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Foreign Equity Flows on the Stock Exchange of Thailand

[ABSTRACT]

THIS study conducts an analysis of the impact of foreign equity flows on the Stock Exchange of Thailand and their determinants on a daily, weekly, and monthly basis, using data between January 1995 and April 2005. By using Vector Autoregressive (VAR) model, this study finds that foreign investors exhibit positive-feedback trading behavior and their actions exert a strong positive and permanent price impact on the Thai stock market. Besides the domestic return, international equity returns - namely MSCI World return, MSCI Emerging Markets return, and MSCI Asia ex Japan return - significantly determine foreign equity flows to the Thai bourse. In contrast, changes in exchange rate levels and international interest rates do not significantly affect on foreign equity flows.

1. Introduction

FOREIGN equity investment has an important role in accelerating capital market growth in emerging markets. Bekaert and Harvey (1998) find that after net equity increases due to the capital market liberalization, real per capita GDP growth of 16 emerging markets increases from 2.73% to 2.98%. In Thailand, during 1995-2005, foreign investors' transactions account for approximately 30% of daily transaction[1]. Given their active participation, foreign traders can have significant effects on Stock Exchange of Thailand (SET).

This study explores daily, weekly, and monthly data from January 1995 to April 2005 in order to examine the impact of foreign equity flows on domestic return in the pre-Asian financial crisis (Jan. 95 - Apr. 97), the crisis, (Jul. 97 - Oct. 99), the early post-crisis (Jan. 00 - Apr. 02), and the late post-crisis (Jan. 03 - Apr. 05). In addition, the analysis with different frequencies allows investigation whether the findings are persistent. Regarding the fact that foreign investors can have significant impact on Thai stock market, besides studying the price impact of their trading, this paper also analyzes the determinants of foreign equity flows by incorporating international equity returns and some

macroeconomic variables, such as exchange rate and international interest rates, as exogenous factors into the analysis.

In general, there is a large number of existing literature focusing on foreign equity flows' impact on emerging markets including Thai stock market. Nevertheless, there are some gaps. Early literature during 1990s try to investigate roles of local and global factors that determine portfolio flows to the emerging markets with international interest rates as a main global factor considered (Fernandez-Arias, 1996; Taylor and Sarno, 1997). However, there is a severe limitation in the data employed. The capital flows are obtained from quarterly or monthly data whose low frequency results in poor statistical precision. Therefore, it would be more appropriate to use higher frequent data so as to better examine lead-lag dynamics between the said variables.

More recent literature focus on the relationship between portfolio flows and equity returns. One comprehensive study is the work of Froot, O'Connell, and Seasholes (2001) who explore daily international portfolio flows into and out of 44 countries. They find that flows are strongly influenced by past returns and the sensitivity of local stock prices to foreign inflows is positive and large. However, their data set covers only particular groups of investors since the data comes from State Street Bank & Trust, a large custodian bank. Moreover, they estimate model without taking external factors into account. This study finds similar result but the price impact of foreign equity flows is more short-lived than that found in their work.

One recent study is the work of Griffin, Nardari, and Stulz (2002) who exploit data on foreign flows from nine developing markets. They find that equity flows are positively related to host country stock returns as well as equity returns aboard. In this study, additional result is found in that foreign equity flows also has negative relationship with equity return abroad, specifically, Asian return. Nevertheless, they estimate Vector Autoregressive (VAR) model only over the full sample which starts from January

[1] *Local retail investors account for as much as 60% to 70% of daily trade, compared to less than 10% share for local institutional investors.*

1997 to February 23, 2001. Since Thai economy faces the economic crisis during mid-year of 1997, it is more appropriate to estimate model by separating time frame into sub-periods in order to obtain more complete results for each period.

By using a Vector Autoregressive (VAR) model as a main econometric tool, this study finds a strong positive contemporaneous relationship between foreign equity flows and SET index return in all frequencies. However, there exists price pressure effect since lagged flows have negative impact on domestic return. As a whole, increasing foreign equity flows lead to permanent increase in local return. This could be implied that foreign investors bring information into Thai stock market. When investigating the determinants of foreign equity flows, equity returns in other markets as well as domestic return are found to be significant determinants on a daily basis. In the long run, macroeconomic variables, i.e., exchange rate and international interest rates, do not have significant impact on foreign equity flows.

The rest of this paper is organized as follows. The second section presents related literature. The third section describes data description. The fourth section presents empirical design and results, and final section provides the conclusion of the paper.

2. Related Literature

FROM the late 1980s, large capital flows (in the form of bond and equity) streamed into a number of developing countries. One obvious reason is broader liberalization of financial markets in those countries. However, it is not the only reason; researchers also study details about the factors motivating those capital flows. One related question is whether capital flows are being 'pushed' by adverse conditions in source countries or 'pulled' by attractive conditions in recipient countries.

Chuhan, Claessens, and Mamingi (1998); Taylor and Sarno (1997) find that both push and pull factors are equally significant in explaining monthly US capital flows into developing countries from 1988 to late 1992. The main push factors are US interest rates and US industrial production, which exert negative influence on flows. Nevertheless, Taylor et al. (1997) find that equity flows are relatively more responsive than bond flows to changes in countries-specific factors (e.g. domestic return and country's credit rating). This finding contrasts with that of Chuhan et al.'s (1998).

After the Asian crisis in 1997, considerable research effort has been placed in examining relationship between foreign equity flows and domestic stock returns, on which trading behavior of foreign investors and impacts of their trading on local equity prices are focused. This is due to the fact that foreign investors are often viewed as the ones influencing prices in many markets, especially during the crisis.

Karolyi (1999) examines foreign portfolio flows in Japanese market whereas Choe, Kho, and Stulz (1998) investigate such flows in Korean market. However, they come up with consistent conclusions that foreigners exhibit positive-feedback trading behavior although with weaker evidence during the crisis[2]. In addition, they find no evidence that foreign trading has a destabilizing effect.

Froot, O'Connell and Seasholes (2001) show the results from a bivariate Vector Autoregressive (VAR) model that there exists significant forecasting power of flows for future emerging market returns. They claim that foreign investors tend to be well informed. They also find an evidence of positive-feedback trading since returns help predict fund flows as well.

Recent literature still investigates the relationship between foreign portfolio flows and local stock returns. Nonetheless, more factors are added into the analysis. Bekaert, Harvey, and Lumsdaine (2002) study the interrelationship between capital flows, returns, dividend yields, and world interest rates in 20 emerging markets. They find that lower interest rates contribute to increased capital flows. In addition, after the liberalization, the unexpected shocks

[2] *Positive-feedback trading means an investor buys stocks when prices move up and sells them when prices move down.*

to equity flows have strongly positive contemporaneous effect on returns. They also show that some of the effect is permanent.

Richards (2004) analyzes trading of foreign investors in six Asian emerging equity markets. The results show positive and significant impacts of both domestic and US returns on flows. Interestingly, shocks to US returns typically have larger effects than shocks in domestic returns. Contrast to the finding of Froot et al.'s (2001), positive price impact of innovations to flows on local returns is complete within few days. He states that the most logical explanation for price effect is due to demand shocks. If demand curve for stocks is downward sloping, foreign inflows represent an outward shift in the aggregate demand curve and should result in permanent higher prices.

Griffin, Nardari, and Stulz (2002) conduct an empirical test by using daily net equity flows into nine emerging markets. A joint test across markets from the Vector Autoregressive (VAR) analyses reveal that, in addition to domestic returns, both lagged North American and European returns are significant determinants of flows. They also find that a depreciation of local currencies leads to more foreign inflows.

In Thai stock market, Chai-anant (2003) researches the behavior of foreign investors on SET in the late 1990s and finds that a decrease in net purchases of foreign investors in the second half of 1996 contributed to a fall in stock prices. However, foreign net purchases helped mitigate the deep fall in stock prices in late 1997. Foreign investors reveal significant different trading behavior from other groups of investors. Specifically, they are positive-feedback traders. In addition, there is no evidence of market destabilization caused by foreign traders.

3. Data Description

THE data set is acquired from two sources. First, SET index and an amount of foreign investors' buy/sell transactions on a daily basis are obtained from the Stock Exchange of Thailand (SET). Second, the rest of data set that includes Baht/US$ exchange rate, 3-month US T-Bill rate, and international equity indices (Morgan Stanley Capital International (MSCI) equity indices) is obtained from Datastream.

The full sample covers data from January 3, 1995 to April 29, 2005. Due to the Asian crisis in 1997, time frame is separated into four sub-periods. First is the pre-crisis period (January 3, 1995 - April 30, 1997). Second is the crisis period (July 2, 1997-October 27, 1999). Third is the early post-crisis period (January 4, 2000 - April 26, 2002). Fourth is the late post-crisis period (January 2, 2003 - April 29, 2005). Thai currency was heavily attacked from May 1997 onward; therefore, April 1997 is set as the end of the first sub-period. The starting point of crisis period is July 2, 1997, the day Thai Baht was floated and, in turn, triggered the Asian crisis. The post-crisis period is also separated into two sub-periods because, from 2003, Thai economy had grown much more significantly compared to the early post-crisis period. In 2003, the economic growth was 6.7%, ranked second in the region to China. SET also showed stronger improvement relative to the early post-crisis period; for example, 2003's SET market capitalization grew by as much as 140% annually. In addition, restructuring process seemed to be more successful since the number of firms in rehabilitation group decreased substantially in 2004.

For the MSCI equity indices, World index is chosen to represent coverage from the major trading regions. Emerging markets and Asian indices are selected to examine the potential presence of a common impact within developing markets and Asian region respectively.

The analysis is performed on a daily, weekly, and monthly basis[3]. Moreover, Vector Autoregressive (VAR) method requires that all data series are stationary. Therefore, Augmented Dickey-Fuller (ADF) test is applied to perform the unit root tests and it is found that 3-month US T-Bill is I(1) whereas the rest are I(0), indicating they are, indeed, stationary. Here and subsequently, flow means net purchases (buy minus sell) of foreign investors scaled by previous period's market capitalization, and is shown in percentage term. Index returns and exchange rate returns are computed as $(\ln(P_t) - \ln(P_{t-1}))*100$. All series used in the VAR analyses are in US$ term basing on the perspective that an investor's position is unhedged against foreign currency.

Table 1 illustrates key statistics of local return and foreign equity flows. As mentioned earlier, mean value of flow is positive for the whole sampled period and is highest during the crisis. Nevertheless, it is negative in the early post-crisis period. SET performs quite well in the late post-crisis period since its mean return is positive whereas it is negative for other sub-periods. The standard deviations of both return and flow are highest in the crisis period. The correlation figures reveal that domestic return and foreign equity flows are more positively correlated on a weekly basis than on a daily basis. For autocorrelation, flow shows strong persistence for the whole and sub-periods at all frequencies. Nonetheless, the persistence is weak in the early post-crisis period. Daily SET index return is not much persistent and its autocorrelation is positively correlated at the first two lags for most of the time.

4. Empirical Design and Empirical Results

Empirical Design

The price impact of foreign equity flows

In order to investigate the price impact of foreign equity flows, the structural Vector Autoregressive (VAR) model, namely Model 1, is set up in the following way:

$$\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} a_f \\ a_r \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \begin{bmatrix} f_{t-1} \\ r_{t-1} \end{bmatrix} + \ldots + \begin{bmatrix} a_{1L} & a_{1L} \\ a_{2L} & a_{2L} \end{bmatrix} \begin{bmatrix} f_{t-L} \\ r_{t-L} \end{bmatrix} + \begin{bmatrix} 0 \\ a_c f_t \end{bmatrix} + \begin{bmatrix} \varepsilon_t^f \\ \varepsilon_t^r \end{bmatrix} \quad (1)$$

Or

$$\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} a_f \\ a_r \end{bmatrix} + \begin{bmatrix} a_{11}(L) & a_{12}(L) \\ a_{21}(L) & a_{22}(L) \end{bmatrix} \begin{bmatrix} f_{t-L} \\ r_{t-L} \end{bmatrix} + \begin{bmatrix} 0 \\ a_c f_t \end{bmatrix} + \begin{bmatrix} \varepsilon_t^f \\ \varepsilon_t^r \end{bmatrix} \quad (2)$$

Where f_t is the standardized net foreign equity flows at time t, and r_t is the time t return on SET index. Both are calculated in percentage term. The a(L)s are polynomials in the lag operator L, which contain the autoregressive coefficients. a_c is a contemporaneous impact of current flow on current return. ε_t^f and ε_t^f are white-noise disturbance terms that are assumed to be intertemporally uncorrelated.

This model is based on the assumptions about causality of flow and return. First, current flow depends on past flows and past returns. Second, current return is a function of past flows and past returns as well as current flow. This set up means that we are assuming that current flow affects current price with no reverse effect. This would be the case if market participants perceive current flow to contain information about value.

Akaike Information Criteria (AIC) is used to determine the appropriate lag length. The lowest value of AIC is selected. However, since degrees of freedom are not constrained, this study adopts six, four, and three lags for the estimations on a daily,

[3] *On a monthly basis, only full sample analysis is performed due to the limitation of number of observations.*

weekly, and monthly basis respectively.

Actually, the model will be estimated in the reduced form. Then, Choleski Decomposition is applied to identify the estimated coefficients in Model 1 from those of the reduced form[4].

The results from the Model 1 will be used to test against two main hypotheses. The first hypothesis is to test the contemporaneous price impact of flow on return. The second hypothesis is to test the impact of lagged flows on return.

The first hypothesis $H_o : a_c = 0$, $H_1 : a_c \neq 0$

The second hypothesis $H_o : a_{21}(L) = 0$, $H_1 : a_{21}(L) \neq 0$

In addition, I form impulse response functions in order to investigate the response of return to the innovations of flow[5].

The determinants of foreign equity flows

In order to examine the determinants of foreign equity flows, external factors, including international equity returns, exchange rate return, and international interest rates, are added as exogenous variables into the analysis[6]. Moreover, each international equity return is included in the VAR model separately to avoid multicollinearity problem. Then, structural Vector Autoregressive (VAR) model, namely Model 2, is set up in the following way:

$$\begin{bmatrix} r_t \\ f_t \end{bmatrix} = \begin{bmatrix} a_r \\ a_f \end{bmatrix} + \begin{bmatrix} a_{11}(L) & a_{12}(L) \\ a_{21}(L) & a_{22}(L) \end{bmatrix} \begin{bmatrix} r_{t-L} \\ f_{t-L} \end{bmatrix} + \begin{bmatrix} 0 \\ a_c r_t \end{bmatrix} + \begin{bmatrix} c_1(L)RR_{t-L} \\ c_1(L)RR_{t-L} \end{bmatrix} + \begin{bmatrix} d_1(L)FX_{t-L} \\ d_2(L)FX_{t-L} \end{bmatrix} + \begin{bmatrix} f_1(L)II_{t-L} \\ f_2(L)II_{t-L} \end{bmatrix} + \begin{bmatrix} \varepsilon_t^r \\ \varepsilon_t^f \end{bmatrix} \quad (3)$$

RR are international equity returns, namely MSCI World return, MSCI Emerging Markets return, and MSCI Asia ex Japan return. FX is Thai Baht/US$ return and II is the first difference of 3-month US T-bill rate.

This model is based on different assumptions about causality of flow and return as compared to Model 1. First, current return depends on past returns and past flows. Second, current flow is a function of past returns and past flows as well as current return. Since we would like to investigate the determinants of foreign equity flows, current return has to be included in flow equation to capture the possible feedback effect of return on flow.

The results from the Model 2 will be used to test additional three hypotheses, which test what external factors determine foreign equity flows.

The third hypothesis $H_o : c_2(L) = 0$, $H_1 : c_2(L) \neq 0$

The fourth hypothesis $H_o : d_2(L) = 0$, $H_1 : d_2(L) \neq 0$

The fifth hypothesis $H_o : f_2(L) = 0$, $H_1 : f_2(L) \neq 0$

Empirical Results

The price impact of foreign equity flows

The price movements following trading of foreign investors are reported in Panel A of table 2, which shows the results of return equation from the bivariate VAR of local return and foreign equity flows. Increased foreign equity flows lead to a strong increase in price in the same period. This is true for all frequencies. Sub-period analyses reveal that such contemporaneous effect is strongest in the crisis period and becomes weaker afterwards

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[4] *See details in the appendix A.*

[5] *See details in the appendix B.*

[6] *Exchange rate return and international interest rates will be used in the VAR model only on a monthly basis because those two are macroeconomic factors whic should not affect investment decision in very short run.*

(both on a daily and weekly basis). However, the impact of lagged flows on return is negative for most sub-periods and is less significant at daily frequency as compared to the other two frequencies. This result suggests that temporary inflows result in temporary price increases or price pressure effect exists. Moreover, from sub-period analyses, return has negative relationship with its first lag but it is weaker in terms of the significance on a weekly basis. This gives supportive evidence or price pressure effect.

Graphs from the impulse response function are presented in figure 1. The accumulated response of return to one standard deviation (S.D.) shocks of flow is positive. For example, for the entire sample period, a one S.D. shock in foreign equity flows increases market return by 1.25%. The IRF's graphs for sub-periods reveal that increase in domestic return caused by increased foreign net flows is strongest in the crisis period (both on a daily and weekly basis). Nevertheless, it does not mean that foreign investors destabilize Thai stock market because, during that time, local individual investors heavily sold shares whereas foreigners were net buyers. Thus, trading activity of foreign investors has more impact on market return.

In sum, the positive and significant accumulated response of return to the innovations in flow indicates that there exists permanent price change caused by foreign equity flows. If the innovation contains information, a positive innovation should lead to a permanent price increase. Thus, the permanent price increase leads me to conclude that foreign investors bring information into Thai stock market.

Panel B of table 2 shows the results of flow equation from the bivariate VAR of local return and foreign equity flows. Flow has significant positive relationship with the first lag of return on a daily basis. This could be an evidence of positive-feedback trading behavior. Nonetheless, it has not taken into account possible feedback effect of return on flow. In addition, the result is weaker on a weekly basis and turns to be negative on a monthly basis. Flow also has positive relationship with its lags, which indicates that it is persistent; this is true for all frequencies.

The determinants of foreign equity flows

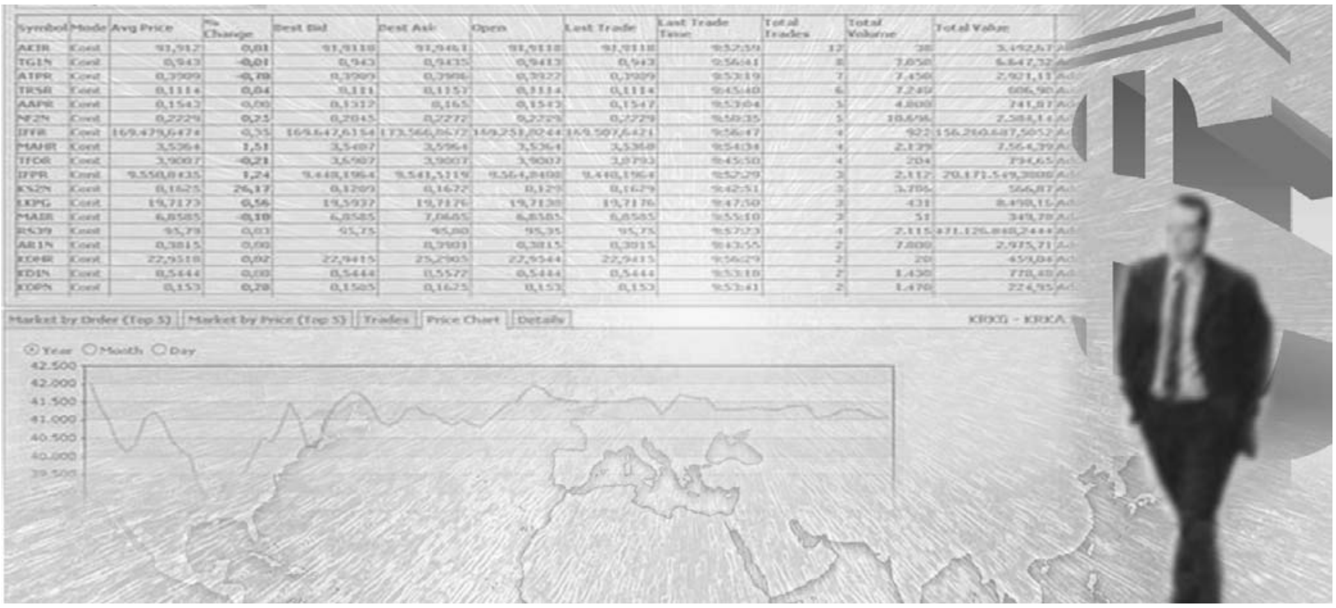
Panel A of table 3 shows that world return on the previous day predicts an increase in foreign equity flows. Interestingly, the impact of world return is larger than that of local return for most sub-periods and it is stronger through time. Specifically, in the late post-crisis period, a 1% increase in world return leads to a 0.0087% of market capitalization increase in foreign net flows to the Stock Exchange of Thailand (SET). However, the result turns to be insignificant at both weekly and monthly frequencies, which indicates that the relationship dissipates within one week.

Panel B of table 3 shows that the previous day's emerging markets return also predicts an increase in foreign equity flows even though its impact is less than that of domestic return. The result is weaker at weekly frequency but it turns to be significant again at monthly frequency, which may reflect portfolio rebalancing since most investment in emerging markets is via mandates to managers that only invest in these markets.

Panel C of table 3 reveals a significant negative relationship between the first lagged Asian regional return, namely Asia ex Japan return, and foreign equity flows at daily frequency for both the entire sample and the crisis periods. This may imply that foreigners are positive-feedback traders with respect to Asian regional return and rebalance their regional portfolios very quickly since the relationship is insignificant in both weekly and monthly frequencies.

After adding two macroeconomic variables into a monthly basis's analysis, the results from table 4 reveal that international interest rates, namely the first difference of 3-month US T-bill rate, has no significant impact on foreign equity flows[7]. This

[7] *The result does not change even using level of 3-month US T-bill rate instead of its first difference.*



contrasts to the findings in the early literatures such as Chuhan et al. (1998). It might be the case that there are various alternative investments nowadays compared to in 1980s. Thus, when interest rates are relatively low in foreign countries, there is no need for foreign investors to shift their wealth into external equity markets, seeking for higher returns outside their home countries. Interestingly, exchange rate return (Thai Baht/US$) also has no significant impact on foreign equity flows. One possible reason is that currency risk can be diversified away in a well-diversified international portfolio.

One point worth mentioning is that local return still significantly determines flows although external factors are included into the analysis. Specifically, foreign investors exhibit positive-feedback trading behavior with respect to domestic return on a daily basis since its first lag still significantly determines foreign equity flows after controlling for current local return. The magnitude and significance of the estimated coefficients of local return do not change much. In sum, returns in both domestic market and external markets are important in explaining foreign equity flows in Thai stock market.

5. Conclusion

THIS study investigates the impact of foreign equity flows on Thai stock market and their determinants over the period of January 1995 - April 2005. This study finds substantial and permanent price movements associated with the trades of foreign investors at all frequencies (daily, weekly, and monthly), which could imply that they bring information into Thai stock market. Moreover, foreign investors are positive-feedback traders with respect to domestic return on a daily basis and this behavior does not change in any sub-periods.

In addition to local return, external factors, which are international equity returns, also determine foreign equity flows significantly at daily frequency. Specifically, world return has the strongest impact on foreign equity flows compared to emerging markets return and Asian return. It might be the case that foreign investors use recent returns to extract information concerning future returns or sentiment-driven trading, or the combination of both. However, two macroeconomic factors, which are exchange rate return and international interest rates, do not have any significant impact on foreign equity flows.

APPENDIX A: CHOLESKI DECOMPOSITION

In a reduced form of VAR, variables are explained in terms of their own lags and lags of other variables and the error terms are also white-noise disturbances but they are allowed to correlate across equations. As long as each equation has identical parameters to be estimated, equations in the VAR can be estimated using OLS with consistent and asymptotically efficient estimators.

However, to capture the contemporaneous effects between variables, we have to impose some restrictions in order to exactly identify the model by using Choleski Decomposition. It imposes restrictions on the matrix that captures contemporaneous or feedback effects between endogenous variables in a lower tri-angular fashion.

The structural VAR model (assuming there is feedback effect of flow on return) can be presented by

$$\begin{bmatrix} 1 & 0 \\ -a_c & 1 \end{bmatrix}\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} a_f \\ a_r \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}\begin{bmatrix} f_{t-1} \\ r_{t-1} \end{bmatrix} + \ldots +$$
$$\begin{bmatrix} a_{1L} & a_{1L} \\ a_{2L} & a_{2L} \end{bmatrix}\begin{bmatrix} f_{t-L} \\ r_{t-L} \end{bmatrix} + \begin{bmatrix} \varepsilon_t^f \\ \varepsilon_t^r \end{bmatrix}$$

Define A = $\begin{bmatrix} 1 & 0 \\ -a_c & 1 \end{bmatrix}$

Then multiplying every term by A^{-1}, we obtain the reduced form or the unrestricted VAR, which is shown as follow:

$$\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} b_f \\ b_r \end{bmatrix} + \begin{bmatrix} b_{11}(L) & b_{12}(L) \\ b_{21}(L) & b_{22}(L) \end{bmatrix}\begin{bmatrix} f_{t-L} \\ r_{t-L} \end{bmatrix} + \begin{bmatrix} e_t^f \\ e_t^r \end{bmatrix}$$

Where $\begin{bmatrix} e_t^f \\ e_t^r \end{bmatrix} = \left[\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \mathrm{var}(e_t^f) & \mathrm{cov}(e_t^f, e_t^r) \\ \mathrm{cov}(e_t^r, e_t^f) & \mathrm{var}(e_t^r) \end{bmatrix}\right]$

After that, we can recover parameters of structural VAR.

APPENDIX B: IMPULSE RESPONSE FUNCTION

The reduced form of VAR model shown in the appendix A can be written as a vector moving average (VMA) with variables expressed in terms of current and past values of the residuals. It is shown as follow:

$$\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} \bar{f}_t \\ \bar{r}_t \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}^i \begin{bmatrix} e_{t-i}^f \\ e_{t-i}^r \end{bmatrix}$$

Since $\begin{bmatrix} e_{t-i}^f \\ e_{t-i}^r \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ -a_c & 1 \end{bmatrix}^{-1}\begin{bmatrix} \varepsilon_{t-i}^f \\ \varepsilon_{t-i}^r \end{bmatrix}$,

then $\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} \bar{f}_t \\ \bar{r}_t \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}^i \begin{bmatrix} 1 & 0 \\ -a_c & 1 \end{bmatrix}^{-1}\begin{bmatrix} \varepsilon_{t-i}^f \\ \varepsilon_{t-i}^r \end{bmatrix}$

Define A = $\begin{bmatrix} 1 & 0 \\ -a_c & 1 \end{bmatrix}$, $B = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$, and let $\phi_i = B_i A^{-1}$

$$\begin{bmatrix} f_t \\ r_t \end{bmatrix} = \begin{bmatrix} \bar{f}_t \\ \bar{r}_t \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} \phi_{11}(i) & \phi_{12}(i) \\ \phi_{21}(i) & \phi_{22}(i) \end{bmatrix}\begin{bmatrix} \varepsilon_{t-i}^f \\ \varepsilon_{t-i}^r \end{bmatrix}$$

Or, more compactly,

$$X_t = \mu = \sum_{i=0}^{\infty} \phi_i \varepsilon_{t-i}$$

The four sets of coefficients $\phi_{11}(i), \phi_{12}(i), \phi_{21}(i)$, and $\phi_{22}(i)$ are called impulse response functions. The accumulated effects of unit impulses in ε_t^f can be obtained from appropriate summation of the coefficients of impulse response functions. Note that, after n periods, the effect of ε_t^f on the value of r_{t+n} is $\phi_{21}(n)$. Thus, after n periods, the cumulated sum of the effects of ε_t^f on the (r_t) sequence is $\sum_{i=0}^{n} \phi_{21}(i)$.

Table 1: Investment Statistics

This table provides key investment statistics including correlation and autocorrelation for full sampled period, and four sub-periods on a daily, weekly, and monthly basis. Return means US$ SET index return. Flow means US$ foreign net purchases scaled by previous period's US$ market capitalization. All series are presented in a percentage term.

	Full sample Jan. 95 - Apr. 05			Pre-crisis Jan. 95 - Apr. 97		Crisis Jul. 97 - Oct. 99		Early post-crisis Jan. 00 - Apr. 02		Late post-crisis Jan. 03 - Apr. 05	
	Daily	Weekly	Monthly	Daily	Weekly	Daily	Weekly	Daily	Weekly	Daily	Weekly
Return											
Mean	-0.0464	-0.2173	-0.9491	-0.1333	-0.6281	-0.1285	-0.6022	-0.0678	-0.3687	0.1239	0.5873
Median	-0.0733	-0.2576	-0.6814	-0.1594	-0.7236	-0.3868	-1.2998	-0.1324	-0.3795	0.1186	0.8282
Max	14.8200	40.4171	34.0026	4.7600	8.6651	14.8200	40.4171	5.7322	12.5538	5.7898	10.0171
Min	-14.0712	-18.7621	-35.1625	-6.2398	-12.7929	-14.0712	-18.7621	-7.6551	-17.2613	-6.1137	-6.3837
S.D.	2.0898	5.2775	11.8659	1.3598	3.4560	3.2812	8.5404	1.8540	4.5173	1.4302	3.3814
Flow											
Mean	0.0024	0.0136	0.0583	0.0035	0.0180	0.0079	0.0404	-0.0021	-0.0085	0.0019	0.0107
Median	-0.0004	-0.0025	-0.0265	0.0012	0.0119	0.0015	0.0123	-0.0042	-0.0222	0.0009	-0.0045
Max	0.2531	0.6220	1.2676	0.1491	0.2904	0.2531	0.6220	0.1335	0.2646	0.1417	0.4802
Min	-0.2878	-0.3836	-0.6221	-0.2006	-0.3520	-0.0999	-0.1800	-0.2878	-0.3836	-0.1226	-0.3824
S.D.	0.0323	0.1153	0.3535	0.0270	0.0972	0.0380	0.1397	0.0276	0.0911	0.0359	0.1308
No. of obs. (daily)	2534			571		571		571		571	
No. of obs. (weekly)	538			121		121		121		121	
No. of obs. (monthly)	124										
Correlation between return & flow	0.350	0.526	0.472	0.448	0.644	0.372	0.551	0.304	0.563	0.406	0.596
Autocorrelation											
Return Lag 1	0.156	0.034	0.074	0.159	-0.066	0.205	-0.003	0.043	0.063	0.089	0.117
Lag 2	0.034	0.135	0.139	0.110	-0.047	-0.002	0.187	0.088	0.103	0.011	0.111
Lag 3	-0.010	0.042	-0.038	-0.020	-0.027	-0.023	0.089	0.015	-0.047	-0.050	-0.055
Lag 4	0.011	0.015		-0.101	0.018	0.006	0.043	0.039	-0.160	0.000	0.002
Lag 5	-0.005			-0.062		-0.037		0.002		0.094	
Lag 6	-0.014			-0.005		-0.021		-0.017		0.070	
Flow Lag 1	0.554	0.458	0.329	0.609	0.442	0.549	0.448	0.447	0.269	0.585	0.448
Lag 2	0.362	0.316	0.207	0.367	0.323	0.342	0.330	0.262	0.199	0.403	0.307
Lag 3	0.274	0.209	0.073	0.287	0.224	0.246	0.240	0.210	0.096	0.274	0.201
Lag 4	0.248	0.080		0.199	0.229	0.232	0.065	0.153	-0.084	0.269	0.054
Lag 5	0.225			0.215		0.222		0.085		0.245	
Lag 6	0.235			0.299		0.210		0.103		0.260	

Table 2: Bivariate VAR of Return and Flow

This table shows the results from structural bivariate Vector Autoregressive (VAR) with six, four, and three lags on a daily, weekly, and monthly basis respectively. However, only the first three are reported. Return means US$ SET index return. Flow means US$ foreign net purchases scaled by previous period's US$ market capitalization. Both are expressed in a percentage term. The ordering of the variables in VAR runs from flow to return. Panel A reports the return equation results. Panel B reports the flow equation results.

Panel A	Daily					Weekly					Monthly
	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample
Variables	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05
Intercept	**-0.0759***	**-0.2224*****	**-0.2773****	-0.0276	0.0883	-0.2645	**-1.0708*****	-0.6358	-0.2223	0.2360	-0.7634
t-stat	**-1.94**	**-3.95**	**-2.01**	-0.38	1.63	-1.40	**-3.54**	-0.93	-0.64	0.95	-0.83
Return											
Lag 1	0.0165	**-0.1194*****	**0.0791***	**-0.0740***	**-0.1570*****	-0.0098	**-0.3536*****	**-0.0707***	-0.0050	**0.1836***	**0.2358****
t-stat	0.79	**-2.60**	**1.79**	**-1.66**	**-3.54**	-0.23	**-3.64**	**-0.76**	-0.05	**1.92**	**2.50**
Lag 2	0.0251	0.0562	-0.0200	**0.0999****	0.0294	**0.1662*****	0.0192	**0.1711****	0.0125	0.1406	**0.1808***
t-stat	1.20	1.22	-0.45	**2.24**	0.65	**3.86**	0.18	**1.87**	0.13	1.45	**1.90**
Lag 3	0.0003	-0.0092	-0.0146	-0.0007	0.0293	**0.1554*****	0.1124	0.2429	-0.0711	0.0214	0.0351
t-stat	0.01	-0.20	-0.33	-0.02	0.65	**3.59**	1.14	2.63	-0.76	0.22	0.37
Flow											
Lag 0	**27.1876*****	**31.6412*****	**36.7181*****	**21.5543*****	**23.5594*****	**30.7903*****	**32.8678*****	**48.4012*****	**27.879*****	**19.7967*****	**21.1743*****
t-stat	**17.71**	**12.26**	**8.13**	**6.86**	**11.87**	**16.53**	**11.49**	**8.89**	**6.92**	**9.42**	**7.62**
Lag 1	**-3.7397****	**-6.0306****	-4.7890	1.4702	-0.0312	**-7.5885*****	1.3424	-7.8016	-2.5172	**-7.4749****	**-9.9758*****
t-stat	**-2.16**	**-1.99**	-0.93	0.43	-0.01	**-3.18**	0.32	-1.07	-0.52	**-2.55**	**-2.77**
Lag 2	**-5.9929*****	-1.7103	-3.5607	**-6.2524***	**-6.6427*****	-2.4845	**-7.6472***	0.9221	1.4420	-0.3247	-1.0984
t-stat	**-3.45**	-0.56	-0.69	**-1.83**	**-2.83**	-1.03	**-1.74**	0.13	0.29	-0.11	-0.30
Lag 3	-1.9700	**-6.6377****	-3.2632	-1.0351	-2.4196	**-6.5544*****	**-6.6141***	-10.7665	-0.9166	-3.0935	**-6.4342***
t-stat	-1.13	**-2.18**	-0.64	-0.30	-1.03	**-2.77**	**-1.73**	-1.48	-0.19	-1.04	**-1.89**
Adj. R^2	0.1365	0.2503	0.1413	0.0902	0.2269	0.3575	0.5419	0.4448	0.2993	0.4412	0.3470

*,**,*** Significance at 10%, 5%, 1%

Panel B	Daily					Weekly					Monthly
	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample	Pre crisis	Crisis	Early post-crisis	Late post-crisis	Full sample
Variables	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05
Intercept	0.0008	**0.0024****	0.0017	-0.0007	0.0006	0.0038	-0.0029	0.0043	-0.0045	0.0115	0.0218
t-stat	1.49	**2.57**	1.28	-0.71	0.53	0.85	-0.28	0.36	-0.54	1.01	0.70
Return											
Lag 1	**0.0040*****	**0.0066*****	**0.0028*****	**0.0044*****	**0.0069*****	-0.0006	0.0026	-0.0015	0.0028	-0.0052	**-0.0068****
t-stat	**15.52**	**9.45**	**6.87**	**7.58**	**7.66**	-0.63	0.81	-0.91	1.22	-1.20	**-2.19**
Lag 2	**-0.0012*****	0.0010	**-0.0012*****	0.0001	**-0.0030*****	**-0.0028*****	**-0.0099*****	-0.0019	0.0018	-0.0053	-0.0047
t-stat	**-4.24**	1.29	**-2.77**	0.21	**-3.12**	**-2.78**	**-2.92**	-1.16	0.78	-1.21	-1.49
Lag 3	-0.0003	0.0007	-0.0002	0.0007	**-0.0023****	**-0.0029*****	**-0.0058***	-0.0022	-0.0007	-0.0048	0.0011
t-stat	-1.08	0.98	-0.48	1.18	**-2.42**	**-2.84**	**-1.76**	-1.38	-0.30	-1.09	0.34
Flow											
Lag 1	**0.3977*****	**0.3769*****	**0.4179*****	**0.3145*****	**0.3929*****	**0.3799*****	0.2322	**0.4047*****	0.1486	**0.4319*****	**0.4066*****
t-stat	**18.87**	**7.96**	**9.30**	**7.10**	**8.30**	**7.12**	1.65	**3.29**	1.29	**3.39**	**3.53**
Lag 2	**0.0681*****	-0.0545	0.0247	0.0284	**0.1553*****	**0.2122*****	**0.5242*****	**0.2195***	0.1236	0.1959	0.1718
t-stat	**3.03**	-1.09	0.51	0.61	**3.11**	**3.80**	**3.76**	**1.73**	1.05	1.43	1.40
Lag 3	**0.0585*****	**0.0968***	0.0725	0.0714	0.0291	**0.1161****	0.0845	0.1629	0.0628	0.1342	-0.0939
t-stat	**2.59**	**1.93**	1.51	1.54	0.58	**2.10**	0.66	1.28	0.54	0.99	-0.82
Adj. R^2	0.3897	0.4823	0.3806	0.2828	0.4380	0.2481	0.2610	0.2355	0.0671	0.2137	0.1532

*,**,*** Significance at 10%, 5%, 1%

Table 3: Flow with International Equity Returns

This table presents the results from structural bivariate Vector Autoregressive (VAR) with exogenous variables, with six, four, and three lags on a daily, weekly, and monthly basis respectively. However, only the first three are reported. World return is computed from MSCI World index. EM return and Asian regional return are computed from the MSCI Emerging Markets, and the MSCI Asia ex Japan indices respectively. The ordering of variables in VAR runs from return to flow. The models with World, EM, and Asia ex Japan returns are shown in Panel A, Panel B, and Panel C respectively.

Panel A	Daily					Weekly					Monthly
	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample
Variables	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05
Intercept	**0.0008***	**0.0036*****	**0.0022***	-0.0005	-0.0004	0.0045	0.0102	0.0048	-0.0037	-0.0001	0.0110
t-stat	**1.80**	**4.22**	**1.78**	-0.50	-0.40	1.24	1.30	0.51	-0.51	-0.01	0.44
Return											
Lag 0	**0.0037*****	**0.0069*****	**0.0027*****	**0.0033*****	**0.0078*****	**0.0111*****	**0.0168*****	**0.0088*****	**0.0113*****	**0.0225*****	**0.0172*****
t-stat	**16.16**	**12.42**	**7.27**	**6.10**	**10.92**	**16.30**	**11.33**	**8.73**	**6.78**	**8.88**	**8.29**
Lag 1	**0.0033*****	**0.0062*****	**0.0021*****	**0.0041*****	**0.0062*****	-0.0004	**0.0060*****	-0.0003	0.0034	**-0.0075****	**-0.0086*****
t-stat	**13.40**	**9.79**	**5.35**	**7.39**	**7.72**	-0.51	**2.63**	-0.19	1.62	**-2.18**	**-3.05**
Lag 2	**-0.0010*****	0.0008	**-0.0009****	-0.0001	**-0.0022*****	**-0.0040*****	**-0.0044***	**-0.0037*****	0.0026	**-0.0065***	**-0.0095*****
t-stat	**-4.05**	1.12	**-2.24**	-0.13	**-2.66**	**-4.71**	**-1.88**	**-2.78**	1.22	**-1.85**	**-3.25**
Lag 3	-0.0003	0.0005	-0.0001	0.0006	**-0.0021****	**-0.0040*****	**-0.0065*****	**-0.0038*****	0.0011	-0.0039	0.0005
t-stat	-1.10	0.76	-0.13	0.96	**-2.51**	**-4.66**	**-2.81**	**-2.76**	0.53	-1.10	0.15
Flow											
Lag 1	**0.3904*****	**0.3288*****	**0.3978*****	**0.3049*****	**0.3464*****	**0.3286*****	0.0972	**0.2926*****	0.1004	**0.3997*****	**0.3779*****
t-stat	**19.56**	**7.75**	**9.27**	**7.09**	**8.01**	**7.54**	1.01	**3.02**	1.03	**4.11**	**3.97**
Lag 2	**0.0797*****	-0.0179	0.0281	0.0545	**0.1788*****	**0.1658*****	**0.3750*****	0.1158	0.0489	0.1183	0.1472
t-stat	**3.72**	-0.40	0.61	1.21	**3.93**	**3.65**	**3.96**	1.16	0.49	1.14	1.51
Lag 3	**0.0560*****	**0.1185*****	0.0645	0.0716	0.0366	**0.1498*****	**0.1843****	**0.1825***	0.0451	0.1470	0.0483
t-stat	**2.61**	**2.64**	1.40	1.59	0.80	**3.34**	**2.12**	**1.87**	0.46	1.42	0.52

Panel A	Daily					Weekly					Monthly
	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample
Variables	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05
World											
Lag 1	0.0056***	0.0015	0.0044***	0.0048***	0.0087***	0.0010	0.0078*	0.0011	-0.0040	0.0026	0.0070
t-stat	10.06	0.99	3.38	4.71	6.04	0.61	1.75	0.27	-1.20	0.49	1.06
Lag 2	-0.0035***	-0.0059***	-0.0028**	-0.0030***	-0.0051***	0.0019	-0.0038	0.0088**	-0.0050	0.0004	0.0197***
t-stat	-6.16	-3.76	-2.08	-2.91	-3.47	1.09	-0.86	2.21	-1.51	0.07	2.89
Lag 3	0.0006	-0.0013	0.0003	0.0009	-0.0017	0.0030*	0.0065	0.0033	-0.0029	0.0034	0.0028
t-stat	1.11	-0.83	0.24	0.85	-1.16	1.72	1.48	0.81	-0.86	0.65	0.41
Adj. R^2	0.4827	0.6020	0.4540	0.3648	0.5844	0.5047	0.6753	0.5607	0.3497	0.5519	0.4753

*,**,*** Significance at 10%, 5%, 1%

Panel B	Daily					Weekly					Monthly
	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample
Variables	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05
Intercept	0.0010**	0.0033***	0.0022*	-0.0006	-0.0004	0.0051	0.015**	0.0080	-0.0019	0.0003	0.0169
t-stat	2.06	4.05	1.80	-0.66	-0.43	1.41	2.14	0.86	-0.28	0.04	0.68
Return											
Lag 0	0.0040***	0.0066***	0.0029***	0.0036***	0.0085***	0.0111***	0.0166***	0.0084***	0.0117***	0.0227***	0.0162***
t-stat	17.18	11.87	7.71	6.71	11.59	16.35	11.15	8.13	7.08	9.08	7.74
Lag 1	0.0034***	0.0058***	0.0023***	0.0043***	0.0058***	-0.0004	0.0066***	0.0003	0.0032	-0.0080**	-0.0117***
t-stat	12.56	8.99	5.38	7.13	6.64	-0.43	2.99	0.18	1.53	-2.24	-3.87
Lag 2	-0.0007***	0.0004	-0.0006	0.0004	-0.0021**	-0.0042***	-0.0041*	-0.0040***	0.0027	-0.0064*	-0.0096***
t-stat	-2.65	0.59	-1.33	0.68	-2.30	-4.55	-1.75	-2.67	1.28	-1.76	-3.02
Lag 3	-0.0004	0.0003	0.0000	0.0005	-0.0022**	-0.0041***	-0.0058**	-0.0036**	0.0009	-0.0037	0.0005
t-stat	-1.28	0.38	0.09	0.86	-2.37	-4.37	-2.54	-2.31	0.42	-1.00	0.14
Flow											
Lag 1	0.3687***	0.3345***	0.3869***	0.2865***	0.2980***	0.3316***	0.0219	0.3143***	0.1492	0.3907***	0.3919***
t-stat	18.41	7.91	9.03	6.61	6.83	7.55	0.22	3.27	1.53	3.92	4.12
Lag 2	0.0913***	-0.0323	0.0325	0.0526	0.2148***	0.1636***	0.3516***	0.1296	0.0490	0.1113	0.1704*
t-stat	4.28	-0.72	0.71	1.16	4.70	3.58	3.66	1.30	0.49	1.06	1.71
Lag 3	0.0519**	0.1143**	0.0689	0.0545	0.0356	0.1479***	0.1905**	0.1666*	0.0684	0.1433	0.0479
t-stat	2.43	2.56	1.51	1.20	0.77	3.27	2.10	1.69	0.70	1.37	0.50
EM											
Lag 1	0.0015***	0.0013	0.0009	0.0013	0.0039***	0.0004	0.0066*	-0.0010	-0.0056**	0.0034	0.0101**
t-stat	2.83	1.08	0.86	1.28	2.79	0.28	1.96	-0.34	-2.12	0.72	2.16
Lag 2	-0.0022***	-0.0002	-0.0019*	-0.0026***	-0.0026*	0.0018	0.0001	0.0048*	-0.0017	0.0002	0.0078
t-stat	-4.06	-0.17	-1.82	-2.58	-1.85	1.20	0.02	1.69	-0.62	0.05	1.65
Lag 3	0.0008	0.0030**	-0.0004	0.0014	-0.0004	0.0013	0.0041	0.0001	-0.0026	0.0023	-0.0033
t-stat	1.44	2.48	-0.36	1.34	-0.26	0.90	1.39	0.02	-0.96	0.51	-0.70
Adj. R^2	0.4612	0.5956	0.4480	0.3470	0.5572	0.5037	0.6740	0.5536	0.3635	0.5548	0.4622

*,**,*** Significance at 10%, 5%, 1%

Panel C	Daily					Weekly					Monthly
	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample	Pre-crisis	Crisis	Early post-crisis	Late post-crisis	Full sample
Variables	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05	Jan. 95 - Apr. 05
Intercept	**0.0010****	**0.0035*****	**0.0022***	-0.0007	-0.0003	0.0053	**0.0161****	0.0065	-0.0020	0.0010	0.0209
t-stat	**2.08**	**4.24**	**1.84**	-0.77	-0.33	1.47	**2.17**	0.72	-0.29	0.11	0.82
Return											
Lag 0	**0.0041*****	**0.0068*****	**0.0030*****	**0.0037*****	**0.0086*****	**0.0110*****	**0.0160*****	**0.0084*****	**0.0113*****	**0.0229*****	**0.0159*****
t-stat	**17.78**	**12.26**	**8.24**	**6.91**	**11.75**	**16.39**	**10.43**	**8.57**	**6.99**	**9.22**	**7.34**
Lag 1	**0.0039*****	**0.0060*****	**0.0031*****	**0.0045*****	**0.0065*****	-0.0001	**0.0070*****	-0.0002	**0.0039***	**-0.0086****	**-0.0107*****
t-stat	**13.90**	**8.56**	**6.62**	**7.51**	**7.28**	-0.11	**2.93**	-0.14	**1.81**	**-2.37**	**-3.04**
Lag 2	**-0.0008*****	0.0010	-0.0007	0.0002	**-0.0024*****	**-0.0046*****	**-0.0046***	**-0.0054*****	0.0025	**-0.0063***	**-0.0097*****
t-stat	**-2.65**	1.29	-1.41	0.29	**-2.60**	**-4.54**	**-1.85**	**-3.14**	1.15	**-1.72**	**-2.69**
Lag 3	-0.0003	0.0010	-0.0001	0.0007	**-0.0024*****	**-0.0041*****	**-0.0057****	**-0.0050*****	0.0017	-0.0025	-0.0008
t-stat	-1.05	1.34	-0.27	1.16	**-2.61**	**-4.01**	**-2.25**	**-2.82**	0.78	-0.66	-0.20
Flow											
Lag 1	**0.3751*****	**0.3261*****	**0.4084*****	**0.2829*****	**0.3055*****	**0.3372*****	0.0943	**0.3100*****	0.1404	**0.3817*****	**0.4079*****
t-stat	**18.55**	**7.41**	**9.39**	**6.53**	**6.94**	**7.74**	0.95	**3.25**	1.44	**3.86**	**4.27**
Lag 2	**0.0871*****	-0.0129	0.0211	0.0460	**0.1941*****	**0.1671*****	**0.3796*****	0.1482	0.0400	0.1068	0.1479
t-stat	**4.02**	-0.28	0.45	1.02	**4.18**	**3.67**	**3.91**	1.52	0.40	1.02	1.44
Lag 3	**0.0512****	**0.1329*****	0.0719	0.0646	0.0347	**0.1411*****	**0.1505***	**0.1653***	0.0704	0.1688	0.0568
t-stat	2.36	**2.85**	1.55	1.43	0.74	**3.13**	**1.68**	**1.69**	0.72	1.62	0.58
Asia ex Japan											
Lag 1	**-0.0011****	0.0007	**-0.0025*****	-0.0006	0.0012	-0.0002	0.0007	0.0004	**-0.0053****	0.0044	0.0053
t-stat	**-2.46**	0.57	**-3.05**	-0.76	1.01	-0.16	0.19	0.18	**-2.13**	1.00	0.97
Lag 2	**-0.0010****	-0.0020	-0.0002	-0.0010	-0.0010	0.0021	-0.0020	**0.0056****	-0.0012	0.0008	0.0068
t-stat	**-2.18**	-1.52	-0.21	-1.20	-0.82	1.53	-0.64	**2.27**	-0.49	0.19	1.24
Lag 3	0.0004	-0.0014	-0.0002	0.0001	0.0010	0.0011	0.0030	0.0029	-0.0031	-0.0021	0.0003
t-stat	0.78	-1.11	-0.22	0.07	0.82	0.76	0.96	1.15	-1.21	-0.51	0.06
Adj. R^2	0.4594	0.5919	0.4522	0.3406	0.5506	0.5075	0.6650	0.5752	0.3627	0.5570	0.4348

*,**,*** Significance at 10%, 5%, 1%

Table 4: Flow with International Equity Returns and Macro Economic Variables

This table shows the results from structural bivariate Vector Autoregressive (VAR) with exogenous variables, with three lags on a monthly basis. FX means Thai Baht/US$ exchange rate return. II means the first difference of 3-month US T-bill rate. Both are expressed in a percentage term. The ordering of the variables in VAR runs from return to flow. Only exogenous variables' coefficients are reported.

	Monthly Full sample (Jan. 95 - Apr. 05)		
Variables	World	EM	Asia ex Japan
RR			
Lag 1	0.0064	**0.0099****	0.0042
t-stat	0.92	**2.04**	0.72
Lag 2	**0.0224*****	**0.0101***	0.0095
t-stat	**3.14**	**1.96**	1.54
Lag 3	0.0045	-0.0035	0.0002
t-stat	0.59	-0.63	0.04
FX			
Lag 1	-0.0083	-0.0099	-0.0088
t-stat	-1.05	-1.19	-1.01
Lag 2	0.0020	0.0059	0.0044
t-stat	0.25	0.70	0.49
Lag 3	0.0026	0.0003	0.0013
t-stat	0.35	0.04	0.16
II			
Lag 1	-0.1933	-0.1083	-0.1243
t-stat	-1.23	-0.67	-0.78
Lag 2	0.1013	0.1100	0.1173
t-stat	0.65	0.70	0.72
Lag 3	0.0015	0.0211	0.0277
t-stat	0.01	0.14	0.18
Adj. R^2	0.4611	0.4456	0.4142

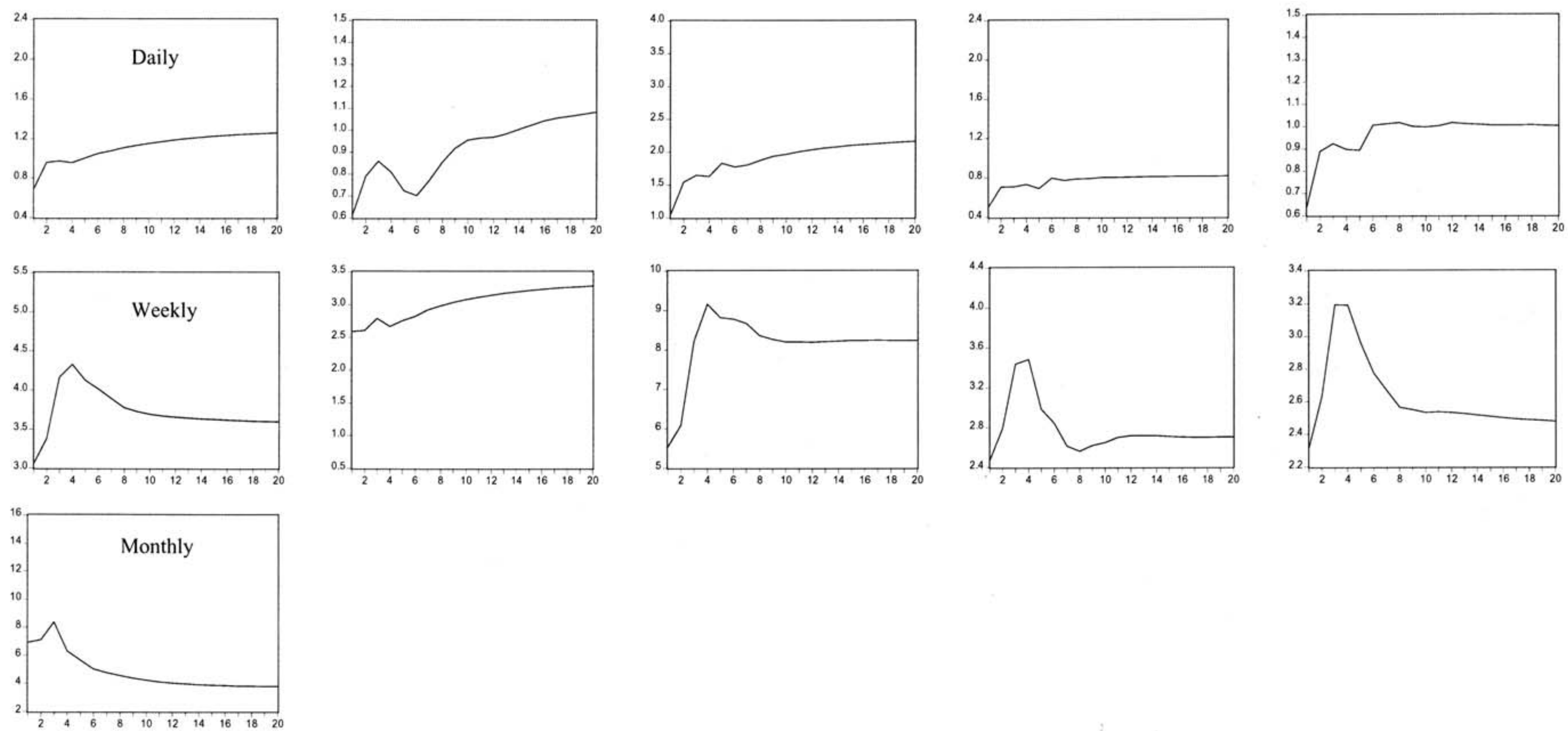
*,**,*** Significance at 10%, 5%, 1%

Figure 1: Accumulated Impulse Response Functions

The figures below are accumulative responses plotted from the structural bivariate VAR for full sampled period, and four sub-periods. The ordering of the variables in VAR runs from flow to return. Y-axis is the response of return to one standard deviation shock of flow. X-axis is the number of periods.

Accumulated Response of Return to Choleski One S.D. Innovations in Flow

Full Sample	Pre - Crisis	Crisis	Early Post - Crisis	Late Post - Crisis
Jan. 95 - Apr. 05	Jan. 95 - Apr. 97	Jul. 97 - Oct. 99	Jan. 00 - Apr. 02	Jan. 03 - Apr. 05



REFERENCES:

Bekaert, G., and Harvey, C.R. (1998). Capital flows and the behavior of emerging market equity returns. *NBER working paper series.*

Bekaert, G., Harvey, C.R., and Lumsdaine, R.L. (2002). The dynamics of emerging markets equity flows. *Journal of International Money and Finance,* 21, 295 - 350.

Chai-anant C. (2003). Friends or foes? Foreign investors in the Thai stock market during 1994-1998. *Bank of Thailand discussion paper,* 2003.

Choe H., Kho B. C., and R. Stulz (1999). Do foreign investors destabilize stock markets? The Korean experience in 1997. *NBER working paper series.*

Chuhan P., S. Claessens, and N. Mamingi (1998). Equity and bond flows to Latin America and Asia: The role of global and country factors. *Journal of Development Economics,* 55, 439-463.

Enders, W. (2003). *Applied econometric time series.* New York: John Wiley & Son. Inc.

Fernandez-Arias, E. (1996). The new wave of private capital inflows: Push or pull? *Journal of Development Economics,* 48, 389 - 418.

Froot K., O'Connell P., and M. Seasholes (2001). The portfolio flows of international investors. *Journal of Financial Economics,* 59, 151 -193.

Griffin J. M., F. Nardari, and R. M. Stulz (2002). Daily Cross-Border Equity Flows: Pushed or Pulled ?. *NBER working paper series.*

Karolyi A. (1999). Did the Asian financial crisis scare foreign investors out of Japan? *Working paper,* Fisher College of Business: Ohio State University.

Richards A. (2004). Big Fish in Small Ponds: The Trading Behaviour and Price Impact of Foreign Investors in Asian Emerging Equity Markets. *Research Discussion Paper,* Reserve Bank of Australia.

Taylor, M.P., and Sarno (1997). Capital flows to developing countries: Long- and short-term determinants. *The World Bank Economic Review,* 11, 451 - 470.