INFORMATION ASYMMETRY, TRADING VOLUME AND RETURNS IN THE MALAYSIAN STOCK MARKET

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Abstract: This paper examines investors' motive to trade on the Malaysian stock market from 1st July 1997 to 30th June 2005. By applying ordinary least square (OLS) to 272 stocks as well as in three size groups, both the time series and cross-sectional results indicate that speculation on firm specific asymmetric information is the primary motive to trade on Malaysian stock market for the full and two sub-sample periods. The results show that most of the investors in Malaysian stock market tend to speculate firm related information to maximize their profits. The findings of this study provide important implications to policy makers in addition to investors in this developing market. Proper management of foreign portfolio investment is crucial to prevent manipulative moves and excessive speculative forms of portfolio investments that may cause excessive surges of inflows and massive panic outflows of short-term capital and thus collapse the financial system and downturn economy.

Keywords: information asymmetry, returns, volume, foreign portfolio investment

1

1.0 INTRODUCTION

The efficient market and existence of asymmetrically distributed information have been concerned by many researchers. In an efficient market, information is impounded into security prices with such speed that there are no opportunities for investors to profit from publicly available information. Security prices are set as the resolution of differences in the valuation assessments on the information about a firm of investors in a market. Though there is evidence in support of this efficient market hypothesis, there is also evidence that financial markets are not completely efficient. Blume, Easley and O'Hara (1994) and Suominen (2001) investigated the information content of volume on financial markets. They suggested that stock prices are noisy and cannot convey all available information to market participants and that volume could be used as an informative statistic. Therefore, the linkage of stock prices, trading volume and information set is a central issue in the study of financial markets.

Information extracted from volume depends on the investors' motives to trade, either to rebalance their portfolios for risk sharing or to speculate on market or their firm-specific information. Different motives to trade result in different return dynamics. Information asymmetry causes markets to become inefficient, since not all the market participants have access to the information they need for their decision making processes. This is particularly important to Malaysia as an emerging market which is differentiated from developed markets with respect to their heterogeneous nature and inherent dynamics. Malaysian stock market has relatively smaller trading volume and less well-informed investors with access to inaccurate information about the market as well as a particular firm.

As the 1990s, many emerging economies and financial markets grow rapidly and open to foreign investors. These emerging market stocks have attracted considerable research interest for evaluating the benefits of investing in these markets. This paper is motivated to investigate the time serial and cross-sectional variations in the relation between trading volume and return in Malaysian stock market, with particular attention to the relative impact of firm-specific hedging trade versus speculative trade on stock returns in three size groups of individual stocks.

This paper is organized as follows: Section 2.0 provides a review of relevant literature. Following this literature review, a brief description on the data and methods used in this study is given in Section 3.0. This is then followed in Section 4.0 by an analysis and discussion of the results. Concluding remarks are given in Section 5.0.

2.0 LITERATURE REVIEW

There is a general understanding in financial research that price and volume are inherently related in financial markets. The two well-known hypotheses which explain the predictive power of trading volume for future returns and suggest that volume and price are jointly determined are the mixture of distributions hypothesis (MDH) and the sequential

information arrival hypothesis (SIAH). The MDH of Clark (1973) explained the linking price change, volume and the rate of information flow. It implied only a contemporaneous relationship between volume and (absolute) returns as information dissemination was contemporaneous. Copeland (1976) developed a simple sequential information arrival model in which the information was received by one trader at a time, and each trading on this information before it became known to anyone else. This hypothesis implied the continuation of higher volatility after the initial information shock rather than spikes in volatility.

Further studies have been extended to the relation between return dynamics and trading volume which indicating that the volume-return relation depends on trade volume as well as motives of traders. The first contribute on speculative trading can be considered Epps (1975) who formalized and modeled two Wall Street. Two old Wall Street adages that volume to make prices move, and volume is relatively heavy in bull markets and light in bear markets.

Wang (1993) suggested that large trading volume appeared to induce negative return autocorrelations when liquidity was the main motive of traders. Also, he demonstrated that these autocorrelations will be positive if speculation is the primary motive of traders. He showed that informational trading and noninformational trading could lead to different dynamic relations between trading volume and stock returns. Therefore, trading volume may provide information about expected future returns and was always positively correlated with absolute prices changes, and the correlation increased with information asymmetry.

Roll (1988) investigated the explanatory power of the stock price changes which should be explained by the general market influence, industry influence and firm-specific events. Using 96 largest stocks in United States (U.S.), he found that less than forty percent of the return volatility of the stocks explained by the asset pricing models. He explained this as a result of existence of the firm-specific information and occasional frenzy unrelated to concrete information.

Llorente, Michaely, Saar and Wang (2002) showed that dynamic return and volume was a function of information asymmetry. They investigated the volume-induced return autocorrelation with the level of disclosed insider trading using a theoretical model with heterogeneously informed agents over sample period of 1 January 1993 to 31 December 1998. They found that daily returns generated by risk-sharing trades were more likely to reverse themselves and daily returns generated by speculative trades were more likely to continue themselves on NYSE and American Stock and Options Exchange (AMEX). They also showed that firm-specific information asymmetry was the driving force behind the relation of volume and return.

Ryan and Taffler (2004) found that at least 65% of significant price changes and trading volume movements are explained by public domain information using a sample of all industrial companies in the Financial Times Stock Exchange (FTSE) 100 and FTSE Mid-250 indices (excluding financials) for a period of two years from 1st January 1994 to

31st December 1995. They concluded that firm-specific information events drove economically relevant positive and negative stock price changes and trading volume.

There are differences between the stock markets in established advanced economies and stock markets in the emerging economies in terms of types of governmental policies and tools to manage as well as the degree of governmental intervention in financial issues. Stock markets in emerging economies are relatively new, under-regulated and often segmented. Therefore, investors' responses to public announcements by firms in emerging economies may differ from responses in developed economies' stock markets. Chang, Cheng and Khorana (2000) used periods range from 180-month data from January 1981 to December 1995 for Hong Kong to 420-month data from January 1963 to December 1997 for the U.S. to examine herd behavior in five equity markets, namely U.S, Korea, Taiwan, Hong Kong and Japan. They demonstrated that stock prices of the four Asian markets tended to move by the investor psychology and general economy-related information rather than by firm-specific information that affects the expected future cash flows of individual stocks.

Bhattacharya, Daouk, Jorgenson, and Kehr (2000) used two-year daily data of bid, ask and transaction prices as well as volume traded of 49 stocks from July 1994 through June 1996 to study the level of efficiency of Mexican stock market. They found no unusual market reactions to the public announcement of firm-specific information and concluded that the firm-specific information pricing was not efficient in the Mexican stock market. This was due to information leakages where prices fully incorporated the information before its public release and thus making it a non-event.

3.0 DATA AND METHOD

The raw data of the study is obtained from Thomson Financial Datastream database. The sample data consists of an eight (8) years of daily data of 272 individual firms from 1st July 1997 to 30th June 2005. In addition to the full sample period, the study is also further divided into two sub-sample periods, namely crisis period (1st July 1997 to 30th June 2000) and post control period (1st July 2000 to 30th June 2005). Total population of 983 firms is listed on main board and second board of Bursa Malaysia during the sample period. All selected firms must meet all criteria as follows:

1. Listed on Bursa Malaysian prior to or on 1st July 1997 and continuously listed for 8 years to 30th June 2005
2. Trade in at least two-thirds of the days for both the full and sub-sample periods
3. Not a Practice Note 4 (PN4) or Practice Note 17 (PN17) company
4. Data required is available

These requirements reduced the sample size to 272 firms. All stocks in both the full and sub-sample periods are categorized into three subgroups according to firm size. The firm's price will be automatically adjusted for stock splits and other capital changes as the decrease in price is offset by an increase in the number of shares outstanding, thus causing

the total market value remains unchanged. To obtain the stationary series, the individual stock price is transformed into return using the following formula:

$$R_{i,t} = LN (P_{i,t}/P_{i,t-1})$$
(1)

Where stock return ($R_{i,t}$) is the differences of logarithm of firm i's closing price (P) on day (t) and closing price day (t-1).

Detrended logarithm turnover is used to obtain stationary series. $V_{i,t}$ is the daily firm's trading volume measured as daily detrended logarithm turnover. Following Llorente et al. (2002), a firm's trading volume formula ($V_{i,t}$) is:

$$V_{i,t} = \ln(turnover_{i,t} + 0.00000255) - [(1/200)\sum_{j=1}^{200}\ln(turnover_{i,t-j} + 0.00000255)]$$
(2)

Where turnover$_{i,t}$ is the differences of logarithm of firm i's total number of shares traded on day (t) and total of shares outstanding. Small constant (0.00000255) is added before taking logarithm to avoid zero daily trading volume. Then, the series is detrended by subtracting a 200 trading day moving average.

Market capitalisation is used to be proxy for information symmetry which is linked to the degree of information production in the market. A firm's market capitalisation ($CAP_{i,t}$) formula is:

$$CAP_{i,t} = SO_{i,t} \text{ x } P_{i,t}$$
(3)

Where firm i's market capitalisation ($CAP_{i,t}$) is defined as firm i's shares outstanding (SO) multiplied by closing price (P) on day (t).

The daily firm-specific stock return and volume are then constructed by decomposing both the volume and return series into a systematic (market) component and nonsystematic (firm-specific) component (Durnev, Morck, Yeung and Zarowin, 2003). The firm-specific return is obtained by regressing firm's return on day t ($r_{i,t}$) on market return and its sector return on day t, $r_{m,t}$ and $r_{j,t}$, respectively, as follows:

$$r_{i,t} = c_0 + c_1 r_{m,t} + c_2 r_{j,t} + \varepsilon r_{i,t}$$
(4)

Where c_0 is the constant, c_1 and c_2 are regression coefficients, and $r_{m,t}$ is market return proxied by Kuala Lumpur Composite Index (KLCI), $r_{j,t}$ is sector return proxied by its sector index and $\varepsilon r_{i,t}$ is the residual return of firm i. The market return is defined as return on a market capitalisation-weighted portfolio comprised of 100 largest market capitalisation stocks traded on the Bursa Malaysia. The sector return is return on a market capitalisation -weighted portfolio based on all the stocks listed on each of the main sectors traded on the Bursa Malaysia.

The firm-specific volume is obtained by regressing firm's volume on day t ($v_{i,t}$) on market volume and on its sector volume on day t, $v_{m,t}$ and $v_{j,t}$, respectively, as follows:

$$v_{i,t} = c_0 + c_1 v_{m,t} + c_2 v_{j,t} + \varepsilon v_{i,t}$$

$$(5)$$

Where c_0 is the constant, c_1 and c_2 are regression coefficients, and $r_{m,t}$ is market trading volume proxied by the 100 index-linked companies' trading volume, $r_{j,t}$ is sector volume proxied by its sector trading volume and $\varepsilon r_{i,t}$ is the residual volume of firm i. To maintain compatibility, market and sector turnover series are also defined as detrended logarithm turnover as turnover series of each individual stock.

In addition to the full sample, the importance of information asymmetry on Bursa Malaysia is also being tested for two non-overlapping sub-sample periods. This sample period is chosen with three reasons: (i) matching the availability data of stock price, trading volume and market capitalisation; (ii) the two sub-sample periods provide alternative length of study period; (iii) the two sub-sample periods able to reflect the political and economic developments of Malaysia.

The Asian Financial crisis occurred during first sub-sample period. The crisis began in mid-1997 arising from a speculative attack on the East Asian currencies, including the Malaysian Ringgit. Malaysian stock market lost 80% of its market valuation. From a high of RM917 billion in February 1997 the market valuation sank to RM 182 billion in September 1998 when the selective capital controls were imposed. This drop was reflected in the movement of the KLCI, which fell from 1271 points to 262 points in February 1997 to the lowest point of 262.7 by 9th September 1998 (Economic management and outlook, 2002/2003).

The second sub-sample period is the post-control period of financial crisis. Malaysian economy experienced sluggish growth in 2001, but rebounded strongly in 2002. The KLCI was trading in the range of 750-770 in June 2002, with many investors bullish on the likelihood of further advances. The index had risen approximately 300 percent from its record of lowest point of 262.7 in September 1998 during the depths of the recession (Economic outlook, 2003) The Government introduced the Package of New Strategies to stimulate the nation's economic growth in May 2003. The four strategies of the Package were aimed at promoting private sector investment, strengthening the nation's competitiveness, developing new sources of growth and enhancing the effectiveness of the delivery system (Management and outlook, 2003). Consequently, the two sub-sample periods for this study are defined as follows:

Crisis period – 1st July 1997 to 30th June 2000
Post-crisis period – 1st July 2000 – 30th June 2005

Speculation on asymmetric information is the primary motive to trade on the Malaysian stock market (Chue and Lai, 2007). Two steps are involved in this study; (i) to further investigate whether market-wide or firm-specific information asymmetry is the driving force behind the relation of trading volume and return (ii) to test cross-sectional variation individual stocks in the dynamic volume-return interaction.

Residual return and residual volume from the respective market models (equation 4 and 5) are used in a basic equilibrium model to find out if the firm-specific private information as the main factor that produces the cross-sectional variation in relation of trading volume and return as follows:

$$\varepsilon r_{i,t+1} = c_1 \varepsilon r_{i,t} + c_2 \varepsilon v_{i,t} \varepsilon r_{i,t} + error_{i,t+1} \tag{6}$$

Where $\varepsilon r_{i,t}$ is the residual return of stock i on day t, and εv_{it} is the daily residual volume of stock i on day t. c_1 is coefficient of stock's residual return autocorrelation and c_2 is the coefficient of influence of residual volume on the residual return autocorrelation. c_2 shows the relative importance of firm-specific speculative and hedging trading for a stock. If hedging is relatively more important than speculation, c_2 will be negative and statistically significant from zero. Conversely, it will be positive and statistically significant if the stock is strongly associated with informational trading. If neither firm-specific hedging nor speculative trading dominates overall trading activity in the stock, the c_2 will be close to zero and statistically insignificant.

After obtaining c_2, second stage of examining cross-sectional differences in the resulting c_2 coefficients of the volume-return interaction terms is continued with the following cross-sectional regression:

$$c_{2i} = a + b \, ORD(A)_i + ERROR_i \tag{7}$$

Where c_{2i} is as defined above and $ORD(A)_i$ is the ordinal transformation of information asymmetry proxy A_i of stock i. $b < 0$ when the information proxy is market capitalisation. According to Lo and McKinlay (1990), larger firms have less information asymmetry problems.

4.0   ANALYSIS AND DISCUSSION

4.1   Time-series Analysis

Panel A of Table 1 shows that out of the entire sample, 98.9% of the basic equilibrium models of firms are statistically different from zero at confidence level of 10%. Only approximately 2.9% of the stocks with significant c_2 have negative c_2. This provides evidence that a large number with 231 individual firms on the Malaysian stock market exhibit price continuation following days with high volume. This finding indicates that speculation on firm-specific private information is the primary motive to trade on Malaysian stock market. This firm-related information includes earnings report that contains news about a firm's performance in the most recent time, news about the new business model that the firm has adopted and news on production costs and demand shock of a firm.

The result also shows that c_2 increases as the size of the firm increases. Most of the investors tend to speculate large market capitalisation-based firms rather than medium and

small firms. In large market- capitalisation group, approximately 98% of the firms have a more positive c_2 with a mean value of 0.1255 as compared to 0.0926 and 0.0721 for medium and small market- capitalisation groups, respectively. This is probably due to the reason that most of the large firms are index-linked company. Hence, investors tend to speculate firm-specific information of these index-linked companies or the blue-chip stocks to gain superior profits especially during a recovery and expansion periods, for instances, Genting Berhad, Maxis Communication Berhad, Tenaga National Berhad, Proton Holdings Berhad and so forth (The Star, 2006). Table 2 panel A shows the further investigation on the motivation to trading of investors on two sub-sample periods, namely crisis period and post control period. More then 96% of the large firms continue to exhibit highly significant positive c_2. This indicates that the results are not sensitive to the length of sample period, neither three-year period of crisis nor five-year period of post crisis. This is likely due to the nature of informational inefficiency of an emerging country.

4.2   Cross-sectional Analysis

Panel B of Table 1 indicates a highly significant positive (b = 0.07813) relation between market capitalisation and the firm-specific volume-return interaction parameter (c_2). This positive sign persist in the crisis and post periods in panel B of Table 2, regardless the length of study period. It shows that larger firms tend to exhibit more speculative trading following days with high trading volume on Malaysian stock market as compared to medium and small firms. Hence, this is particularly important to improve the market liquidity which eventually will develop the Malaysian stock market into an efficient and well functioning market which allocates capitals effectively.

5.0   CONCLUSIONS

This paper uses linear regression to examine if trading in Malaysian stock market is firm-specific speculation-motivated or for hedging purpose. Through analysing daily data in both the full and sub-sample periods, this study provides evidence that most of the investors in Malaysian stock market tend to speculate firm-related private information to maximize their profits. This is more significant for larger firms that could be related to the index-linked companies in Malaysian stock market. This finding provides important implications to policy makers in addition to investors in this developing market. Proper management of foreign portfolio investment is crucial to prevent manipulative moves and excessive speculative forms of portfolio investments that may cause excessive surges of inflows and massive panic outflows of short-term capital and thus collapse the financial system and downturn economy. Hence, some policies, for instance, transactions tax policy or corporate governance, need to be implemented to reduce this speculative practice that pose a threat to the national economy.

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Table 1: Market capitalisation and tests of influence of residual volume on the autocorrelation of residual returns on full sample period (1st July 1997 – 30th June 2005)

Panel A: Time series analysis

$$\varepsilon r_{i,t+1} = c_1 \varepsilon r_{i,t} + c_2 \varepsilon v_{i,t} \varepsilon r_{i,t} + error_{i,t+1}$$

Category	Average F-statistic	Average tc_1	Average tc_2	Average c_1	Average c_2	Average R^2 (%)	AvgCap (m)
	l#l > 2.30***	l#l > 1.658**/ 1.645*	#l > 1.658**/ 1.645*	# < 0	# < 0		
Entire	0.0583	-9.6201	4.6793	-0.2290	0.0955	5.82	1121.71
(n=272)	269	265	238	267	7		
Low	0.0657	-10.4427	4.2621	-0.2526	0.0721	6.35	110.21
(n=90)	90	89	80	90	3		
Medium	0.0632	-10.3493	4.7594	-0.2448	0.0926	6.28	317.86
(n=91)	91	90	81	91	2		
Large	0.0457	-8.0056	5.0893	-0.1880	0.1255	4.57	2937.06
(n=91)	88	86	77	86	2		

Notes:

$R_{i,t}$ is return of stock i on day t, $V_{i,t}$ is detrended log turnover of stock i on day t, n is sample size, AvgCap is average capitalisation

*** Critical value for F distribution with 2 and ∞ degree of freedom (d.f.) is 2.30 at 10% level of significance

* * Critical value for t with 120 observations is 1.658 at 10% level of significance

* Critical value for t with ∞ observations is 1.645 at 10% level of significance

Panel B: Cross-sectional analysis

$c_{2i} = a + b \ ORD(CAP)_i + ERROR_i$

Dependent variable	a	b	R^2 (%)	F (%)	Observations
c_2	0.0574	0.07813	16.53	0.0000	238
t =	(8.6664)	(6.8356)			
p value =	(0.0000)	(0.0000)			

Notes:

$ORD(CAP)_i$ is a variable representing the ordinal scale of market capitalisation of stock i.

Table 2: Market capitalisation and tests of influence of residual volume on the autocorrelation of residual returns on sub-sample periods

Crisis Period (1st July 1997 – 30th June 2000)

Panel A: Time series analysis

$$\varepsilon r_{i,t+1} = c_1 \varepsilon r_{i,t} + c_2 \varepsilon v_{i,t} \varepsilon r_{i,t} + error_{i,t+1}$$

Category	Average F-statistic	Average tc_1	Average tc_2	Average c_1	Average c_2	Average R^2 (%)	AvgCap (m)
	l#l > 2.30***	l#l > 1.658*/ 1.645**	l#l > 1.658*/ 1.645**	# < 0	# < 0		
Entire	0.0010	-5.8447	3.2869	-0.2211	0.1152	5.73	428.36
(n=272)	269	263	204	272	8		
Low	0.0005	-6.0896	3.2299	-0.2336	0.0998	6.04	42.09
(n=90)	89	89	60	90	3		
Medium	0.0000	-6.3798	3.5563	-0.2360	0.1169	6.42	121.39
(n=91)	91	91	68	91	2		
Large	0.0026	-5.0250	3.0908	-0.1923	0.1259	4.72	1121.61
(n=91)	89	83	76	91	3		

Notes:

$R_{i,t}$ is return of stock i on day t, $V_{i,t}$ is detrended log turnover of stock i on day t, n is sample size, AvgCap is average capitalisation

*** Critical value for F distribution with 2 and ∞ degree of freedom (d.f.) is 2.30 at 10% level of significance

* * Critical value for t with 120 observations is 1.658 at 10% level of significance

* Critical value for t with ∞ observations is 1.645 at 10% level of significance

Panel B: Cross-sectional analysis

$c_{2i} = a + b \, ORD(CAP)_i + ERROR_i$

Dependent variable	a	b	R^2 (%)	F (%)	Observations
c_2	0.0940	0.0187	2.86	1.5657	204
t =	8.6996	2.4374			
p value =	0.0000	0.0157			

Notes:

$ORD(CAP)_i$ is a variable representing the ordinal scale of market capitalisation of stock i.

Table 2: Market capitalisation and tests of influence of residual volume on the autocorrelation of residual returns on sub-sample periods (continued)

Post Control Period (1st July 2000 – 30th June 2005)

Panel A: Time series analysis

$$\varepsilon r_{i,t+1} = c_1 \varepsilon r_{i,t} + c_2 \varepsilon v_{i,t} \varepsilon r_{i,t} + error_{i,t+1}$$

Category	Average F-statistic	Average tc_1	Average tc_2	Average c_1	Average c_2	Average R^2 (%)	AvgCap (m)
	l#l > 2.30***	l#l > 1.658*/ 1.645**	l#l > 1.658*/ 1.645**	# < 0	# < 0		
Entire	0.0006	-7.7855	4.0354	-0.2385	0.1058	0.0659	693.35
(n=272)	270	267	211	269	5		
Low	0.0002	-8.4579	3.9156	-0.2648	0.0829	7.94	68.12
(n=90)	89	89	69	88	2		
Medium	0.0000	-8.2440	3.9823	-0.2534	0.1031	7.11	196.48
(n=91)	90	89	70	90	3		
Large	0.0014	-6.6546	4.2018	-0.1974	0.1304	4.75	1815.45
(n=91)	91	89	72	91	0		

Notes:

$R_{i,t}$ is return of stock i on day t, $V_{i,t}$ is detrended log turnover of stock i on day t, n is sample size, AvgCap is average capitalisation
*** Critical value for F distribution with 2 and ∞ degree of freedom (d.f.) is 2.30 at 10% level of significance
* * Critical value for t with 120 observations is 1.658 at 10% level of significance
* Critical value for t with ∞ observations is 1.645 at 10% level of significance

Panel B: Cross-sectional analysis
$c_{2i} = a + b\ ORD(CAP)_i + ERROR_i$

Dependent variable	a	b	R^2 (%)	F (%)	Observations
c_2 =	0.0737	0.0140	9.11	0.0000	211
t =	(9.1094)	4.5773			
p value =	(0.0000)	(0.0000)			

Notes:

$ORD(CAP)_i$ is a variable representing the ordinal scale of market capitalisation of stock i.