

## The Lead-lag Relationships of Equity Fund Flows: Evidence of an Emerging Market

(Hubungan Pimpin-Lengah Aliran Dana Ekuiti: Bukti Pasaran Membangun)

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### ABSTRACT

*This study examines the lead-lag relationships among four arrays of equity fund flows into Malaysian equity market. The equity fund flows are of (1) local institutional and retail investors and (2) foreign institutional and retail investors. Using a daily aggregate data, the findings of this study reveal that foreign institutional equity fund flows have an impact on both local institutional and retail equities' fund flows. However, local institutional equity fund flows do not have relationships with either foreign institutional or retail equity fund flows. This research also shows that there is a bi-directional causality between local retail and foreign institutional equities' fund flows. However, there is a uni-directional causality running from local retail to foreign retail equity fund flows. The finding also discloses that there is no lead-lag relationship between foreign institutional and retail equities' fund flows. Even though both local institutional and retail equities' fund flows influence each other, the impact of local institutional on local retail equity fund flows is stronger. Fund flows own innovations explain more on the variability in both foreign institutional and retail equities' fund flows, as well as local retail equity fund flows. However, innovations in other types of equity fund flows on aggregate basis explain more on the variability in local institutional equity fund flows as opposed to its own innovations. Finally, among the four categories of equity traders, foreign institutions and local retailers seem to drive Malaysian equity market.*

*Keywords: Lead-lag relationships; equity fund flows; institutional investors; retail investors; emerging market; granger causality; variance decomposition*

### ABSTRAK

*Kajian ini meneliti hubungan pimpin-lengah di kalangan empat kategori aliran dana ekuiti ke dalam pasaran ekuiti Malaysia. Aliran dana ekuiti adalah bagi kategori pelabur berikut iaitu (1) pelabur institusi dan runcit tempatan dan (2) pelabur institusi dan runcit asing. Penemuan kajian berdasarkan data agregat harian menunjukkan bahawa aliran dana ekuiti institusi asing mempunyai kesan terhadap aliran dana ekuiti institusi dan runcit tempatan. Walau bagaimanapun, aliran dana ekuiti institusi tempatan tidak mempunyai hubungan dengan aliran dana ekuiti institusi atau runcit asing. Kajian ini juga menunjukkan bahawa wujud hubungan dua hala antara aliran dana ekuiti runcit tempatan dan institusi asing. Walau bagaimanapun, wujud hubungan satu hala antara aliran dana ekuiti runcit tempatan dan asing. Penemuan kajian juga menunjukkan bahawa tiada hubungan pimpin-lengah antara aliran dana ekuiti institusi dan runcit asing. Walaupun aliran dana ekuiti institusi dan runcit tempatan mempengaruhi antara satu sama lain, tetapi kesan aliran dana ekuiti institusi ke atas aliran dana ekuiti runcit tempatan adalah lebih kukuh. Pada dasarnya, inovasi sendiri menjelaskan lebih banyak mengenai kebolehubahan (variabiliti) dalam aliran dana ekuiti institusi dan runcit asing, serta aliran dana ekuiti runcit tempatan. Walau bagaimanapun, inovasi dalam aliran dana ekuiti asing serta aliran dana ekuiti runcit domestik secara agregat mempunyai impak yang signifikan terhadap kebolehubahan dalam aliran dana ekuiti institusi tempatan berbanding dengan inovasi sendiri. Akhirnya, di kalangan empat kategori pedagang ekuiti tersebut, pelabur institusi asing dan pelabur runcit tempatan merupakan penggerak utama kepada pasaran ekuiti Malaysia.*

*Kata kunci: Hubungan pimpin-lengah; aliran dana ekuiti; pelabur institusi; pelabur runcit; pasaran baru muncul; kesan granger; penguraian varians*

### INTRODUCTION

Recent academic literature has witnessed an upsurge of research activities studying the trading behaviour of equity investors both in local and foreign financial markets. One of the research areas explored is the interactions between equity returns and equity fund flows of both local and foreign financial equity markets. Two main research areas have been explored on the linkages between stock returns and investor trading behaviour. First, is whether return of the market affects the trading behaviour of institutional

and retail investors, both local and foreign. Specifically, the study focuses on the investors trading strategy, i.e. either they employ a momentum or a contrarian trading strategy in responding to changes in the stock market performance.

Second, is on the information dissemination concept; which is a study on the causal relation running from equity fund flows to equity return (Lin & Swanson 2008; Bekaert, Harvey & Lumsdaine 2002). The focus of the study is whether the investors trading behaviour influences the movement of the stock market return both in short and

long-term-periods. The fund flows of equity will have a temporary impact on equity return if it incorporates 'noise' instead of stock fundamental values. The equity prices will temporarily depart from their equilibrium prices; hence, creating a demand surplus. The study on short term and long-term effects of equity fund flows on equity returns relates to the price momentum (pressure) and information revelation, respectively. A positive price momentum takes place if equity prices continuously escalating subsequent to buy trades or keep falling following to sale trades. A negative price momentum will transpire if the reverse scenarios occur. Past literature had established that fund flows of equity do have an impact on the return of domestic equity market (Chandra 2012; Dahlquist & Robertsson 2004; French & Li 2012; Froot & Ramadorai 2008; Froot, Connell & Seasholes 2001; Ülkü & İvizlerli 2012).

Past studies provided different evidences in the trading patterns of each class of investors especially with regard to institutional and retail equity investors (Barber & Odean 2008; Bae, Yamada & Ito 2008; Chiang et al. 2012). Even though much research on the behavioural trading pattern of equity investors in financial markets had been carried out, one area of research that is still scarce and needs to be explored further is the lead-lag relationships of equity fund flows. Specifically, the main objective of this paper is to examine the lead-lag relationships of investors' equity fund flows in an emerging equity market like Malaysian equity market. This paper would like to provide answers to the following two research questions. First, do equity fund flows of foreign investors (institutions and retail) lead equity fund flows of local investors (institutions and retail), i.e. in relation to the performance of domestic equity market, or vice versa? Second, which equity trader is the leading player in the trading activities of Malaysian equity market?

The remainder of this paper continues as follows. Section 2 reviews prior literature on the current research topic. Section 3 describes the data and methodology employed by this study. Section 4 discusses the findings; and lastly Section 5 summarizes and concludes this study.

#### LITERATURE REVIEW

Research on the behavioural patterns of equity investors with regard to the performance of the stock market is well documented especially in developed market. Basically, there are several types of equity investors and the most prominent groups are (1) local institutional and retail investors, and (2) foreign institutional and retail investors. Institutional investors are always viewed as better-informed investors. They buy shares for long-term investment purposes and use stock fundamental values when making investment decisions. In contrast, the stock market views retail investors as less-informed investors. They are involved in short term, speculative and profit taking investment activities and exposed to the

psychological biases in their investment decision-making processes (Kaniel, Saar & Titman 2008).

Prior studies revealed that there is a distinctive trading behaviour in investment strategy between institutional and retail equity investors such as Sias and Starks (1997), Wermers (1999), Grinblatt and Keloharju (2000), Edelen and Warner (2001), Cai and Zheng (2004), Griffin, Nardari and Stulz (2007), Ng and Wu (2007), Lee, Li and Wang (2010), Hong and Lee (2011) and Ahmed (2014). The finance literature also observes mixed results in the trading strategies of investment activities within the same class of investors. For instance, studies of Sias and Starks (1997), Cai and Zheng (2004); and Hong and Lee (2011) revealed that institutional investors follow positive feedback trading strategies. On the contrary, Lee, Lin and Liu (1999) study revealed that institutional investors pursue neither positive nor negative feedback trading strategies. Meanwhile, Grinblatt and Keloharju (2000), Griffin et al. (2007) and Lee et al. (2010) studies revealed that in comparison to institutional investors, retail investors demonstrate strong return-volume relations.

While the bulk of literature on the area of behavioural finance of equity investors in financial markets focuses on the differences in trading patterns of various investors in relation-to the performance of equity returns (Barber & Odean 2008; Bae et al. 2008; Chiang et al. 2012), there are also other interesting and equally important research scopes. Among others are studies like investment performance of equity traders (Ahmed 2014, Phansatan et al. 2012), capital flows, interest rates, returns and dividend yields relationships (Bekaert et al. 2002), and bear market behaviour of institutional investors (Burnie & Ridder 2009). Other studies include market return and mutual fund flow (Edelen & Warner 2001), foreign equity flows and the "size bias" (Diyarbakirlioglu 2011), interactions among equity returns, flows and dividends (French & Naka 2013), volatility and foreign equity flows (Wang 2007; French & Wishwakarma 2013), herding and stock returns (Goodfellow, Bohl & Gebka 2009; Jeon & Moffett 2010; Phansatan et al. 2012; Hsieh 2013). Prior studies also focused on other related issues such as equity prices, foreign exchange rates and investment flows (Hau & Rey 2006), price volatility and institutional trades in a retail investor dominated emerging market (Li & Wang 2010), determinants of capital flows to developing countries (Vita & Kyaw 2008) and equity traders trading behaviour in foreign markets (Bekaert et al. 2002; Bohn & Tesar 1996; Brennan & Cao 1997; Lin & Swanson 2008).

Even though abundant studies related to trades of equity investors have been documented in the finance literature, one area of research that receives less attention from the researchers is the lead-lag relationships and interdependencies amongst the equity fund flows for arrays of investors. Review of literature finds that only three studies had carried out similar studies, for instance Lee et al. (1999) on Taiwan equity market, Boyer and Zheng (2009) on U.S. equity market, and Hong and Lee (2011) on Korean equity market; and hence, this motivates

us to carry out this study. One class of investor may do the trading ahead of the other classes of investors. For instance, foreign equity investors may trade ahead of the domestic equity investors in relation to the movement of the local stock market. This is based on the argument that foreign investors are better traders because they are presumed to have the advantages in terms of information at the global equity market level and the speed to act on the information invariably affecting fund flows of certain equity markets. Grinblatt and Keloharju (2000) and Seasholes (2000) supported this conjecture whereby they stated that the availability of and capability to act on information flow propel foreign investors to be the lead driver based on the foundation of information advantage. Froot and Ramadorai (2008) also had the same line of reasoning. On the contrary, Brennan and Cao (1997) had a different argument on the same subject matter. They contended that local investors have information advantage over foreign investors. Dvorak (2005) also agreed with the latter's argument; thus, foreign investors may follow the behaviour of local traders.

Similarly, institutional investors may influence the trading activities of the retail investors. There is an argument that institutional investors as well as professional fund managers normally hold significant quantity of equities. Hence, they have the capacity to have an effect on the returns and trading volume of the shares that they hold. Furthermore, since they manage significant value of financial assets, these professional investors contribute to the larger percentage of daily trading volume. Not only that, they also have the access to a broad pool of resources that helped them to gather important information and develop expertise. With the availability of valuable information and experts, the key institutional investors have the ability to shift the stock prices both direct and indirect, through their own trading activities and influence other traders' trading decisions, who may observe their behaviour respectively (Foster, Gallagher & Looi 2011). Kaniel et al. (2008) also had the same view on the trading advantage and trading behaviour of the institutional investors over the retail investors. They pointed out that the market perceives institutional investors as better-informed, prudent or rational traders with long-term equity investment outlook. On the contrary, the market views retail investors as unsophisticated traders. They prefer to trade for short term investment purposes. They are perceived as to be acting on sentiment-based biases that are emotionally influenced by their personal cognitive reasoning, feelings or investment mood.

This study provides contributions to the literature of behavioural finance, particularly on investor's equity fund flows, based on the following arguments. As mentioned earlier, there are very few studies on the issues of lead-lag trading of equity traders. One of them is Lee et al.'s (1999) study, which investigated the interrelation and impact between institutional investors, big and small individual investors. The findings of their study revealed that big individual investors substantially affect small individual

investors trading behaviour. However, this is inversely not the case where small individual investors do not have an impact on institutional and big individual investors. Institutional investors and big individual investors appear to act independently and; in general, not affected by past trading actions by other groups of investors. However, there is limitation to their findings, which were based on an analysed 3-month trading data for a period from March to May 1995; which arguably may not cover other forms of investors' trading patterns. The short-term intraday data analysis used to observe long-term interrelation and impact among the three groups of investors provide a full picture of the trading interrelation and relationship(s) if any may not accurately be determined. In addition, the focus of their analysis is only on the 30 most actively traded firms.

Meanwhile, the findings of a study by Boyer and Zheng (2009) showed that there are several cross effects based on different flows of investor types. However, they did not discuss the details on the finding; thus, it is not known which class of investors lead the stock market. In addition, the data of their study were on quarterly basis; which is considered as low frequency data. In a more recent study, Hong and Lee (2011) demonstrated that net investment flows (NIF) by government Granger-cause NIF by foreign investors. However, neither institutional nor individual investors' NIF had an impact on foreign investor NIF. These findings indicated that foreign investors do not respond to domestic investors' trades. In addition, individual investors take very short-term negative feedback (i.e., contrarian) trades in response to NIF by foreign investors. Regarding the NIF by institutional investors, the findings showed that both the NIF by individual investors and government influenced the NIF by institutional investors. In their study, Hong and Lee employed Korea Exchange's (KRX) daily investment data flows (both buy trade and sell trade) of four different types of investors.

This study carries out a research similar to the studies by Lee et al. (1999), Boyer and Zheng (2009) and Hong and Lee (2011). The focus of interest of the present study is to address and examine the trading patterns of equity fund flows (i.e. lead-lag relationships) of individual and institutional investor categories, both local and foreign, transacting in equity securities listed on Bursa Malaysia on aggregate basis. Past empirical findings on the trading behaviour of equity fund flows provide diverse results and explanation for different financial market settings (Ahmed 2014). The availability of high frequency aggregate trading data (i.e. daily data) for a period from September 2009 to February 2015 of Bursa Malaysia enabled this study to carry out a detailed research on the lead-lag relationships of equity fund flows for four categories of investors, namely retail and institutional investors, both local and foreign. The focus groups of this study are different from that of Lee et al. (1999) which emphasis on the interdependencies of trading patterns between institutional investors, big and small individual investors; and not on foreign retail and institutional

investors. Past studies on the trading behaviour of equity investors with the exception of Ahmed (2014) basically focused on one category of foreign investors that is the institutional investors (Chandra 2012; French & Ahmad 2011; French & Li 2012; French & Naka 2013) or foreign investors as a total (Boyer & Zheng 2009; Chiang et al. 2012; Diyarbakirlioglu 2011; French 2011; French & Vishwakarma 2013).

In addition, there are differences in terms of the usage of data in the current study. This study employs a lengthier daily time series data as opposed to Lee et al.'s (1999) study, which focused on a three-month intraday transaction data in 1995. Meanwhile, Boyer and Zheng (2009) used the quarterly time series data, considered as low frequency data. Contrary to lower frequency data, higher frequency data are more reliable in studying the inter-relationship or interdependencies and the dynamics of cross drivers between types of equity flows in detecting the lead-lag phenomenon among types of investors. Hong and Lee (2011) focused on the interdependencies of equity fund flows (i.e. net fund flows) of Korean equity market. Furthermore, the equity flows data of this study are both in terms of trades' quantity and value, which are different from Lee et al. (1999) that focused on net buy order in round lots. Boyer and Zheng (2009) focused only on cash flow transactions; and Hong and Lee (2011) focused on value of trades. However, for the purpose of discussion, this study only reports the results according to value of trades and the findings based on quantity of trades are available upon request. In addition, this study focuses on lead lag relationships at aggregate level and it differs from the study of Lee et al. (1999) which focuses on fund flows of equity of individual firm.

Thus, to enrich the literature on behavioural finance, particularly on the lead-lag relationships of equity fund flows from a broad array of investor groups, it is vital to carry out this research. Various parties including individual and institutional investors, both local and foreign, fund managers as well as policy makers will not only benefit but also see a complete picture of how investors actually behave and how they differ from one another in the way they react to the same information. Understanding the behaviour of equity fund flows enables stock market participants such as local retail, local institutional, foreign retail and foreign institutional investors as well as professional fund managers to devise appropriate investment strategies of either to enter or exit the stock market in order to maximise return. This is vital as different investor groups may behave differently which show diverse strategies; and they may even adopt contrarian trading strategies to be ahead of the investment curve. For instance, small individual investors are generally "losers"; thus, it is advisable for them to delegate their equity investment to institutional investors, such as mutual fund managers (Lee et al. 1999). Furthermore, liquidity had been identified as an important factor in the smooth functioning of financial markets. It helps market participants to fulfil supply and demand's voids or gaps that strengthen the equity market

tolerance against the vagaries of unexpected volatility in fund flows patterns. Liquidity also plays an important role as the determinant or price discovery of an asset resulting in it gaining substantial attention from researchers all over the world (Syamala, Chauhan & Wadhwa 2014). Thus, by understanding the lead-lag trading behaviours of equity investors, i.e. institutional and retail of both local and foreign, Malaysian policymakers would be able to formulate policies and parameters that encourage a systematic, vibrant and safe Malaysian equity market.

## DATA AND METHODOLOGY

### SAMPLE DESCRIPTION

This study utilises an aggregate daily data of net equity fund flows based on value of trades made separately by retail and institutional investors, both local and foreign. The value of trades is in Ringgit Malaysia (MYR). In addition, the current study also employs stock market return, and its calculation is based on the closing values of FBMEMAS Index, which is a capitalization-weighted index. The index is comprised of the large and mid-cap constituents of the FTSE Bursa Malaysia 100 Index and the FTSE Bursa Malaysia Small Cap Index. All of the data employed by this study were obtained from Bursa Malaysia, which is the official stock exchange of Malaysia. Due to the limitation of the availability of equity fund flows data, this study's period starts from October 2009 until February 2015. In total, the number of observations for each time series data is 1521.

This study employs Equation (1) to calculate the net equity fund flows and it is consistent with Hong and Lee (2011), Phansatan et al. (2012) and Ahmed (2014).

$$NF_{J,t} = (BUY_{J,t} - SELL_{J,t}) / (BUY_{J,t} + SELL_{J,t}) \quad (1)$$

where  $NF_{J,t}$  is net equity fund flows on day  $t$  by group  $J$  (institutional and retail investors both local and foreign),  $BUY_{J,t}$  is cumulative buy trades on day  $t$  by investors  $J$  in the form of value of trades and  $SELL_{J,t}$  is cumulative sell trades on day  $t$  by investors  $J$  in the form of value of trades.

This study employs Equation (2) to calculate stock market return.

$$EMASR = (EMAS_t - EMAS_{t-1}) / EMAS_{t-1} \quad (2)$$

where EMASR is return of FTSE Bursa Malaysia EMAS Index (FBMEMAS),  $EMAS_t$  and  $EMAS_{t-1}$  are indexes' closing values on day  $t$  and  $t-1$ , respectively.

### METHOD OF ANALYSIS

This study employs vector autoregressive (VAR) model to explore the lead-lag relationships among the arrays

of net equity fund flows. This model treats all of the net equity flows as endogenous variables. French (2011) emphasises that the VAR model is useful for forecasting systems of interrelated time-series variables as well as testing causality among the endogenous variables. This is due to the distinctive feature of the model, which treats each variable in the system symmetrically. The model allows the variables to affect each other as well, as such permits feedbacks to be integrated in the analysis (Enders 2004). Vector autoregressive analysis estimates unrestricted reduced form equations that have uniform sets of the lagged dependent variables of every equation as regressors (Chowdhury, Howe & Lin 1993) as shown in Equation (3).

$$y_t = \alpha + \beta y_{t-1} + e_t \quad (3)$$

where  $y_t$  is a  $7 \times 1$  vector,  $\alpha$  is a  $7 \times 1$  parameter vector,  $\beta$  is a  $7 \times 7$  parameter matrix, and  $e_t$  is a  $7 \times 1$  vector of residuals. The seven random variables in  $y_t$  include total foreign and local equities' fund flows, and equity fund flows of the four groups of investor (local retail, local institutional, foreign retail and foreign institutional) as well as the market return (Boyer & Zheng 2009).

This study carries out the analysis in two stages to examine lead-lag relationships among net equity fund flows. First, the VAR model permits for the causality tests among all net equity fund flows used in this study by using VAR Granger Causality test. The principles of this test is that; if a variable (i.e X) affects variable Y, then this implies that changes in X will tend to precede or influence changes in Y. This is because if X causes Y, it is highly improbable that Y will occur before X, it is a causal variable. This method involves two equations of which each of the equations has the current value of either variable (Y or X) as dependent variable and the other variable (X or Y) acts as lagged value of the dependent variable as independent variable. For example, if lagged variables of say X, significantly has an impact on the current value of Y, then this implies that variable X Granger-causes variable Y and vice versa, ceteris paribus

(Chandra 2012). Second, this study proceeds with the method of VAR Variance Decomposition to test how much of the variability in the innovations in each variable is being accounted for by the variable itself and how much by the other variable.

This study deals with time series data of all arrays of net equity fund flows and market return. Basically, the main issue of time series data is non-stationarity, which can affect the reliability of the findings. This study utilises unit root test to determine the non-stationarity of the time series data (Dickey & Fuller 1979, 1981). The current study also employs Akaike information criterion (AIC) to determine the appropriate number of lags. These two tests are essential before this study can proceed with other testings i.e. VAR Granger Causality Test and VAR Variance Decomposition.

## RESULTS

### DESCRIPTIVE STATISTICS AND CORRELATION COEFFICIENTS

Table 1 presents the summary statistics for various classes of net equity fund flows and market return for the sample period from October 2009 to February 2015. The statistics report that in contrary to local investors, foreign investors are net buyers of equity with an average value of foreign trades of 0.02. The average values of net equity fund flows of foreign and local institutional investors are positive; thus, both classes of investors are net buyers of equity. Meanwhile, the average values of net equity fund flows of both foreign and local retail investors are negative, meaning that both classes of investors are net seller of equity.

Table 1 also reports that the volatility of net equity fund flows appears to be higher for foreign trades as compared to local trades. The statistics for the ADF test reveal that there is no unit root for each class of net equity fund flows and market return at 1 percent significance level; thus, all of the data series are stationary at level.

TABLE 1. Summary statistics of investors' net daily equity fund flows and return

	Mean	Std Dev	Max	Min	ADF
Total foreign equity fund flows	0.020	0.165	0.530	-0.527	-8.275**
Total local equity fund flows	-0.001	0.072	0.275	-0.248	-8.524**
Foreign institutional equity fund flows	0.021	0.169	0.549	-0.536	-8.301**
Local institutional equity fund flows	0.008	0.101	0.418	-0.332	-8.783**
Foreign retail equity fund flows	-0.059	0.183	0.550	-0.580	-19.225**
Local retail equity fund flows	-0.023	0.061	0.208	-0.496	-9.673**
Return	0.0003	0.005	0.036	-0.028	-17.250**

Note: Statistically significant at \*\*1 percent level

Table 2 reports the correlation matrix between VAR endogenous variables i.e. types of net equity fund flows. The statistics in Table 2 provide preliminary insights about the trading patterns for six (6) categories of equity fund flows. The results of this study show that total local and total foreign equities' fund flows are significantly and negatively correlated at 1 percent level. Both local

institutional and retail as well as foreign retail equity fund flows have negative correlations with foreign institutional trades and they are significant at 1 percent level. In addition, local retail equity fund flows correlate positively with both local institutional and foreign retail trades. The correlation coefficients are also significant at 1 percent level.

TABLE 2. Correlation coefficients

Panel A		Return	Total foreign	Total local		
Return		1.000				
Total foreign		.385**	1.000			
Total local		-.372**	-.963**		1.000	
Panel B		Return	Foreign institutional	Local institutional	Foreign retail	Local retail
Foreign institutional		.389**	1.000			
Local institutional		-.324**	-.914**	1.000		
Foreign retail		-.301**	-.269**	.158**	1.000	
Local retail		-.316**	-.416**	.163**	.348**	1.000

Note: (1) The symbol \*\* denotes the coefficients are significant at 1 percent level.

(2) Investors' equity fund flows are based on value of trade.

(3) Six categories of equity fund flows: total foreign and local equities' fund flows, foreign and local institutional equities' fund flows, and foreign and local retail fund flows.

The graph in Figure 1 further illustrates the differences in behavioural trading patterns among different arrays of equity investors, i.e. institutional and retail, both local and foreign with regard to the performance of local stock market. It is perplexing to note that in an emerging market such as Malaysian equity market, trades of local institutional investors are inversely correlating with trades of foreign institutional investors. This indicates capital replacement activity is in action to fill 'supply-demand void or gaps.' Arguably, it can be inferred that when there is a capital flight by foreign institutional investors, the local institutional investors take position or provide support to fill the demand void and take advantage of any undervalued investment position.

#### VAR GRANGER CAUSALITY

Table 3 summarises the regression results of VAR Granger Causality test, which reports the cause and effect relationships between two categories of net equity fund flows. The findings in Panel A of Table 3 report that there is unidirectional causality running from total foreign equity fund flows to total local equity fund flows. The causal relationship is significant at 5 percent level. This study however, does not find any statistically significant relationship running from total local equity fund flows to total foreign equity fund flows. These findings are consistent with a study by Hong and Lee (2011) based on Korean daily data, which revealed that foreign investors do not respond to domestic investors' net investment flows. The results in Panel B reveal that foreign institutional

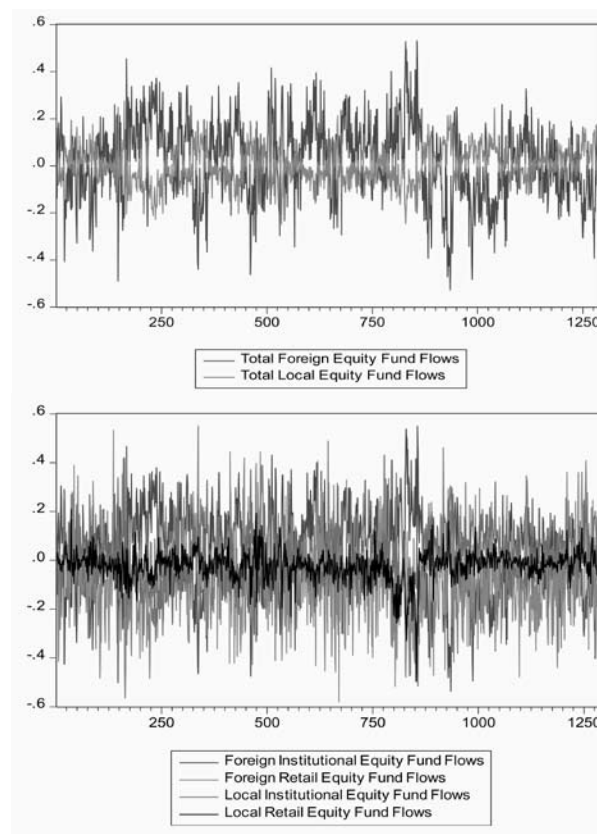


FIGURE 1. Net equity fund flows

equity fund flows lead local institutional equity fund flows. This study also does not find any statistically significant relationship running from local institutional equity fund flows to foreign institutional equity fund flows. The

results in C also reveal that there is a strong unidirectional causality running from local retail equity fund flows to foreign retail equity fund flows.

The findings in Panel D show that net equity fund flows of both foreign institutional and retail do not granger cause each other. Moreover, foreign retail equity fund flows also do not lead local institutional equity fund flows, and vice versa. The results in Panel E show there is bidirectional causality running from net equity fund flows of local institutional and retail investors, and vice versa. This finding however, contradicts the finding of Hong and Lee (2011) which showed a unidirectional causality running from the NIF by individual investors to the NIF by institutional investors. The finding of Lee et al. (1999) demonstrated that small individual investors

do not have an impact on institutional and big individual investors, and is inconsistent with the findings of this study. This study shows that net equity fund flows of local institutional investors have a stronger impact on net equity fund flows of local retail investors. This is as shown by the p-value of 0.007, which is significant at 1 percent level. A study by Lee et al. (1999) showed that trades by big and small individual investors were strongly correlated. This indicates that these categories of investors tend to buy or sell at the same time; hence, reflecting the existence of a herd behavioural phenomenon. However, no comparison can be made with the findings in the current study since it does not segregate the data into big and small individual investors.

TABLE 3. VAR Granger Causality test

Panel A: Total foreign vs total local equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	df	Prob.
Foreign equity fund flows				Local equity fund flows	Chi-sq	df	Prob.
Return	5.377	2	0.068	Return	3.702	2	0.157
Local equity fund flows	2.883	2	0.236	Foreign equity fund flows	6.305	2	0.042*
Panel B: Foreign institutional vs local institutional equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	df	Prob.
Foreign institutional				Local institutional			
Return	6.099	2	0.047	Return	0.733	2	0.693
Local institutional	2.122	2	0.346	Foreign institutional	11.003	2	0.004**
Panel C: Foreign retail vs local retail equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	Df	Prob.
Foreign retail				Local retail			
Return	46.942	2	0.000	Return	40.131	2	0.000
Local retail	26.266	2	0.000**	Foreign retail	1.378	2	0.501
Panel D: Foreign institutional vs foreign retail equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	Df	Prob.
Foreign institutional				Foreign retail			
Return	5.922	2	0.051	Return	44.206	2	0.000
Foreign retail	1.695	2	0.428	Foreign institutional	0.677	2	0.712
Panel E: Local institutional vs local retail equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	Df	Prob.
Local institutional	Chi-sq	Df	Prob.	Local retail			
Return	0.5366	2	0.764	Return	27.465	2	0.000
Local retail	7.357	2	0.025*	Local institutional	9.922	2	0.007**
Panel F: Foreign institutional vs local retail equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	Df	Prob.
Foreign institutional				Local retail			
Return	7.133	2	0.028	Return	28.972	2	0.000
Local retail	8.327	2	0.015*	Foreign institutional	6.3895	2	0.041*
Panel G: Foreign retail vs local institutional equity fund flows							
Dependent variable:	Chi-sq	Df	Prob.	Dependent variable:	Chi-sq	Df	Prob.
Foreign retail				Local institutional			
Return	47.957	2	0.000	Return	0.652	2	0.721
Local institutional	1.275	2	0.528	Foreign retail	5.145	2	0.076

Note: (1) Equity fund flows are in terms of value of trades.  
 (2) Symbol \*\* denotes the coefficients are significant at 1 percent level.  
 (3) Symbol \* denotes the coefficients are significant at 5 percent level.

The results of causal relationship between foreign institutional and local retail equities' fund flows also show similar results as those of local institutional and retail investors. However, findings by Hong and Lee (2011) revealed that foreign investors' NIF significantly Granger-cause individual investors' net investment flow, and not vice versa. The causal relationship running from net equity fund flows of local retail investors to net equity fund flows of foreign institutional investors is stronger, as shown by p-value figure of 0.015. The findings of this study also exhibit that local retail equity fund flows have more impact on foreign institutional equity fund flows than on local institutional equity fund flows.

#### VAR VARIANCE DECOMPOSITION

Table 4 presents the summary of results of VAR Variance Decomposition for a very short-term period (up to tenth day only). The discussion in this section is in accordance to the results at lagged length 2. The results of Variance

Decomposition of Table 4 consist of six sections. The first two panels, Panels A and B report the results involved foreign and local equities' fund flows on aggregate basis. The last four panels, Panels C, D, E and F report the results of foreign and local equities' fund flows of both institutional and retail.

The finding of this study reveals that in a very short run, innovation to total local net equity fund flows account for only a small percentage variation of fluctuation in total foreign net equity fund flows. The finding indicates that 70.58 percent of the variability in total foreign net equity fund flows is explained by its own innovation. Meanwhile, market return effect accounts 29.263 percent of the variance in total foreign net equity fund flows. In contrast, in reference to Panel B, the finding shows that more than 50 percent of the innovations in total foreign net equity fund flows are attributable to the variance of innovations in total local net equity fund flows. This finding reflects that variation in total foreign net equity fund flows plays a dominant role for variation in total local net equity fund flows, and not vice versa.

TABLE 4. Variance decomposition

Panel A: Variance Decomposition of foreign equity fund flows						
Period	S.E.	Return	Foreign	Local		
1	0.125	27.006	72.993	0.000		
2	0.140	29.263	70.580	0.155		
9	0.165	28.695	70.949	0.354		
10	0.165	28.689	70.951	0.358		
Panel B: Variance Decomposition of local equity fund flows						
Period	S.E.	Return	Foreign	Local		
1	0.056	25.993	57.451	16.555		
2	0.062	27.196	57.569	15.234		
9	0.072	26.363	60.856	12.779		
10	0.072	26.363	60.886	12.749		
Panel C: Variance Decomposition of foreign institutional equity fund flows						
Period	S.E.	Return	Foreign	Foreign retail	Local	Local retail
1	0.128	27.190	72.809	0.000	0.000	0.000
2	0.143	29.387	70.348	0.051	0.173	0.038
9	0.169	28.631	69.186	0.123	0.138	1.920
10	0.169	28.604	69.126	0.126	0.138	2.004
Panel D: Variance Decomposition of foreign retail equity fund flows						
Period	S.E.	Return	Foreign institutional	Foreign retail	Local institutional	Local retail
1	0.169	9.880	0.404	89.714	0.000	0.000
2	0.178	15.702	0.386	83.519	0.002	0.388
9	0.184	16.877	0.385	79.180	1.265	2.290
10	0.184	16.873	0.388	79.154	1.269	2.315
Panel E: Variance Decomposition of local institutional equity fund flows						
Period	S.E.	Return	Foreign institutional	Foreign retail	Local institutional	Local retail
1	0.080	19.258	54.845	0.291	25.604	0.000
2	0.088	19.494	55.872	0.250	24.355	0.026
9	0.101	20.330	58.521	0.288	20.515	0.344
10	0.101	20.343	58.527	0.289	20.456	0.383
Panel F: Variance Decomposition of local retail equity fund flows						
Period	S.E.	Return	Foreign institutional	Foreign retail	Local institutional	Local retail
1	0.046	10.493	3.960	2.876	18.999	63.668
2	0.053	14.955	4.945	2.768	16.406	60.923
9	0.061	12.796	6.708	2.385	14.983	63.126
10	0.061	12.788	6.765	2.381	14.952	63.111



Referring to Panel C, the analysis demonstrates that equity fund flows of foreign retail, local institutional and local retail have minimal association with foreign institutional equity fund flows. Roughly 70 percent of the variance of innovations in foreign institutional equity fund flows can be due to its own innovation (own shock). Similar to foreign institutional equity fund flows, foreign retail equity fund flows' variations are mainly caused by its own fluctuations (83.519%). Market return does, however, has a substantial influence over foreign institutional equity fund flows (29.387%) as compared to foreign retail equity fund flows (15.702%). In reference to Panel E, foreign institutional equity fund flows account more than half of the variation in local institutional equity fund flows (55.872%); followed by own innovations (24.355%) and market return (19.494%). About less than 1 percent is due to innovations in foreign retail equity fund flows. Meanwhile, local retail equity fund flows innovations have almost no impact on local institutional equity fund flows.

The figures of Panel F suggest that about 61 percent of the variability in local retail equity fund flows is due to its own innovations. Local institutional equity fund flows and market return do have a material impact over local retail fund flows, whilst less than 5 percent is due to innovations in both foreign institutional and retail equity fund flows. Furthermore, the results reveal that past innovation in market return has a decreasing effect on both foreign and local equity fund flows, except local institutional equity fund flows, as the number of lag length increases. In contrast, equity fund flows own innovation has an increasing effect in explaining the variability for all categories of equity fund flows as the number of gaps between past trading and current trading days reduces. This study however, is unable to make a direct comparison with the findings of other studies due to different methods and variables used. The closest study is by Lee et al. (1999) who investigated the inter-relations of trading activities among institutional, big individual and small individual investors on the Taiwan Stock Exchange. The findings of their study based on innovation accounting analysis revealed that big individual investors have sizeable impact on small individual investors' trading behaviour, but not vice versa.

#### SUMMARY AND CONCLUSION

This study examines the lead-lag relationships among four arrays of equity fund flows, institutional and retail, both local and foreign. Using an aggregate data, this study provides new findings on the lead-lag relationships among equity fund flows of four main groups of investors into Malaysian equity market. The findings of this study revealed that foreign equity fund flows have an impact on local equity fund flows with 100 percent of the impact arises from foreign institutional equity fund flows. Furthermore, local institutional equity fund flows

have no impact on foreign institutional and foreign retail equity fund flows. This research also shows that there is bi-directional causality between local retail and foreign institutional equities' fund flows, meaning that both categories of equity fund flows influence each other. However, there is uni-directional causality running from local retail equity fund flows to foreign retail equity fund flows. The finding also reveals that there is no led-lag relationship between foreign institutional equity fund flows and foreign retail equity fund flows. Even though both local institutional and local retail equities' fund flows influence each other, the impact of local institutional equity fund flows on local retail equity fund flows is stronger. As comparison, foreign trades account for more than 50 percent variation in both foreign and local equities' fund flows. Basically, own innovations explain more on the variability in both foreign institutional and retail equities' fund flows, and local retail equity fund flows. However, innovations in other types of equity fund flows in total explain more on the variability in local institutional equity fund flows as opposed to its own innovations. Among the four categories of equity traders, foreign institutional and local retail traders seem to drive the Malaysian equity market. As comparisons, a study by Chiang et al. (2012) revealed that neither foreign and domestic institutional, nor domestic individual investors have been the predominant traders in the Taiwanese market. Additionally, Hong and Lee (2011) found that foreigners and institutional investors tend to drive the Korean equity market. Their trades seem to be information-driven. On the contrary, individual investors do not drive the Korean equity market and their trades do not seem to be information-driven. A study by Lee et al. (1999) on Taiwanese equity market revealed that institutional investors and big individual investors appeared to act independently and; in general, not affected by past trading actions by other groups of investors. In summary, finance literature revealed mixed results on the predominant players in several equity markets. As local retail investors are among the main players, this finding supports the view that Malaysian equity market is retail dominated market. Moreover, as foreign institutions are the key drivers of Malaysian equity market, understanding their trading behaviour is very crucial as this could assist other market participants (investors and fund managers) to develop appropriate investment strategies at Bursa Malaysia. As an example, other market participants could mimic foreign institutions' trading strategies (such as momentum or contrarian strategies) in response to movement of local equity market.

In summary, using aggregate data, this study contributes to the finance literature on the lead-lag relationships among equity fund flows of four main groups of equity investors for an emerging market such as Malaysian equity market. However, for future academic research, it is suggested that other data be employed such as country specific equity fund flows into Malaysian stock market. This is to uncover if investors of different nations perform non-similar investment patterns with respect to

return shock of the local bourse. Additionally, an event study related research could be carried out to determine the impact of major economic events, abroad or domestic, on investors fund flows into the local bourse.

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