investigates institutional and individual investor trading volumes during quarterly earnings announcements. Further, the study investigates the relationship between trading volume one day after the earnings announcement and two information sources: earnings changes and price change information, and observes this relationship for both individual and institutional investors. We use aggregated market microstructure data on trading volume and compute the abnormal trading volume during earnings announcements for both individual and institutional investors. The study period was 2012 – 2015. Multiple regressions are used to test the relationship between earnings surprises and price change information on abnormal trading volume. We find both types of investors decrease their trading volumes before then increase after earnings announcements. Additionally, the study reveals that these two types of investors rely on different information sources for their trading. Specifically, individual investors are significantly influenced by earnings surprise information. In contrast, institutional investors respond primarily to price change information.***

**KEYWORDS:** Institutions Investor; Individual Investor; Earning Announcement; Trading Volume; Thailand.

**JEL**: G11, G14, G21

## 1. INTRODUCTION

Asymmetric information surrounding earnings announcements causes investors to adjust their trades, resulting in changes in trading volume, such as a decrease or increase in trading volume from normal trading days (Bamber, 1986; Bamber et al., 1997; Beaver, 1968; Landsman & Maydew, 2002; Lee, 1992; Nofsinger, 2001). Further, changes in trading volume depend on investors' type and ability to access and analyze arriving information (Agudelo et al., 2019; Chen et al., 2019; Chung et al., 2014; Chung & Wang, 2016). This study examines situations characterized by asymmetric information, and observes the trading behavior of different types of investors.

Previous studies report less than normal trading volumes or negative abnormal trading volumes before earnings announcements (Chae, 2005; Landsman & Maydew, 2002; Mahipala et al., 2009). The negative abnormal trading volume is explained by the asymmetric information theory that traders will lower their trading activities when they are exposed to uncertainty events, and they will increase their trade back to normal after high uncertainty information is resolved (Mahipala et al., 2009; Wang & Yang, 2015). Uninformed investors may also postpone their trading demand during the uncertainty period to anticipate increased demand for informed investors (Chae, 2005). This study analyzes the changes in trading volume before and after earnings announcement dates and explores the changes in trading volume based on two types of information: earnings surprise information and price response information from the market, as shown on earnings announcement dates. Having a unique trading volume dataset for each group of investors allows us to observe abnormal trading volumes for both individual and institutional investors during earnings announcement events because earnings announcements convey new information to the market and are a proxy for higher information asymmetry circumstances (Chae, 2005; Lee, 1992; Ly, 2010; Mudalige et al., 2016; Park et al., 2014; Saleem & Usman, 2022), the observed trading patterns and volumes for the two investor groups before and after earnings announcements can explain how both types of investors access and analyze the received data under higher asymmetric information circumstances (Park et al., 2014).

Our results show that both investor groups in both the pre- and post-announcement periods support the hypothesis that trading volume decreases in a highly asymmetric information period, and that informed institutional investors' trading behavior is less volatile than that of less-informed individual investors (Bamber, 1986; Chae, 2005; Mahipala et al., 2009).

We further analyze the trading behavior of informed and uninformed investors relevant to earnings announcements by hypothesizing that informed and uninformed investors behave differently when exposed to information on earnings announcement dates. On earnings announcement dates, both informed and uninformed investors are exposed to earnings surprise and market response information. Earnings surprise is the absolute percentage change in profit from the previous year's profit for the same quarter and serves as a proxy for earnings anomalies based on companies' historical financial operations. Price response information refers to stock returns on the announcement date, encompassing the immediate reaction of the stock market to new information or new shocks that might influence companies' prospects and risks of companies (Ball, 1992; Boehmer & Wu, 2013; Chambers & Penman, 1984). Neither group of investors possesses the equal ability to analyze and forecast the future performance of firms (Jalilvand et al., 2018). Informed traders are suspected to rely more on market prices (Choy & Zhang, 2021; Engelberg et al., 2012; Glaser & Weber, 2009) but less on earnings surprises when they encounter information on event dates. We expect that the trading volumes of both investor groups are not affected similarly by earnings surprises or price change data on earnings announcement dates.

Our results reveal that institutional investors' post-announcement abnormal trading volume is not influenced by the magnitude of the earnings surprise but is caused by how the market reacts to the announcement on the event dates. In contrast to institutional investors, earnings surprises on announcement dates affect individual investors' abnormal trading volumes.

This study provides new evidence and contributes to the literature in several ways. First, the unique SET-market microstructure dataset enables us to observe the trading behavior of both types of investors in the Thai stock market, leading to the interesting conclusion that market participants are not a homogeneous group and do not have the same ability to analyze information when exposed to public announcements (Bekaert & Harvey, 2003). Therefore, an earnings surprise for one investor group may not have a similar interpretation, and may not exert a similar influence on the trading behavior of other groups with different degrees of

information capabilities. Second, we provide a novel explanation for the announcement effect on trading volume for each investor group based on historically based earnings information and unpredictive price response information. Our analyses provide distinct evidence that trading by informed traders is driven more by market responses than earnings surprise information. To the best of our knowledge, this study is the first to show that distinct investor types trade on the basis of different sets of information.

Our findings have several important implications. The prevalence of asymmetric information in financial markets (Kacperczyk & Pagnotta, 2019) responds to investors' unequal market abilities. The presence of informed and uninformed traders affects economic outcomes (Kacperczyk & Pagnotta, 2019). Understanding these effects will benefit policymakers by improving market quality. We provide substantial knowledge that individual investors in the Thai stock market differ from institutional investors in terms of information accessibility and analysis ability.

The remainder of this paper is organized as follows. Section 2 provides a literature review and develops our hypotheses. Section 3 describes the data, methodology, and measurement of the variables. Section 4 reports the results and Section 5 concludes the paper.

## 2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

Investors in the market consist of informed investors who can access private information and have a superior ability to analyze data, and individual investors who have the disadvantage of knowledge and skills to acquire and analyze data (Chen et al., 2011; Chung et al., 2020; Glosten & Milgrom, 1985; Gregoriou, 2013). Informed investors tend to be institutional investors because they can access private information through their trading processes with brokerage or investment banking companies (Hendershott et al., 2015; Park et al., 2014; Wang, 2021). Individual investors are uninformed as they lack this advantage (Chu et al., 2022; Chung & Wang, 2016; Kim et al., 2017) because their relationship with firms is more distant than that of institutional investors. This ability difference leads to varied behavior during information asymmetry-prone events (Atiase & Gift, 2015; Chen et al., 2019; Gregoriou, 2013; Kim et al., 2017). Kim et al. (2017) claim that individual investors differ from institutional investors in their ability to access and process information, and respond differently to analyst reports. Gregoriou (2013) shows that the information asymmetry cost component significantly increases around earnings announcements, and that the bid/ask spread increases after an earnings announcement, thus increasing information asymmetry. Theoretically, asymmetric information plays an important role in explaining the different changes in trading volumes (Chung & Wang, 2016). The informativeness effect asserts that traders can be informed differently by a new information release, and their trade will adjust to reflect these differences (Atiase & Gift, 2015). Both the asymmetric information and informativeness theories imply that trading volume changes during highly asymmetric information events, and traders revise their prior beliefs from upcoming information.

A growing body of literature indicates that earnings-related events produce asymmetric information in the market, because earnings announcements convey price-relevant information and have an exact schedule for investors (Ball, 1992; Ball & Brown, 1968; Chu et al., 2022; Gregoriou, 2013; Kim & Verrecchia, 1991). Ball and Brown (1968) and Kim and Verrecchia (1991) claim that earnings announcements, such as financial events, signal information about a firm's future value that can change investors' expectations of the firm's stock price and its investment return. Asymmetric information is substantially higher around earnings announcements (Chae, 2005). Kim and Verrecchia (1991) indicate that investors acquire private information to use in their trading both before and during earnings announcements. McNichols and Trueman (1994) found that information asymmetry increases prior to earnings announcements. Investors decrease their trading under high information asymmetry. Additionally, public information is positively correlated with trading volume (Admati & Pfleiderer, 1988; Mitchell & Mulherin, 1994), with a much higher frequency of trading around announcements (Chae, 2005; Mudalige et al., 2016; Nofsinger, 2001; Park et al., 2014). In conclusion, both informedness and asymmetric information yield a testable relationship between trading-volume changes and earnings announcements.

Traders are reluctant to trade (Admati & Pfleiderer, 1988; Chu et al., 2022). A decrease in trading volume or a negative abnormal trading volume finding indicates that, in these periods, traders will show less trading activity until the period of high uncertainty is resolved to mitigate an adverse selection problem (Chu et al., 2022; Mahipala et al., 2009). Negative trading volumes can also be explained by uninformed investors postponing their liquidity trading demand, as informed investors

anticipate increased market demand by informed investors (Chae, 2005). Consequently, in a period of high information uncertainty, the trading volume is lower than that in normal periods. As market participants have differing degrees of informational trading and capabilities (Hao et al., 2016), such periods create varying trading behaviors between investors who offer better information and those who offer less information. In other words, uninformed investors make fewer trades relative to their expected trading volume to avoid information disadvantages that may lead to wrong decision making (Akerlof, 1970; Wang, 1994), and this lower volume should be greater than that of more informed investors.

According to the informativeness theory, after information uncertainty is resolved after the earnings announcement date, traders update their prior knowledge of earnings, and the negative abnormal volume disappears. Each trader type updates its trade according to its information processing capabilities (Atiase et al., 2005; Kim & Verrecchia, 1991). According to the asymmetric information theory, the adverse selection cost is lower after information is released, and traders will increase their orders to compensate for their postponed trades in the pre-announcement period (Chae, 2005; George et al., 1994). We hypothesize the existence and direction of the changes in trading volumes for both investor groups as follows:

**Hypothesis 1:** Both individual and institutional investors have significant abnormal trading volume around earning announcements.

**Hypothesis 2:** Both individual and institutional investors will show lower trading volume before an earnings announcement and higher trading volume after an earnings announcement.

We further test how and what type of information affects trading volume. Specifically, we examine earnings surprise information and price change information observed by investors on earnings announcement dates, and test their effect on trading volume one day after the announcement. Based on the informativeness effect, traders adjust their trades according to how informed they are. They trade differently because they have different interpretations of magnitude (Atiase & Gift, 2015; Kim & Verrecchia, 1991). The interpretation of earnings information varies among investors (Ahmed et al., 2009; Bamber et al., 1999; Kandel & Pearson, 1995). Earnings surprise magnitude information represents historical information. They stem from financial statements and reflect changes in a company's financial health or operational efficiency. This type of information is crucial for retail investors who may rely more heavily on reported earnings. Investors with superior processing capabilities interpret earnings surprises differently than others, and their trade varies according to the degree of perceived surprise.

On announcement dates, market price information serves as an informative signal for investors (Choy & Zhang, 2021; Engelberg et al., 2012; Glaser & Weber, 2009). Price informational efficiency has a significant impact on the capital market and is used to test its contribution to trading behavior (Ball, 1992; Boehmer & Wu, 2013; Chambers & Penman, 1984). Extant research argues that trading by informed investors, such as short sellers, impacts market price information (Boehmer & Wu, 2013; Choy & Zhang, 2021). Our study supports this idea and is consistent with the findings of previous studies. The market price on event dates incorporates information perceived by traders and affects the trading volume after the announcement date. Market prices on event dates are considered a reflection of market participants' collective opinions regarding earnings announcements, and are an informative signal of trading behavior (Choy & Zhang, 2021).

**Hypothesis 3:** For both individual and institutional investors, the higher of magnitude earning changes, the higher abnormal trading volume.

**Hypothesis 4:** For both individual and institutional investors, the stock returns on the earnings announcement date is positively related to trading volume on the day after.

## 3. DATA AND METHODOLOGY

### *3.1. Data*

We obtained data on the trading volume of each stock from either group of investors from the SET under a special market microstructure study program. Using this unique dataset, we aggregate intraday volume data into daily volumes and separately examine the trading volume for both institutional and retail investors. Thai market traders include local individual investors, local institutional investors, proprietary traders, and foreign investors. To prevent unambiguous results arising from illiquid and home bias effects (Yao, 2014), we exclude foreign and proprietary trade from our test. We select local individual and institutional investors for the analysis, and call them individual and institutional investors, respectively. Quarterly earnings announcements of firms listed on the SET50 index from 2012 to 2015 were selected as the event study

sample. We exclude announcements that include other events such as dividends, acquisitions, and credit ratings in the same announcement period. The sample consisted of 35 listed companies with 338 firm-event observations. We collected data on firm characteristics, announcements, returns, high-low prices, average trading prices, and market trading volumes from the DATASTREAM database.

***Table 1: Sample Selection Criteria.***

| | **Firm-Event** |
|---|---|
| Listed companies on SET50 index | 800 |
| Deduct Listed firms not remain in SET50 during 2012 to 2015 | 240 |
| Deduct Observations with inadequate data to calculate expected volumes | 46 |
| Deduct Observations with stacked event(s)* | 176 |
| **Observations for analyses** | **338** |

**Note:** *Stacked Events Include Dividends, Acquisitions, Or Credit Ratings Announced During the Same Announcement Period

### *3.2. Methodology*

This study consists of two parts: an event study and regression analysis. First, we select quarterly earnings announcements as proxies for information asymmetry. The estimation period is -35 to -6 and the event period is -5 to 5, relative to the announcement on day 0. We calculate the expected trading volume from the trading volume data in the estimation period by using the constant mean model to test the abnormal trading volume during the event period.

We then conduct a regression analysis using the most significant abnormal volume after the announcement date from the event study as the dependent variable and earnings changes and stock returns on the announcement date as independent variables to test whether the event date's stock returns or earnings surprises influence investors' trading behavior.

### *3.3. Data Description and Measurement*

#### *3.3.1. Event Study Variables*

To capture the reaction of each investor group to selected events, we develop a full-day trading volume by aggregating all buy and sell volumes for a firm over the course of a day for domestic institutional and individual investor groups, as follows:

$$TV_{git} = \frac{Buy_{git} + Sell_{git}}{S\square are_{it}},$$

where $TV_{git}$ denotes the full-day trading volume of investor group $g$ on firm $i$ on day $t$, $Buy_{git}$ and $Sell_{git}$ denote net buy and net sell, respectively; and $S\square are_{it}$ is the total common stock of the firm. Total trading volume is used instead of net trading, as the latter shows the same value when changes in volume for buy and sell occur at the same magnitude, revealing no meaningful interpretation of the volume changes. The data for $TV_{git}$ data are also normalized using the total common share of each firm, which makes them comparable across firms.

#### *3.3.2. Abnormal Trading Volume (Constant Mean Model)*

To investigate the information asymmetry between the two groups, we calculate the abnormal trading volume to measure how investors in each group trade more or less than usual. In other words, it is a comparison with the expected trading volume (MacKinlay, 1997).

$$\bar{V}_{gi} = \frac{1}{T}\sum_{T=f}^{T=l} TV_{git}$$

where $\bar{V}_{gi}$ is the expected trading volume, based on the average full-day trading volume during the estimation period. Thus, the abnormal trading volume $AV_{git}$ is

$$AV_{git} = TV_{git} - \bar{V}_{gi}.$$

For groups of events, we determine the average abnormal trading volume for each day around the announcement period, as follows

$AAV_{gte} = \frac{1}{n}\sum_{e=1}^{n} AV_{gte}$.

We further computed the mean on the pre-event dates from day -5 to day-1 as

$$\overline{AAV_{gte,pre}} = \sum_{T=-5}^{T=-1} AAV_{gte,T}.$$

For the post-event dates, we averaged the $AAV_{gte}$ for days *t*+1 to *t*+5:

$$\overline{AAV_{gte,post}} = \sum_{T=+1}^{T=+5} AAV_{gte,T}.$$

#### *3.3.3. Regression Analysis Variables*

**Dependent Variable:** We apply the abnormal trading volume on the day after the announcement (*t* = 1) as the dependent variable in our regression models, because the abnormal volumes on this day are the highest relative to other days around

quarterly earnings announcements.

**Independent Variables:** The first independent variable is the absolute percentage of quarterly earnings change (*ABSERN*), which is the absolute percentage change in a firm's quarterly net profit compared to the same quarter of the last fiscal year. This is computed as

$$ABSERN = \left|\frac{Quarterly\ Net\ Profit_t - Quarterly\ Net\ Profit_{t-1}}{Quarterly\ Net\ Profit_{t-1}}\right|.$$

The second independent variable is stock returns on the announcement date (*RETURN0*), which we obtain from DATASTREAM for the announcement date ($t$ = 0).

**Control Variables:** Since investors tend to weigh more negative than positive earnings surprises (Shin, 2019), we include a dummy variable for negative earnings (*DNERN*), which equals 1 if the earnings change is negative and 0 otherwise.

**Second, we include the bid/ask spread on the announcement date (*SPD0*) calculated from the high and low share prices on the announcement date:**

$$SPD0 = \frac{H_{t=0} - L_{t=0}}{(H_{t=0} + L_{t=0})/2}.$$

We include the average traded share price on the announcement date (*AVERAGE0*) obtained from the SETSMART database. The control variables include firm size (*SIZE0*), calculated as the natural logarithm of a firm's market capitalization on the announcement date; trading volume (*MKVOL1*), calculated as the natural logarithm of market trading volume on the day after the announcement date ($t$=1); and abnormal trading volume on the announcement date (*INSTRADE0)* and one-day lag abnormal trading volume (*INDTRADE1*), calculated as the 1-day lagged value of the dependent variables.

## 4. EMPIRICAL RESULTS AND DISCUSSION

### *4.1. Abnormal Trading Volume and Trading Patterns Around Earnings Announcements*

Table 2 shows descriptive statistics for the daily trading volumes of institutional and individual investors. As the Thai market consists mainly of individual investors, they show higher trading volumes than institutions do over the course of the sample period.

***Table 2: Descriptive Statistics of Daily Trading Volume of Sample Stocks.***

| Period | n | Investors | Mean | SD | Min | Max |
|---|---|---|---|---|---|---|
| 2012 | 8,540 | Institutions | 1,059.26 | 1,438.10 | 0.33 | 34,996.60 |
| | | Individuals | 2,848.24 | 4,881.04 | 22.90 | 87,936.93 |
| | | | | | | |
| 2013 | 8,575 | Institutions | 1,810.81 | 2,060.21 | 23.52 | 36,569.18 |
| | | Individuals | 2,977.84 | 5,660.35 | 37.46 | 81,578.26 |
| | | | | | | |
| 2014 | 8,575 | Institutions | 1,298.37 | 1,360.45 | 18.27 | 32,269.94 |
| | | Individuals | 2,119.79 | 3,925.68 | 10.87 | 119,605.17 |
| | | | | | | |
| 2015 | 8,505 | Institutions | 1,299.62 | 1,308.69 | 14.10 | 19,498.67 |
| | | Individuals | 1,726.04 | 2,543.58 | 20.58 | 38,062.02 |

**Note:** This Table Reports the Descriptive Statistics of The Daily Trading Volumes For 2012 – 2015. We Denote N As the Number of Days During This Period, Mean as The Average Trading Volume, SD As the Standard Deviation, Min as The Minimum Trading Volume, And Max as The Maximum Trading Volume. The Daily Trading Volume Is Calculated as In Section 3.3, And Is Shown As $10^6$ Multiplications. These Data Were Aggregated From 35 Listed Firms and Remained on SET50 Between 2012 And 2015.

Table 3 reports the results of the event study using the constant mean method for expected trading volumes around the 338 events and the abnormal trading volumes for each group of investors around earnings announcements (-5,5).

***Table3: Average Abnormal Trading Volume Around Earnings Announcement.***

| Relative Day | Institutions | | Individuals | |
|---|---|---|---|---|
| | AAV | *t- statistics* | AAV | *t- statistics* |
| -5 | -70 | *-1.20* | -300** | *-2.15* |
| -4 | -160*** | *-2.90* | -320** | *1.97* |
| -3 | -100 | *-1.89* | -240 | *-1.93* |
| -2 | -190*** | *-2.97* | -400** | *-2.18* |
| -1 | -150** | *-2.44* | -120 | *-0.49* |
| 0 | -20 | *-0.32* | 202 | *0.75* |
| 1 | 551*** | *5.96* | 1050*** | *5.22* |
| 2 | 301*** | *3.43* | 614*** | *2.61* |
| 3 | 190** | *2.08* | 340 | *1.82* |

| | | | | |
|---|---|---|---|---|
| 4 | 11 | *0.16* | -50 | *-0.26* |
| 5 | 32 | *0.37* | 253 | *1.00* |
| Pre-announcement (Average -5, -1) | -130*** | *-5.15* | -280*** | *-3.51* |
| Post-announcement (Average 1, 5) | 217*** | *5.62* | 443*** | *4.63* |

**Note:** (1) AAV, Average Abnormal Volume, Shown As $10^6$ Multiplications; (2) *T*-Stat of $H_0$ AAV Is Not Different From 0; (3) ** And *** Indicate Significance at the 0.05 And 0.01 Levels, respectively.

Institutional and individual investors share similar trading patterns around their earnings announcements. As the average abnormal volume (AAV) values show, both groups had negative AAV in the pre-announcement period, followed by positive AAVs in most of the post-announcement period. For the pre-announcement period, the AAV of individual investors shows statistical significance from $t$ = -5, while institutional investors start from $t$ = -4. Thus, both investor groups significantly reduce their trading prior to the event.

In the post-announcement period, both investor types significantly increase their trading activity. The day after the announcement is the most active day, showing AAVs of 551 from institutional investors and 1,050 from individuals, with *t*-statistics of 5.96 and 5.22, respectively. This result confirms that quarterly earnings announcements affect institutional and individual investors' trading behavior during the announcement period. Another interesting point is that on the announcement date, the AAV value of institutional investors is still negative in the pre-announcement period at -20, while that for individual investors reverses to positive at 202. However, this difference was not statistically significant. To illustrate the trading patterns around earnings announcements more clearly, we chart the results in Table III as the cumulative values in Figure 1.

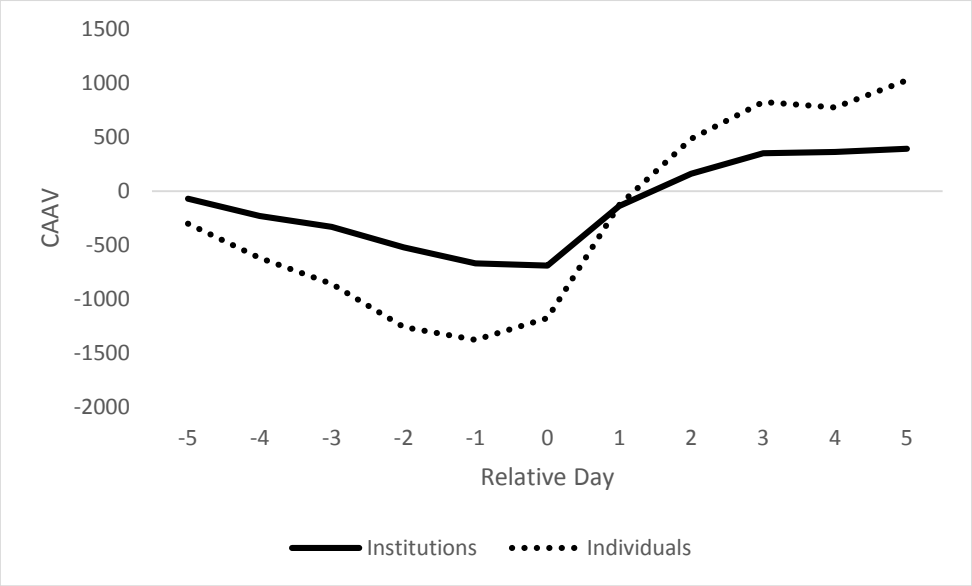


***Fig. 1: Cumulative Average Abnormal Volume (CAAV).***

**Note:** The x-axis represents the event window, spanning from day -5 to day +5 relative to the announcement date (day 0). The y-axis shows the cumulative average abnormal volume (CAAV), ranging from -2000 to 1500, measured in units of millions of shares traded.

These results imply that both individual and institutional investors can time the announcements of scheduled events. Both investor groups trade with similar patterns when exposed to a high information asymmetric data period. Trading volume declined in the days prior to the announcement, with both institutional investors (solid line) and individual investors (dashed line) showing values below zero from day -5 to day -1. After the resolution of the asymmetric information period, trading volume increased for both groups.

The results of the *t*-statistic tests in Section 4.1 enable us to indicate that: 1) both institutional and individual investors show abnormal trading volumes around earnings announcements, and 2) both groups of investors decrease their trading volume before quarterly earnings announcements and then increase it thereafter. Thus, hypotheses 1 and 2 are accepted.

As expected, these results are consistent with theory and prior studies on information asymmetry in the market. The first is signaling theory (Ball & Brown, 1968; Beaver, 1968; Kim & Verrecchia, 1991), which states that asymmetric information exists

between insiders and outsiders. Thus, a public announcement, or, in this case, a quarterly earnings announcement, is considered a signal from insiders who have superior information, and provokes abnormal trading behavior from outside investors who have less information.

The second problem is the adverse selection problem (Akerlof, 1970; Glosten & Milgrom, 1985; Wang, 1994). Because quarterly earnings announcements are scheduled financial events, outsiders or investors can recognize their upcoming information disadvantages and decrease their trades to avoid adverse selection problems. When information is announced, the adverse selection problem from the event is eliminated and investors increase their trading.

### *4.2. The Effect of Quarterly Earnings Announcements on Investors*

According to the event study results in Section 4.1, the highest significant abnormal volumes (AAV is the most different from 0) always occur on the day after the announcement ($t = 1$). Consequently, we select abnormal trading volume on $t = 1$ as a proxy for investors' trading behavior after receiving earnings information, and test the effect of quarterly earnings announcements on institutional and individual investors through the following regression:

$$AV = \propto + \beta_1 \text{ABSERN} + \beta_2 \text{RETURN0} + \gamma' X_{1-4} + \varepsilon \quad (1)$$

where AV is abnormal trading volume from both institutional and individual investors on the day after the announcement, *ABSERN* is the absolute percentage of earnings change compared to the same quarter of the last fiscal year, *RETURN0* is the stock return on the announcement date, $X_{1-6}$ represents the control variables (*DNERN*, *SPD0*, *AVERAGE0*, *SIZE0*, *MKVOL1*, *INSTRADE0*, and *INDTRADE0*), $\gamma'$ is the coefficient of the control variables, consisting of $\gamma_1 - \gamma_6$ and $\varepsilon$ is an error term.

We provide the descriptive statistics of all variables, their correlation coefficients, and the regression results in Tables 4, Table 5, and Table 6.

***Table 4: Descriptive Statistics.***

| | Mean | Median | Maximum | Minimum | SD |
|---|---|---|---|---|---|
| **INSTRADE1** | 550.81 | 122.11 | 11550.31 | -3274.88 | 1698.03 |
| **INDTRADE1** | 1053.65 | 1053.65 | 35994.59 | -8030.46 | 3708.36 |
| **ABSERN** | 0.87 | 0.23 | 44.09 | 0.00 | 3.05 |
| **RETURN0** | 0.01 | 0.00 | 12.02 | -13.14 | 2.02 |
| **SPD0** | 2.46 | 2.16 | 11.47 | 0.63 | 1.33 |
| **AVERAGE0** | 87.83 | 48.04 | 539.97 | 0.78 | 95.91 |
| **SIZE0** | 11.88 | 11.65 | 10.29 | 13.90 | 0.86 |
| **MKVOL1** | 22.84 | 22.77 | 24.53 | 21.67 | 0.51 |
| **INSTRADE0** | -23.80 | -160.32 | 12856.67 | -4794.26 | 1384.94 |
| **INDTRADE0** | 202.47 | -223.83 | 73283.95 | -10756.87 | 4989.99 |

**Note:** This Table Contains a Summary of Descriptive Statistics for All Analysis Variables, With Non-Missing Data From 255 Firm-Event Observations. INSTRADE1 = Abnormal Trading Volume of Domestic Institutions For T=1. INDTRADE1 = Abnormal Trading Volume of Individual Domestic Investors At T=1. ABSERN = Absolute Percentage of Earnings Change Compared with The Same Quarter of The Previous Fiscal Year. RETURN0 = Return on Announcement Date (T =0). SPD0 = Spread on The Announcement Date (T=0). AVERAGE0 = Average Share Price on The Announcement Date (T=0). SIZE0 Is the Natural Logarithm of Market Capitalization on Announcement Date (T=0). MKVOL1 = Natural Logarithm of The Market Trading Volume At T=1.

***Table 5: Correlation Coefficient.***

| | INSTRADE1 | INDTRADE1 | ABSERN | RETURN0 | SPD0 | AVERAGE0 | SIZE0 | MKVOL1 | INSTRADE0 | INDTRADE0 | VIF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **INSTRADE1** | 1.0000 | | | | | | | | | | |
| **INDTRADE1** | 0.6631*** | 1.0000 | | | | | | | | | |
| **ABSERN** | 0.0942 | 0.1230** | 1.0000 | | | | | | | | 1.0247 |
| **RETURN0** | 0.0429** | -0.0004 | 0.0373 | 1.0000 | | | | | | | 1.0479 |
| **SPD0** | 0.1149** | 0.2614*** | 0.0158 | 0.1095** | 1.0000 | | | | | | 1.6411 |
| **AVERAGE0** | -0.1213** | -0.1256** | -0.1192** | 0.0613 | -0.2348*** | 1.0000 | | | | | 1.7502 |
| **SIZE0** | 0.0582 | -0.0035 | -0.1248** | -0.0552 | -0.2229*** | 0.6294*** | 1.0000 | | | | 1.7601 |
| **MKVOL1** | 0.0373 | 0.0479 | -0.0720 | 0.0403 | -0.0423 | 0.0613 | 0.1684*** | 1.0000 | | | 1.0410 |
| **INSTRADE0** | 0.4136*** | 0.3385*** | 0.0010 | 0.0514 | 0.3639*** | -0.0085 | 0.0206 | -0.0251 | 1.0000 | | 1.2817 |
| **INDTRADE0** | 0.1758*** | 0.3059*** | -0.0246 | -0.0017 | 0.5492*** | -0.0149 | -0.0390 | -0.0248 | 0.4355*** | 1.0000 | 1.6148 |

**Note:** ** And *** Indicate Significance at the 5%, And 1% Levels, respectively. INSTRADE1 = Abnormal Trading Volume of Domestic Institutions For T=1. INDTRADE1 = Abnormal Trading Volume of Individual Domestic Investors At T=1. ABSERN = Absolute Percentage of Earnings Change Compared with The Same Quarter of The Previous Fiscal Year. RETURN0 = Return on The Announcement Date (T=0); AVERAGE0 = Average Share Price on The Announcement Date (T=0). SIZE0 Is the Natural Logarithm of Market Capitalization on Announcement Date (T=0). SPD0 = Spread on The Announcement Date (T=0). MKVOL1 = Natural Logarithm of Market Trading Volume At T=1. Variance Inflation Factor (VIF) Is A Test for The Multicollinearity Problem

*Table 6: Regression Analysis.*
*Models Indicate Trading Behavior of Domestic Institutions and Domestic Individual Investors.*

| Model | INSTRADE1 | | INSTRADE1 | |
|---|---|---|---|---|
| **Intercept** | -5405.523 | -5740.926 | -11162.310 | -11347.850 |
| | (0.299) | (0.276) | (0.191) | (0.184) |
| **ABSERN** | 52.125 | 51.249 | 147.311** | 146.783** |
| | (0.306) | (0.325) | (0.022) | (0.025) |
| **RETURN0** | | 64.242** | | 38.794 |
| | | (0.044) | | (0.793) |
| **DNERN** | 136.678 | 163.002 | 131.059 | 145.433 |
| | (0.453) | (0.382) | (0.778) | (0.771) |
| **SPD0** | -90.566 | -100.958 | 256.344 | 246.656 |
| | (0.254) | (0.209) | (0.392) | (0.390) |
| **AVERAGE0** | -3.871 | -4.048** | -5.588 | -5.702 |
| | (0.059) | (0.045) | (0.245) | (0.222) |
| **SIZE0** | 362.353** | 374.453** | 430.452 | 437.615 |
| | (0.014) | (0.015) | (0.248) | (0.243) |
| **MKVOL1** | 137.255 | 149.447 | 318.821 | 325.917 |
| | (0.498) | (0.466) | (0.354) | (0.345) |
| **INSTRADE0** | 0.534*** | 0.530*** | | |
| | (<.0001) | (<.0001) | | |
| **INDTRADE0** | | | 0.180 | 0.181 |
| | | | (0.387) | (0.396) |
| | | | | |
| **Quarter Fixed** | Yes | Yes | Yes | Yes |
| **Year Fixed** | Yes | Yes | Yes | Yes |
| **Industry Fixed** | Yes | Yes | Yes | Yes |
| | | | | |
| **R-square** | 0.249 | 0.254 | 0.169 | 0.170 |
| **F-statistic** | 5.540*** | 5.400*** | 3.420*** | 3.250*** |
| **Obs** | 338 | 338 | 338 | 338 |

**Note:** ** And *** Indicate Significance at the 5% And 1% Levels, respectively. INSTRADE1 = Abnormal Trading Volume of Domestic Institutions For T=1. INDTRADE1 = Abnormal Trading Volume of Individual Domestic Investors At T=1. ABSERN = Absolute Percentage of Earnings Change Compared with The Same Quarter of The Previous Fiscal Year. RETURN0 = Return on Announcement Date (T =0). DNERN = Dummy Variable for Negative Earnings Changes. SPD0 = Spread on The Announcement Date (T=0). AVERAGE0 = Average Share Price on The Announcement Date (T=0). SIZE0 Is the Natural Logarithm of Market Capitalization on Announcement Date (T=0). MKVOL1 = Natural Logarithm Of Market Trading Volume At T=1. INSTRADE0 = Abnormal Trading Volume of Domestic Institutions on Announcement Date. INDTRADE0 Is the Abnormal Trading Volume of Domestic Individual Investors on Announcement Date. N = 338 For Each Model.

The regression results in Table 6 show the outstanding disparities between institutional and individual investors. First, the one-day lag abnormal trading volume (*INDTRADE1)* has a positive correlation with the absolute percentage of earnings changes (*ABSERN*) at the 5% significance level, whereas there is no significant relationship between *INSTRADE1* and *ABSERN*. The mean abnormal trading volume for individual investors on the day after the announcement depends on released earnings information. In other words, individual investors traded on earnings information, whereas institutional investors did not. Therefore, Hypothesis 3 is accepted for individuals but not for institutional investors. The fact that individual investors are provoked by published earnings information is consistent with Hakansson (1977) explanation that uninformed investors with limited processing abilities and resources make their investment decisions based on public information, whereas informed investors who have greater abilities and resources account for pre-disclosure information.

Second, institutional investor trading relates to stock returns on announcement dates, whereas individual investors do not. *INSTRADE1* was positively correlated with *RETURN0* at the 5% significance level. This relationship shows that when the share price increases, a positive return occurs on the announcement date, and institutions trade more the day after, suggesting that institutional investors trade based on market reactions rather than on earnings information. Thus, Hypothesis 4 is supported by institutions. This relationship provides evidence that not only earnings news but also market reactions to earnings information affect investors' trading behavior, especially investors who can predict earnings information (Choy & Zhang, 2021).

Third, we find significant relationships between the abnormal trading volume of institutions and AVERAGE0 and SIZE0 but no such relationship with

abnormal trading volume from individual investors. *AVERAGE0* was negatively correlated with *INSTRADE1* at a 5% significance level. Thus, stocks with lower average trading prices on the announcement date ($t$ = 0) render more trading volume from institutional investors on the day after ($t$=1). Company size (*SIZE0*) also drives abnormal trading among institutional investors. It displays an increasing function related to trading volume at the 5% significance level. This implies that, in the Thai market, large companies draw more investor attention, and consequently, a significant abnormal trading volume after earnings information is announced. Our results differ from those of previous studies (Atiase, 1985; Bamber, 1987; Llorente et al., 2002) which argue that large firms cause fewer asymmetric information problems and should lower the abnormal trading volume around scheduled quarterly earnings announcements. The abnormal trading volume of institutional investors on the announcement date (*INSTRADE0*) is the 1-day lagged value of the dependent variable (*INSTRADE1*), which has a positive relationship with a strong significance level at the 1% level. This means that the abnormal trading volume of institutions on the announcement date influences abnormal trading the next day.

These results illustrate different trading ideas of institutions and individuals when quarterly earnings information is available. After announcements, individual investors' abnormal trading is influenced solely by the magnitude of the earnings changes. In contrast, abnormal trading by institutions is not related to earnings information, but depends on returns on the announcement date, which is the price response to earnings disclosure.

Moreover, these regression results indicate why the trading volumes on announcement dates differ for each investor group. As shown in Table 3, at $t$ = 0, institutions are still in a negative average abnormal trading position at AAV = -20. They behave in the same way as in the pre-announcement period because the information they want, the stock price response, comes at the end of the announcement date. Thus, they begin to increase their trading volumes the next day (t = 1). Individuals turn their average abnormal trading volume on announcement date to a positive position at AAV = 202 because they have already received the information, they want during day t = 0, which is earnings disclosure.

These trading behaviors can also be explained using the conventional theory of heterogeneous investors, which posits that individual investors are less informed than institutional investors (Chen et al., 2019; Chung et al., 2014; Funaoka & Nishimura, 2019; Hendershott et al., 2015; Nofsinger, 2001). Institutional investors can accurately forecast earnings announcements with improved information access and processing capabilities. Thus, when actual earnings information is announced, it has less of an impact on institutions that can anticipate the information, whereas it impacts individual investors who are uninformed. Instead, the price response, which reflects market participants' consensus regarding disclosed earnings information, is nearly unpredictable. Thus, the price response signal has a greater impact on institutional investors' trading decisions on the day after announcements than on their earnings information does.

## 5. CONCLUSION AND DISCUSSION

This study examines the effects of quarterly earnings announcements on investors' trading behavior on the Stock Exchange of Thailand (SET), using data on securities listed in the SET50 index between 2012 and 2015. We selected quarterly earnings announcements of these listed firms to observe changes in the daily trading volumes of the two investor groups in the event study. The results indicate that both investor groups have similar trading patterns around the quarterly earnings announcements. Individual and institutional investors decrease their trading volumes before and increase them after earnings announcements. These trading behavior patterns are consistent with asymmetric information theory, the informedness effect, and previous studies (Atiase & Gift, 2015; Chae, 2005; Mahipala et al., 2009). We confirm their studies and show that uninformed investors increase their trading after the adverse selection problem is resolved, that is, they lower the cost of adverse selection, while informed investors trade more normally in the post-announcement period.

Our results strengthen prior results and conjecture in the literature that uninformed investors reduce their trading activities when the market has greater information asymmetry (Mudalige et al., 2016; Nofsinger, 2001; Park et al., 2014)

We further show that the different types of information on earnings announcement dates–earnings surprise or market returns information–impact the abnormal trading volume one day after earnings announcements in different ways. For individual investors, disclosed earnings information drives abnormal trading behavior after announcements. In contrast, earnings changes do not influence institutions' abnormal trading, but the market reaction in terms of stock price response to

earnings announcement dates does. Our results favor the information content of the market price response to earnings announcements for institutional investors and unfavored accounting or history-based earnings surprise information for more informed investors.

For investors, this finding may be fruitful when they observe price changes or returns on the earnings announcement date, rather than only observing earnings surprise data. For market supervisors, the results provide a better understanding of the source of high market volatility when the market is in a high information asymmetry period.

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