

## The Relationship between Trades of Foreign Institutional and Retail Investors and Equity Return

*(Hubungan antara Dagangan Pelabur Institusi dan Runcit Asing dan Pulangan Ekuiti)*

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### ABSTRACT

*This study examined the relationship between equity flows and domestic equity returns using daily aggregate trade data categorized by two foreign investors' classes; namely foreign institutional and retail investors. To explore the relationship between domestic equity returns and both buy and sale trades of foreign institutional and retail investors, this study employed bivariate vector autoregressive model and impulse response functions. The main finding of this study amongst others indicated that past equity returns do impact the sale trades of both foreign institutional and retail investors; however they are inversely related. The findings indicated that foreign institutional investors sell less during market upswing, while foreign retail investors sell more during upside market momentum. The finding of this study also revealed that there is a temporary impact of foreign retail investors' buy trades on domestic equity returns, thus supports the information dissemination concept particularly with regard to price momentum.*

*Keywords: Momentum and contrarian trading strategies; foreign institutional and retail investors; sale and buy trades; vector autoregressive model; impulse response functions; emerging equity market*

### ABSTRAK

*Kajian ini mengkaji hubungan antara aliran ekuiti dan pulangan ekuiti domestik menggunakan maklumat dagangan agregat harian yang dikategorikan mengikut dua kelas pelabur asing iaitu pelabur institusi dan runcit asing. Untuk menguji hubungan antara pulangan ekuiti domestik dan kedua-dua dagangan belian dan jualan pelabur institusi dan runcit asing, kajian ini menggunakan model vektor autoregresif bivariat dan fungsi tindak balas impuls. Hasil utama kajian ini antaranya adalah pulangan ekuiti hari sebelumnya memberi impak terhadap dagangan jualan pelabur institusi dan runcit asing; walau bagaimanapun hubungannya adalah bertentangan antara satu sama lain. Penemuan kajian menunjukkan bahawa pelabur institusi asing kurang melakukan aktiviti penjualan manakala pelabur runcit asing lebih melakukan aktiviti penjualan semasa pasaran menaik. Penemuan kajian ini juga mendapati dagangan belian pelabur runcit asing mempunyai impak sementara terhadap pulangan ekuiti domestik, sekali gus menyokong konsep penyebaran maklumat terutamanya momentum harga.*

*Kata kunci: Strategi dagangan momentum dan kontrarian; pelabur institusi dan runcit asing; dagangan jualan dan belian; model vektor autoregresif; fungsi tindak balas impuls; pasaran ekuiti baru muncul*

### INTRODUCTION

Foreign equity flows are crucial to the stability of financial market especially in emerging countries like Malaysia. Chandra (2012) stated that the growing presence of foreign equity flows enhances the financial markets in terms of market depth, investor diversity and liquidity. Foreign equity flows are highly volatile in nature, and investors react in tandem with the vagaries of global economic situations; geo-political climate and foreign exchange fluctuations; government policies such as capital control and trade liberalization; political and economic situations of the local country; development of local capital market as well as the local industry's performance. Foreign equity flows have been known to move and impact local equity market. For instance, selling pressure by foreign investors will impact the local bourse negatively; and so does the buying pressure that increases demand whereby it resulted in better performance in local stock market. As

foreign institutional and retail investors are among the main players of stock market, it is crucial to study their trading movements and the causal relationships with the local market return. This is because we can gain more insights of their trading behaviours and their impact on emerging bourses such as that of Bursa Malaysia. In-depth knowledge of the behavioural patterns of equity flows particularly in relation to stock market's movements of emerging countries will benefit not only the local and foreign investors, but also the policy makers. For instance, the understanding of the behaviour of foreign equity flows would assist stock market investor especially local traders, both retail and institutional, in their trading strategies at Bursa Malaysia. This is important as different categories of investors may demonstrate diverse and even contrarian trading behaviours. Thus, the interactions between investors' trade and asset prices might occur in various manners.

## LITERATURE REVIEW

There are an abundant of studies that explore the relationship between performance of local equity market and foreign flows of equity capital. Previous studies provided evidences of positive and negative relationships between equity market returns, and foreign capital inflows and foreign capital outflows, respectively. For instance studies by Bohn and Tesar (1996), Brennan and Cao (1997) and Froot, Connell and Seasholes (2001) revealed that strong stock market performance, particularly in terms of returns, attracts the inflows of foreign funds; while weak stock market performance drives capital outflows. Past studies showed that there are two major inter-related areas of researches on the behavioural patterns of investor equity flows, such as foreign equity flows. The first area of study is related to the feedback trading demonstrates by foreign investors particularly at aggregate level. Feedback trading occurs if past equity returns affect investors' current fund flows into the local bourse. There are two types of feedback trading, the first is positive feedback trading; and the second is negative feedback trading. Both the positive and negative feedback trading are also known as momentum and contrarian trading, respectively. Positive feedback trading exists when fund flow is positively and significantly associated to past local market's returns and past fund flows. The investors are considered 'return chaser,' meaning that their trading activities are influenced by equity returns. Their decisions to buy and sale are associated with price increase and price decline, respectively. On the contrary, a negative feedback trading occurs when the relationship between fund's flows and past returns of equity market is negative and significant.

Previous studies on the positive associations between foreign investor's trading activities and equity returns include Adaoglu and Katircioglu (2013), Bohn and Tesar (1996), Brennan and Cao (1997), Chandra (2012), French (2011), French and Li (2012), French and Naka (2013), Froot et al. (2001), Grinblatt and Keloharju (2000), Jinjark, Wongswan and Zheng (2011), Lin (2006), Lin and Swanson (2004), Phansatan et al. (2012) and Samarakoon (2009). Overall, the findings of these studies revealed that foreign equity investors demonstrate positive feedback or momentum trading behaviour in their decisions to buy or sale, respectively. In this scenario, foreign investor purchases more local stocks when the equity market is in the rising trend; that is, they purchase past winning stocks and sell past losers.

Meanwhile, previous studies that showed the direction of causality runs from stock return to foreign equity flows involving emerging markets include Bekaert, Harvey and Lumsdaine (2002), Bohn and Tesar (1996), Brennan and Cao (1997), French and Li (2012), French and Vishwakarma (2013), Samarakoon (2009) and Ülkü and İközlerli (2012). In the study of Bekaert et al. (2002), they provided a proof that positive return shocks have an impact on short-term international equity flows into emerging markets. They related their findings to

momentum effect of equity trading. Even though most of the studies revealed that there are positive relationships between stock returns and foreign equity flows, French and Naka (2013) however, found opposite results. Their study signified that there is an insignificant response to excess returns of positive shocks to U.S. equity inflows into China and India. The inflows of U.S. investors into China and Indian markets are based on the fundamental values and unique characteristics of China and India, respectively.

The second area of research is related to information dissemination concept whereby it is a study of the impact of investor's equity flows on returns; both in short term and long term horizons. If 'noise' instead of fundamental values is incorporated in equity flows, then the impact of equity flows on returns will be temporary rather than permanent. In this situation, the equity prices are said to deviate temporarily from their equilibrium prices due to noise; which creates excess demand for local equities. The long term and short term effects of equity flows on returns are associated with information revelation and price momentum (pressure) respectively. A positive price momentum is said to occur when prices keep increasing following to buy trades or keep declining subsequent to sale trades. Meanwhile, a negative price momentum is observed when prices keep increasing following to sale trades or keeps declining subsequent to buy trades. Examples of previous studies that showed equity flows impact the returns of the local bourse include Chandra (2012), Dahlquist and Robertsson (2004), French and Li (2012), Froot and Ramadorai (2008), Froot et al. (2001) and Ülkü and İközlerli (2012).

Studies on the relationship between foreign equity flows and returns are not only related to developed market but have been carried out on emerging equity markets such as a study by Lin and Swanson (2008) who investigated equity outflows of U.S. residents to several emerging stock markets in Latin America and Asia. Among their findings, it was revealed that information contribution argument explained more about the relationship between foreign equity flows and returns as compared to the feedback trading argument. Thus, the influences of equity flows on returns are stronger than the impact of past return on flows. Besides the study by Lin and Swanson (2008), other studies that explored the same subject include Bekaert et al. (2002), Chandra (2012), Dahlquist and Robertsson (2004), French and Li (2012), Froot and Ramadorai (2008), Froot et al. (2001) and Ülkü and İközlerli (2012). In summary, past literature showed that there are links between equity returns and equity flows in both directions.

With regard to Malaysian equity market, several studies have been carried out to examine the link between foreign equity flows and equity returns such as Bekaert et al. (2002), Bohn and Tesar (1996), Froot and Ramadorai (2008), Froot et al. (2001), Jinjark et al. (2011), Lin and Swanson (2004) and Lin and Swanson (2008). However, most of these studies used old data of foreign equity flows and low-frequency trade data except that of Froot et al. (2001). Examples of studies that employed high-frequency

data of foreign equity flows are Froot and Ramadorai (2008) on weekly data and Bekaert et al. (2002), Bohn and Tesar (1996), Jinjark et al. (2011), Lin and Swanson (2004) and Lin and Swanson (2008) on monthly data. As such, this study differs from previous studies as we employed a more recent and high-frequency data, i.e. on a daily basis. Contrary to low-frequency data, high-frequency data have the ability to detect trading styles, accurately gauge the performance of equity investors as well as precisely capture the dynamics of equity flows and equity returns relationship.

Moreover, contrary to studies by Bekaert et al. (2002), Bohn and Tesar (1996), Froot and Ramadorai (2008), Froot et al. (2001), Jinjark et al. (2011), Lin and Swanson (2004) and Lin and Swanson (2008), the impact of equity returns on both sale and buy trades; and vice versa is examined separately instead of using the net fund flows as the testing variable. This is consistent with study of Chiang, Tsai, Shu and Chen (2012) who perceived that the buy and sale trades of investors might be asymmetric; thus, it is appropriate to analyse the investors' buying and selling behaviours separately. In view of this, the buy or sale trade that has strong association with equity return can be easily identified. In addition, in this study the equity flows data are both in terms of quantities and values. Unlike previous studies, the equity flows used in this study include all foreign equity flows; not only the equity flows from the U.S. investors. Furthermore, different from previous studies, this study was carried out specifically on the Malaysian stock market. Due to restriction on the availability of data, past studies grouped their data according to certain categories; such as region (i.e. Europe, U.S., Asian, Middle East) and the maturity of the stock market (i.e. developed, developing, emerging).

Prior study by Ahmed (2014) asserted that trading pattern and investment performance of a particular group of investors within a particular country can cast light on some meaningful issues, such as composition of stock market, transmission of information, formation of asset price; and the level of stock market's efficiency and liquidity. Thus, besides contributing to the body of literature on the topic of behavioural finance particularly of emerging economies, the findings of this study are not only benefiting local traders but the policymaker of host country as well. For instance, sizeable net stock purchases (sales) by foreign investors both institutional and retail suggest that they believe the market is undervalued (overvalued) in relation to the alternatives. Hence, the local investors either institutional or retail as well as fund managers can devise profitable trading strategies of either to enter or exit the stock market in order to maximize their returns. Choe, Kho and Stulz (1999) emphasized that in some models, positive feedback trading can lead to stock market bubbles. A bubble occurs when there is high demand for a particular stock which drives up the price over its true value. When the bubbles burst, there will be a stock market crash; whereby there is an unanticipated drop in stock prices. In addition, positive feedback trading

also contributes to stock market volatility as well as capital flows destabilization whereby the investors flock into (out) of countries during stock market booming (falling). Accordingly, by understanding the behaviours of foreign investors both institutional and retail in terms of equity purchases, Malaysian policymakers would be able to establish policies and approaches in order to attract foreign investors to invest in Malaysian equity market. The sale trades of foreign equity investors can dampen the equity prices of local stock markets. Thus, not only the buy trades but the sale trades of local equities also need to be understood by Malaysian policymakers as well as local investors. However, the main challenge to the policymakers is the measuring of the impact of foreign equity flows into and out of Malaysian stock market especially during bad and unstable world's economic conditions. During recession, changes in foreign equity flows become crucial since the danger of adverse capital flow grows even stronger.

Therefore, this study seeks to examine the link between equity returns of local equity market and international equity flows. In order to investigate the relationship between these two main endogenous variables, this study employed a vector autoregressive (VAR) model as well as impulse response functions. This study attempted to fill a gap in the knowledge by exploring the association by using more recent and higher frequency data. The remainder of this paper is organised in the following manner. Section 2 discusses the data and methodology employed in this study. Section 3 presents the findings; and lastly Section 4 provides the conclusion of this paper.

#### DATA AND METHODOLOGY

This study utilised an aggregate data of daily equity flow of funds by foreign investors both institutional and retail investors. The main data of this study are the buy and sale trades of foreign investors, both institutional and retail investors, into and out of Malaysian stock market obtained from the Bursa Malaysia. The buy and sale trades of foreign institutional and retail investors are in the form of value of trades (in Ringgit Malaysia) and number of shares traded. The data on equity purchase and sale by foreign investors are only made available starting October 2009, hence, the sample period for this study covers from October 2009 until February 2013. In total, there are 838 daily aggregate buy and sale trades equity data of foreign institutional and retail investors respectively.

Another main variable employed in this study was stock market return and it is based on the closing values of FBMKLCI (also referred as FTSE Bursa Malaysia KLCI) index. The FBMKLCI is a capitalization-weighted stock market index. It consists the 30 largest companies, based on market capitalization, listed on the Main Market of Bursa Malaysia.

The stock market return is calculated as the followings:

$$KLCIR = (IND_t - IND_{t-1}) / IND_{t-1}$$

Where,

KLCIR = Return of FBMKLCI index,

IND<sub>t</sub> = Closing value of FBMKLCI index on day t,

IND<sub>t-1</sub> = Closing value of FBMKLCI index on day t-1.

In this study, a bivariate vector autoregressive (VAR) model was employed to determine the joint interaction between foreign institutional and retail investors' trading activities and equity returns. This method has been utilised by other researchers in similar studies such as Samarakoon (2009). In the VAR system, the flows of foreign equity, both buy and sale trades; and domestic index returns are treated as endogenous variables. The VAR model has several advantages, one of which is its characteristic that enables each variable in the system to be treated symmetrically. Moreover, the variables in the system are permitted to influence each other, thus this allows feedback to be incorporated in the analysis (Enders 2004).

As stated, this study will utilise the VAR model to relate foreign investors' buy and sale trades to past equity returns, and vice versa. If equity index returns positively and significantly affect the trades of foreign institutional and retail investors, this suggests that foreign equity investors pursue a momentum or positive feedback trading strategy. In this situation, the investors buy more (than sell) when domestic equity market is in upward trend. On the contrary, if the equity index returns negatively and significantly influence the trades of foreign institutional and retail investors, then it is said that the investors follow a contrarian trading strategy. In this scenario, the investors tend to trade in the opposite direction to the past movement of domestic equity returns. Thus, following to a positive stock market movement, they will sell more of the local equities, rather than buying them. With regard to the association between index returns and past trades of foreign institutional and retail investors, a positive price momentum is observed if prices keep rising and falling following to equity purchases and sales, respectively. Inversely, a negative price momentum is observed when the opposite occurs (Samarakoon 2009).

According to information revelation and price pressure propositions, there are short term and long term effects of flows on returns, respectively. Therefore, in this study, we extended the VAR approach by utilising the impulse response functions to further examine the impact of fund flows on equity return, i.e. whether it is permanent or temporary. The impulse response functions are able to quantify the response of a variable to shocks in other variables. Thus, in this study, the information dissemination effects (i.e. whether it is short-term or long term basis) can be tested. If the response of returns to flow innovations is short term, then it can be said that the effect of equity flows on equity returns is explained by price pressure hypothesis instead of information revelation hypothesis. In order to run VAR model, all the time series data used in this study need to be stationary and the optimal

lag length need to be determined. Therefore, this study carried out a unit-root test to determine the nonstationarity of the variables as proposed by Dickey and Fuller (1979, 1981). The determination of the appropriate number of lags is based on the Akaike Information Criterion (AIC).

## RESULTS AND DISCUSSIONS

### DESCRIPTIVE STATISTICS

The summary statistics of all variables utilise in this study, namely: domestic equity returns (KLCIR); buying transactions of foreign investors both institutional and retail in the form of number of shares traded (FIBVOL and FRBVOL); selling transactions of foreign investors both institutional and retail in the form of number of shares traded (FISVOL and FRSVOL); buying transactions of foreign investors both institutional and retail in the form of value of trades (FIBVAL and FRBVAL) and selling transactions of foreign investors both institutional and retail in the form of value of trades (FISVAL and FRSVAL) for a period from October 2009 until February 2013 are reported in Table 1.

Panel A of Table 1 describes the statistics of buy and sale trades for local equities, both by foreign institutional and retail investors based on number of shares traded. Meanwhile, Panel B describes the statistics of buy and sale trades for local equities, both by foreign institutional and retail investors based on value of trades. The mean values of FIBVOL and FISVOL; and FRBVOL and FRSVOL of Panel A show that on average, foreign investors buy more than sell for the sample period used in this study. The results in Panel B of Table 1 also provide similar findings except for the trading activities of foreign retail investors where the investors sell more (than purchase) of local stocks.

Table 1 also reports the Augmented Dickey-Fuller (ADF) test statistics together with their respective critical values for all data series. The figures of ADF test statistics show that there is no unit root for the data series under study. All the time series of FIBVOL, FISVOL, FRBVOL, FRSVOL, FIBVAL, FISVAL, FRBVAL and FRSVAL are stationary at level while the time series of KLCIR are stationary at first difference. The stationarity of the data enables this study to proceed with bivariate VAR to explore the link between equity returns and foreign institutional and retail investors' buy and sale trades. The characteristics of the data also allow this study to perform impulse response functions to determine the impact of foreign institutional and retail investors' buy and sale trades of equity on domestic equity returns, i.e. whether it is temporary or permanent.

### CORRELATION COEFFICIENTS

The correlation coefficients between local equity returns (KLCIR) and eight measures of foreign investors' fund flows are reported in Table 2. The cross correlation between local equity returns and foreign investors' fund flows provides preliminary insights about the

TABLE 1. Descriptive statistics

Variables	Mean	Min	Max	Std Dev	ADF	J-BERA
Panel A: Trading activities of foreign investors based on number of shares traded						
FIBVOL	101.918	18.570	469.610	43.576	13.959**	5846.382**
FISVOL	96.102	13.370	392.190	38.682	14.424**	5977.424**
FRBVOL	10.381	2.050	45.410	5.255	4.149**	896.190**
FRSVOL	10.131	1.840	58.910	5.738	5.038**	4779.299**
Panel B: Trading activities of foreign investors based on value of trades						
FIBVAL	417.400	82.020	2423.310	201.841	5.782**	15526.35**
FISVAL	375.660	39.680	1853.320	184.129	5.036**	6180.782**
FRBVAL	7.074	1.550	26.960	3.127	5.816**	1369.404**
FRSVAL	7.876	1.570	39.980	3.747	8.226**	4205.449**
Panel C: FBMKLCI						
KLCIR	0.0003	-0.024	0.024	0.005	25.295**	178.263**

Note: The symbol \*\* denotes the figures are significant at 1% level. The time series of FIBVOL, FISVOL, FRBVOL, FRSVOL, FIBVAL, FISVAL, FRBVAL and FRSVAL are stationary at level. The time series of KLCIR are stationary at first difference. FIBVOL and FRBVOL represent the buying transactions of foreign investors both institutional and retail in the form of number of shares traded; FISVOL and FRSVOL represent the selling transactions of foreign investors both institutional and retail in the form of number of shares traded; FIBVAL and FRBVAL represent the buying transactions of foreign investors both institutional and retail in the form of value of trades and FISVAL and FRSVAL represent the selling transactions of foreign investors both institutional and retail in the form of value of trades. Jarque-Bera normality test shows that all the time series data are not normal at 1 percent level.

relationships between returns and foreign investors' buy and sale trades of local bourse's equities. The findings of this study revealed that equity returns and buy trades of local equities by foreign institutional investors both, based on volume of shares traded and value of trades, are positively and significantly correlated at 1 percent level. In addition, the results in Panel B of Table 2 show that the correlation between equity returns and sale trades of foreign institutional investors is negative and significant at 1 percent level.

Meanwhile, the correlation coefficients between equity returns; and buy and sale trades of foreign retail investors for local equities are significantly negative and positive at

5 percent and 1 percent level, respectively. However, the significant correlations between equity returns; and buy and sale trades of equity are only applied to trading based on value of trades. The findings also demonstrated that the buy and sale trades of foreign institutional investors are in the opposite direction as compared to buy and sale trades of foreign retail investors. Foreign institutional investors are said to follow a momentum or positive feedback trading strategies whereby they buy more and sell less shares when the equity market is in upward trend. Meanwhile, foreign retail investors are said to follow a contrarian trading strategy whereby they sell more and buy less shares during market 'upswing.'

TABLE 2. Correlation coefficients

Panel A: Quantity of Trades						
		KLCIR	FIBVOL	FISVOL	FRBVOL	FRSVOL
Spearman's rho	KLCIR	1.000	.175**	-.017	-.027	.067
	FIBVOL		1.000	.660**	.202**	.194**
	FISVOL			1.000	.277**	.192**
	FRBVOL				1.000	.615**
	FRSVOL					1.000
Panel B: Value of Trades						
		KLCIR	FIBVAL	FISVAL	FRBVAL	FRSVAL
Spearman's rho	KLCIR	1.000	.237**	-.093**	-.075*	.209**
	FIBVAL		1.000	.650**	.221**	.331**
	FISVAL			1.000	.299**	.211**
	FRBVAL				1.000	.553**
	FRSVAL					1.000

Note: The symbols \*\* and \* denote the figures are significant at 1% and 5% level respectively. Spearman Rank correlation test is used due to the non-normality of the time series data. FIBVOL and FRBVOL represent the buying transactions of foreign investors both institutional and retail in the form of number of shares traded; FISVOL and FRSVOL represent the selling transactions of foreign investors both institutional and retail in the form of number of shares traded; FIBVAL and FRBVAL represent the buying transactions of foreign investors both institutional and retail in the form of value of trades and FISVAL and FRSVAL represent the selling transactions of foreign investors both institutional and retail in the form of value of trades.

The preliminary results of correlation coefficients in Table 2 reveal that both foreign institutional and retail investors employ different trading strategies in response to positive momentum of domestic equity market's performance.

#### VECTOR AUTOREGRESSIVE ESTIMATES

The findings of this study, based on vector autoregressive model of the relationship between domestic equity returns and foreign investors' buy and sale trades of local equities, are reported in Table 3, Table 4 and Table 5. The results in Panel A of Table 3 demonstrate that current domestic equity return is significantly and positively related to its return in the previous day. Furthermore, the sale trades of both foreign institutional and retail investors are significantly influenced by lagged equity returns at 1 percent level. However, the relationships are in the opposite directions. The results suggest that both groups of investors behave differently with regard to the performance of local equity market. Foreign institutional investors sell less during

market upswing, while foreign retail investors sell more during upside momentum. These relationships show that foreign institutional investors follow momentum trading strategies, while foreign retail investors follow contrarian trading strategies in sale trades of local equities. The results in Panel B of Table 3 are similar to the results in Panel A; with the exception that lagged local equity returns also influence the buy trades of local stocks by foreign retail investors. The relationship is negative and significant at 5 percent level. The results show that foreign retail investors follow contrarian trading strategies by buying less local equities during market uptrend. In short, the trading behaviour of foreign retail investors is similar to studies such as Adaoglu and Katircioglu (2013), Bekaert et al. (2002), Bohn and Tesar (1996), Brennan and Cao (1997), Chandra (2012), French (2011), French and Li (2012), French and Naka (2013), French and Vishwakarma (2013), Froot et al. (2001), Grinblatt and Keloharju (2000), Jinjark et al. (2011), Lin (2006), Lin and Swanson (2004), Phansatan et al. (2012), Samarakoon (2009) and Ülkü and İkizlerli (2012).

TABLE 3. Vector autoregressive estimates: Impact of returns on equity flows by type of Investor

Panel A: Quantity of Trades					
	KLCIR	FIBVOL	FISVOL	FRBVOL	FRSVOL
KLCI with 1 lag	0.136 (3.708)**	-124.892 (-0.488)	-610.026 (-2.632)**	-5.739 (-0.208)	99.647 (3.282)**
KLCI with 2 lags	0.012 (0.348)	-137.730 (-0.538)	-105.219 (-0.453)	-15.615 (-0.567)	44.384 (1.461)
Panel B: Value of trades					
	KLCIR	FIBVAL	FISVAL	FRBVAL	FRSVAL
KLCI with 1 lag	0.122 (2.912)**	-348.023 (-0.248)	-2500.604 (-2.063)*	-44.472 (-2.497)*	62.762 (2.776)**
KLCI with 2 lags	0.020 (0.510)	411.911 (0.304)	832.299 (0.710)	-5.724 (-0.332)	15.857 (0.726)

Note: The symbols \*\* and \* denote the coefficients are significant at 1% and 5% level respectively. Figures in ( ) are the t-statistics. FIBVOL and FRBVOL represent the buying transactions of foreign investors both institutional and retail in the form of number of shares traded; FISVOL and FRSVOL represent the selling transactions of foreign investors both institutional and retail in the form of number of shares traded; FIBVAL and FRBVAL represent the buying transactions of foreign investors both institutional and retail in the form of value of trades and FISVAL and FRSVAL represent the selling transactions of foreign investors both institutional and retail in the form of value of trades.

TABLE 4. Vector autoregressive estimates: Impact of equity flows (quantity of trades) on return by investor type

	KLCIR	FIBVOL	FISVOL	FRBVOL	FRSVOL
Panel A: Buy trades by foreign institutional investors (FIBVOL)					
With 1 lag	0.000 (-1.528)	0.386 (7.010)**	0.0370 (0.742)	0.000 (-0.091)	0.000 (0.017)
With 2 lags	0.000 (0.941)	0.197 (3.621)**	0.010 (0.216)	0.000 (0.135)	0.001 (-0.254)
Panel B: Sale trades by foreign institutional investors (FISVOL)					
With 1 lag	0.000 (1.062)	-0.110 (-1.835)	0.217 (3.984)**	0.003 (0.519)	-0.007 (-1.029)
With 2 lags	0.000 (-1.075)	-0.055 (-0.926)	0.122 (2.271)*	0.003 (0.479)	0.003 (0.518)

Continued

Continue

	KLCIR	FIBVOL	FISVOL	FRBVOL	FRSVOL
Panel C: Buy trades by foreign retail investors (FRBVOL)					
With 1 lag	0.000 (-1.834)	0.301 (0.852)	0.465 (1.450)	0.321 (8.458)**	0.261 (6.229)**
With 2 lags	0.000 (0.130)	0.410 (1.142)	0.492 (1.513)	0.151 (3.911)**	0.125 (2.933)**
Panel D: Sale trades by foreign retail investors (FRSVOL)					
With 1 lag	0.000 (1.675)	0.253 (0.790)	0.240 (0.827)	0.132 (3.830)**	0.243 (6.397)**
With 2 lags	0.000 (-0.769)	-0.352 (-1.118)	-0.132 (-0.462)	0.079 (2.343)*	0.104 (2.798)**

Note: The symbols \*\* and \* denote the coefficients are significant at 1% and 5% level respectively. Figures in ( ) are the t-statistics. FIBVOL and FRBVOL represent the buying transactions of foreign investors both institutional and retail in the form of number of shares traded; FISVOL and FRSVOL represent the selling transactions of foreign investors both institutional and retail in the form of number of shares traded; FIBVAL and FRBVAL represent the buying transactions of foreign investors both institutional and retail in the form of value of trades and FISVAL and FRSVAL represent the selling transactions of foreign investors both institutional and retail in the form of value of trades.

TABLE 5. Vector autoregressive estimates: Impact of equity flows (value of trades) on return by investor type

	KLCIR	FIBVAL	FISVAL	FRBVAL	FRSVAL
Panel A: Buy trades by foreign institutional investors (FIBVAL)					
With 1 lag	0.000 (-1.003)	0.369 (5.716)**	0.006 (0.107)	0.000 (-0.362)	0.000 (-0.343)
With 2 lags	0.000 (-0.953)	0.097 (1.554)	-0.094 (-1.738)	0.000 (0.376)	0.000 (-0.624)
Panel B: Sale trades by foreign institutional investors (FISVAL)					
With 1 lag	0.000 (0.960)	-0.115 (-1.624)	0.264 (4.290)**	0.000 (0.697)	0.000 (-0.350)
With 2 lags	0.000 (0.477)	0.040 (0.593)	0.248 (4.157)**	0.000 (-0.359)	0.000 (0.291)
Panel C: Buy trades by foreign retail investors (FRBVAL)					
With 1 lag	0.000 (-2.218)*	0.772 (0.245)	3.651 (1.340)	0.303 (7.576)**	0.127 (2.502)*
With 2 lags	0.000 (-0.835)	2.207 (0.725)	4.172 (1.582)	0.166 (4.299)	0.086 (1.764)
Panel D: Sale trades by foreign retail investors (FRSVAL)					
With 1 lag	0.000 (0.929)	0.527 (0.206)	-0.285 (-0.129)	0.186 (5.723)**	0.421 (10.209)**
With 2 lags	0.000 (0.946)	0.768 (0.300)	2.444 (1.101)	0.056 (1.735)	0.089 (2.162)*

Note: The symbols \*\* and \* denote the coefficients are significant at 1% and 5% level respectively. Figures in ( ) are the t-statistics. FIBVOL and FRBVOL represent the buying transactions of foreign investors both institutional and retail in the form of number of shares traded; FISVOL and FRSVOL represent the selling transactions of foreign investors both institutional and retail in the form of number of shares traded; FIBVAL and FRBVAL represent the buying transactions of foreign investors both institutional and retail in the form of value of trades and FISVAL and FRSVAL represent the selling transactions of foreign investors both institutional and retail in the form of value of trades.

Based on the results in Table 4 and Table 5, both the buy and sale trades of foreign investors do not have significant impact on local equity returns except for the buy trades of foreign retail investors. The buy trades of foreign retail investors have a small negative impact on local equity returns and it is significant at 5 percent level. The significant impact of foreign retail investors' buy trades on domestic equity return is consistent with the

findings of other studies such as Bekaert et al. (2002), Chandra (2012), Dahlquist and Robertsson (2004), French and Li (2012), Froot and Ramadorai (2008), Froot et al. (2001) and Ülkü and İkizlerli (2012) but contrary to the findings of Chiang et al. (2012) on Taiwan stock market. Chiang et al. (2012) documented that neither the buy nor sale trades of equities has an impact on Taiwan's stock price index. In summary, the findings of this study

documented the existence of relationship between equity returns and foreign equity flows and vice versa even though the relationship for the latter is less substantial. Chandra (2012) also documented similar findings in Indian stock market.

#### IMPULSE RESPONSE

This study provided alternative perspectives on the impact of past returns on flows as well as the impact of past flows on return by examining the impulse response functions. Figure 1 shows the impulse response functions for 10-period responses of one variable to one unit of standard deviation innovations in another variable. The reported impulse response functions in Figure 1 are based on volume of shares traded. The focus of the discussions in this section is on the responses of buy and sale trades to returns innovations as well as the responses of returns to buy and sale trades innovations. Figure 1 shows that there is a positive response of institutional buy trades following to innovations in returns. The responses are relatively large in magnitude and diminish to zero after 9 days. The response of retail purchase to innovations in returns shows an opposite patterns as those of institutional purchase; however the responses are much longer. The negative response of retail purchase to innovation in returns persisted even after day 10. In addition, Figure 1 shows that the response of institutional sale trades to innovations in returns is negative and diminishes to zero after 10 days. The response of retail sale trades to return innovations is positive and the magnitude is much smaller as compared to the response of retail buy trades to innovation in returns.

Meanwhile, the response of returns is only remarkable to one standard deviation innovation in buy trades by foreign retail investors. The equity return decreases sharply slightly above zero on day 2 and approaches zero on day 4. The results of this study show a short-term response of return to innovations in buy trades of foreign retail investors. This is consistent with price pressure hypothesis whereby the response of returns to flow innovations is temporary and able to reverse immediately. Overall, the results of impulse response functions in Figure 1 show that the responses of both buy and sale trades to return shock are stronger than the responses of return to shocks in purchase and sale trades of local equity by foreign investors.

Figure 2 displays the impulse response functions of buy and sale trades to innovation in returns as well as impulse response functions of returns resulting from shock in buy and sale trades, respectively. However, the buy and sale trades are based on value of trades. The response of buy trades by foreign institutional investors to return shock is positive and over 150 basis points in day 1. The response of buy trades by foreign institutional to returns shocks then reduces sharply to 50 basis points on day 2 and gradually declines towards zero after day 7. The magnitude of response of sale trades by foreign

institutional investors is more than the response of buy trades by foreign institutional investors to one unit innovations in returns. The response of sale trades by foreign institutional investors to return shocks is slightly above 80 basis points in day 1, sharply decreases to 20 basis points in day 2 and gradually approaches zero.

The response of foreign retail purchase to innovations in return is in opposite direction. It increases up to 2.3 basis points in day 1 and declines to 0.9 basis points in day 2. After day 2, the response of foreign retail purchase to shock in returns gradually reduces towards zero. The response of foreign retail sales to innovation in returns is positive and is in the same direction as the movement in returns. There is slightly greater response in equity purchase as compared to sale by foreign retail investors to innovation in returns. In addition, it is observed that there are different patterns of response between foreign institutional and foreign retail purchase respectively to innovation in returns. Even though return innovations impact both foreign institutional and retail's buy and sale trades, return innovations have the most impact on the buy trades of foreign retail investors and sale trades of foreign institutional investors. The results demonstrated that foreign retail investors follow contrarian trading strategies and momentum trading strategies in their buy and sale trades, respectively. In addition, the findings also exhibit that foreign institutional investors follow momentum trading strategies in buy trades and contrarian trading strategies in sale trades.

Figure 2 also demonstrates the response of returns to one standard deviation innovations in foreign flows of both foreign institutional and retail investors. However, the substantial response of local equity returns are due to shocks in buy trades by foreign retail investors. Based on Figure 2, the response is negative whereby equity returns increase nearly up to 0.06 basis points on day 1 and then sharply reduce to below 0.001 basis points on day 2 following to shock in buy trades of foreign retail investors. After day 2 the equity returns keep declining and reach zero on day 4.

Based on the results of impulse response functions in both Figure 1 and Figure 2, the findings of this study show that the response of return to shocks in equity flows, particularly the buy trades of foreign retail investors, is not permanent. The response of return to innovations in equity purchase by foreign retail investors decay rapidly, which is within 10 trading days. This suggests that the shock in buy trades of foreign retail investors represents demand shocks instead of reacting to changes in market's fundamental. The temporary impact of buy trades by foreign retail investors on domestic equity returns supports the information dissemination concept particularly the price momentum. This finding is similar to the findings of Lin and Swanson (2004), Boyer and Zheng (2009), Chandra (2012) and Jinjark et al. (2011). In another study by Bekaert et al. (2002), however, the response of returns to innovation in equity flows is neither solely temporary nor permanent. The positive effect of



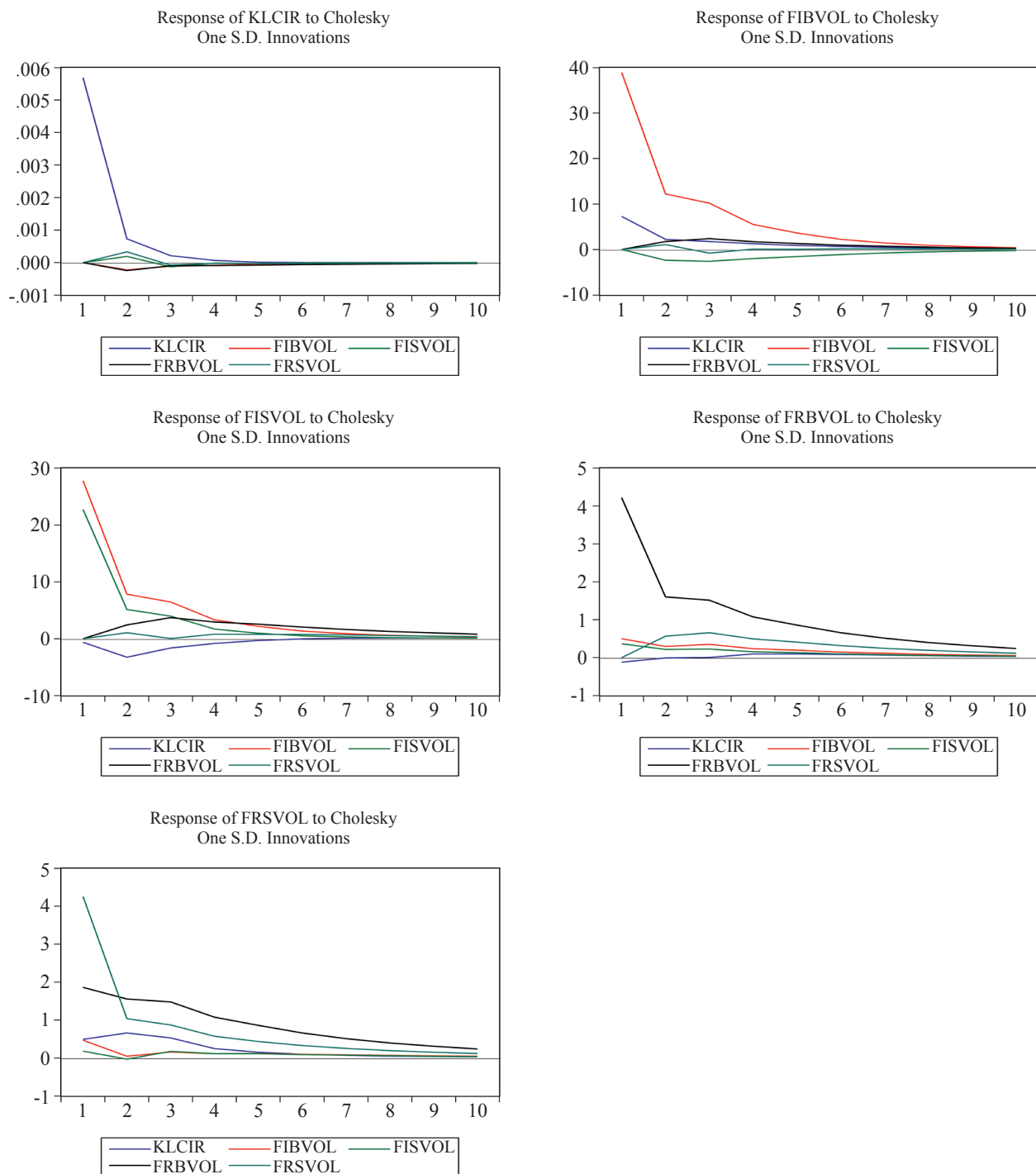


FIGURE 1. The plots of impulse response functions of returns (KLCIR) to shock in buy trades (FIBVOL and FRBVOL) and sale trades (FISVOL and FRSVOL), and vice versa up to 10 trading days. The parameters are from the VAR estimates reported in Table 3, Table 4 and Table 5.

equity flows on returns immediately dies out but involves incomplete reversal; suggesting that some of the effects are permanent.

In short, understanding the behavioural pattern of foreign equity flows is crucial to various parties such as domestic investors, fund managers and policymakers of the host country. For instance, Malaysian government has liberalized its equity market whereby foreign investors as

well as local investors are allowed to invest in domestic and foreign equity securities respectively. Thus, based on the results of this study, developing countries like Malaysia should be cautious in opening its equity market due to a temporary impact of flows on returns which tend to be reversed instantly. This is consistent with the argument that the benefits of equity market liberalization may not be fully realised in emerging market as a result

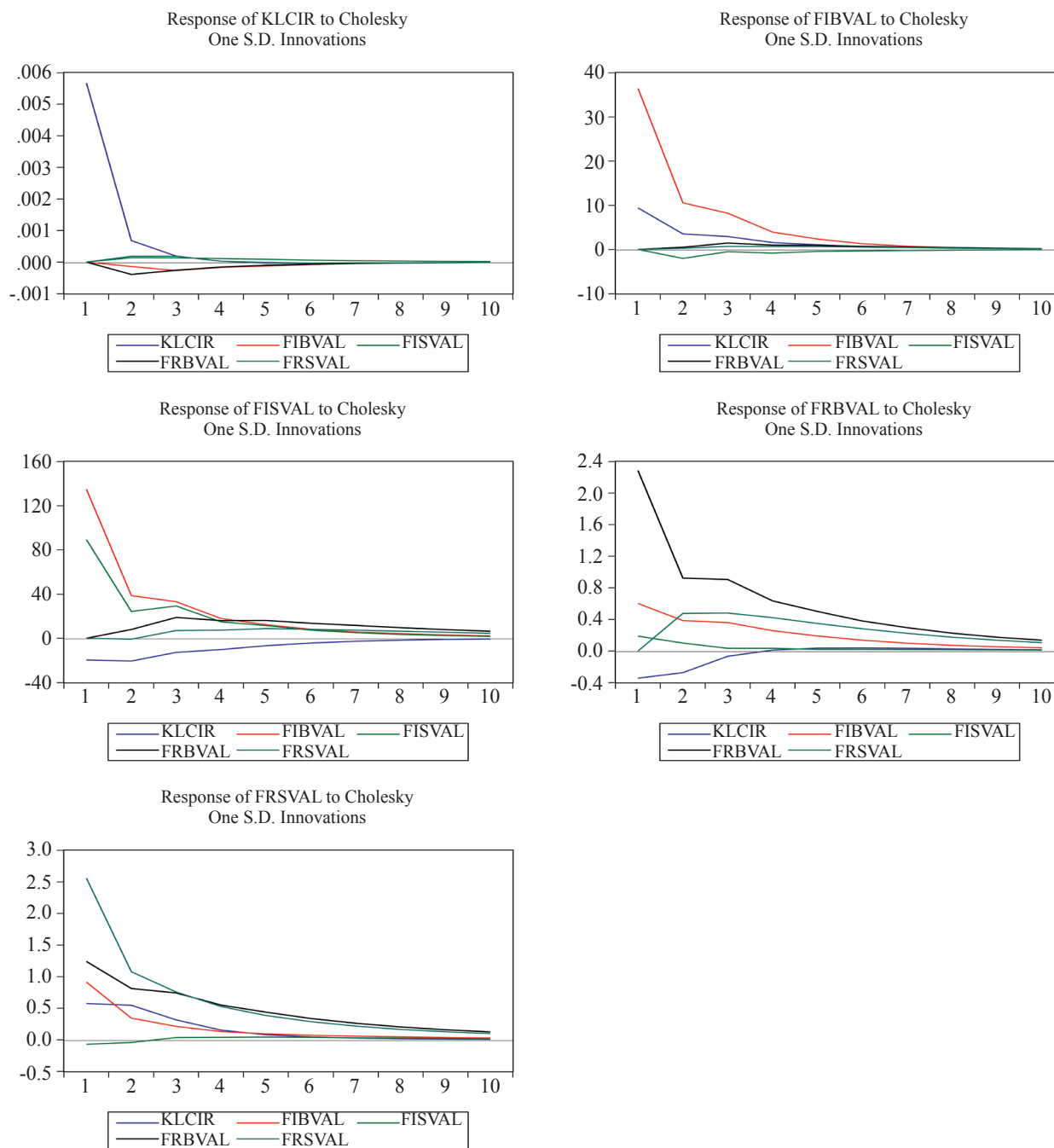


FIGURE 2. The plots of impulse response functions of returns (KLCIR) to shock in buy trades (FIBVAL and FRBVAL) and sale trades (FISVAL and FRSVAL), and vice versa up to 10 trading days. The parameters are from the VAR estimates reported in Table 3, Table 4 and Table 5.

of cross-border equity flows in the situation where flows affect local equity market performance in the absence information (Lin & Swanson 2004).

SUMMARY AND CONCLUSIONS

This paper investigated the dynamic relationship between local equity returns and foreign investors' fund flows into local equity market; categorised by two classes of foreign investors, namely foreign institutional and retail

investors. The domestic equity returns were calculated based on FBMKLCI index, while foreign investors' fund flows were based on the buy and sale trades of both foreign institutional and retail investors. The key study of this research is to examine the link between domestic equity returns and fund flows of foreign investors using bivariate vector autoregressive models as well as impulse response functions. This enables us to explore not only the behavioural pattern of foreign equity flows but also the impact of foreign equity flows on the performance of local stock market, i.e. whether it is temporary or permanent.

On the topic of the links between buy and sale trades; and past equity returns, the findings of this study showed that past equity returns significantly impact the sale trades of both foreign institutional and retail investors. However, the relationships are opposite of each other. Foreign institutional investors sell less during market upswing, while foreign retail investors sell more during upside momentum. These relationships revealed that foreign institutional investors follow contrarian trading strategies, while foreign retail investors follow momentum trading strategies in sale trades of local equities. In addition, the findings also showed that foreign retail investors employ contrarian trading strategies, while foreign institutional investors follow momentum trading strategies in their buy trades of equity during market uptrend. Return innovations have the most impact on the buy trades of foreign retail investors. On the contrary, return innovations mostly influence the sale trades of foreign institutional investors. These findings are consistent with the findings of past studies whereby both the institutional and retail investors react differently following to an equity market movement. On the subject of the links between equity returns and both the buy and sale trades of foreign investors, the findings showed that there is a temporary impact of buy trades by foreign retail investors on domestic equity returns; thus, supports the information dissemination concept especially the price momentum. In conclusion, the findings of this study showed that there are distinctive trading behaviours between foreign institutional and retail investors in relation to the performance of Malaysian equity market. The findings of this study contributed to the existing literature on the area of behavioural finance particularly the trading behaviour of foreign investors investing in emerging equity markets.

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