THE RELATION BETWEEN FOREIGN INVESTORS' TRADING
AND STOCK RETURNS (A CASE OF THAILAND)

Dr. Lugkana Worasinchai, DBA

College of Business, Bangkok University

ABSTRACT

The objective of this study is to investigate bivariate-causal relationship between foreign portfolio flows and stock returns of the Stock Exchange of Thailand. The study employs the Granger-causality test to analyze the presence and direction of causality between the two variables from 1995 to 2000. The result indicates that there is a uni-directional relationship from stock returns to foreign portfolio flows before and during the Asian financial crisis. The finding implied that ups and downs of the Thai stock market affected the net purchases of foreign investors. The results also showed no causality relationship from foreign portfolio flows to stock returns. It implied that foreign investors in the Thai stock market did not stimulate stock prices.

INTRODUCTION

68

The general belief that foreign investors fuel the Thai stock market and the bull-bear market leads foreign investors has been discussed among investors in the Stock Exchange of Thailand. Puzzling to researchers is the fact that foreign investors were not the majority shareholders in the Stock Exchange of Thailand. Researchers and practitioners attempt to explain the day to day movements and volatility of the Thai stock market by considering daily net purchases of foreign investors. The purpose of this study is to prove foreign investors' roles in the Thai stock market rather than simply assumed.

In the 1990s, international investors recognized emerging markets as a special category. Foreign investors poured money and rushed into emerging markets to take the benefits of high returns. Foreign investors were blamed in the market meltdown in 1997 because generally foreign investors immediately withdrew money from one country in order to search for better returns in different countries. Researchers, academicians, and

policy makers alike are in wide discussion of the danger of foreign portfolio flows and foreign speculators. In contrast, Barth and Zhang (1999) argued that foreign investors are only relatively small percentage in emerging markets, and their trading could not have enough impact to move the stock markets. For example, Korean Stock Market consisted of approximately 12 % ratio of foreign investors and a 20% ratio in the Thai stock market in the period of leading to the crisis. The question of whether foreign investors actually influence the movement of the local stock markets has been raised.

Before the Asian financial crisis, Thailand was attractive to global investors because of the potential economic growth and the low correlation between the stock index of Thailand (SET) and S&P 500. Massive funds flowed into Thailand and drove up equity prices in the period of leading to the Asian financial crisis. Foreign investors viewed that the Stock Exchange of Thailand was over-valued based on the economic

fundamentals such as low export growth rates. high interest rates, and less investments. Foreign investors recognized there was no improvement for the rest of 1997, so they moved their funds of the Thai stock market and searched for better profitable markets in other countries. The surge of capital flows and active investors lead to a volatile atmosphere with impulsive investing and eventually financial market crash. This foreign speculation is a contributing factor to the crises in the financial markets.

LITERATURE REVIEW

The danger of global capitalism has brought attention to a number of researchers on the issue of massive capital flows which was a contributing factor of the financial crisis. Turner (1991) and Griffith-Jones (1998) observed a sharp rise of foreign portfolio in emerging markets. Turner (1991) also indicated that foreign portfolio was short-term investing and was volatile. Barth and Zhang (1999) indicated that direct purchases by foreigners were important sources of portfolio flows in the countries where international regulations are relaxed, such as Thailand.

In the 1980s, developing markets started liberalizing their stock markets and allowed foreign investors to directly invest in the markets. Kim and Singal (1993) pioneered the study of foreign equity flows in emerging markets around the beginning of the liberalization period. The evidence showed that foreign capital increased significantly when emerging markets started opening their equity markets. Henry (1997) and Huang and Yang (2000) investigated the effect of capital flows to asset prices in emerging markets including Thailand. These two studies showed consistent results that stock prices in Thailand were significantly increasing after opening the market, and had higher volatility. Tesar and Werner (1993) investigated whether U.S. fund flows have significant impact on stock prices in Thailand. The result showed that inflows of U.S. funds caused higher in stock prices.

After the recent Asian financial crisis in 1997, there was an increase in the number of studies, which investigated the relationship of foreign portfolio flows and the stock market returns. Cha (1999) explored Korean stock market by dividing data into two sub-periods, before and after crisis. He found that the results were different. Before the crisis, he found that foreign portfolio flows could predict future stock returns, and also stock returns today can predict future foreign portfolio flows. The results were not consistent during the Asian financial crisis. He found that only stock returns could predict future flows but not vice versa during the crisis. Seasholes (2000) studied the Thailand and Taiwan markets prior to and throughout the Asian financial crisis. His result was different from Cha (1999) in that he found a two-way causation between foreign portfolio flows and stock market returns. Froot, O'Connell, and Seasholes (2001) extended the study by using unique data set from the State Street Bank database. The data covered 44 developed and developing countries. They also observed a two-way relationship of foreign portfolio flows and returns in emerging markets.

OBJECTIVES

While the danger of freely allowing portfolio flows and foreign speculators in the Thai stock market has been widely discussed, there are still limited numbers of empirical researches to who have explored the role of foreign investors before and throughout the crisis period. In this research, the author contributes to the growing body of literature that examines international cross-border investment. Unlike most prior research, this study explores the relationship of foreign portfolio flows and stock returns by dividing the data into two sections (before and during the Asian financial crisis) and compares the results. In addition, to my knowledge, this is the first study to use the International Financial

Corporation Index (IFCI) in addition to evaluate the relationship of foreign portfolio flows and stock returns. The study of the relationship between foreign portfolio flows and stock returns provides the empirical answers to these following questions.

Question1: Did foreign portfolio flows influence future stock prices in the Thai stock market before/during the Asian financial crisis?

Question 2: Did stock returns of the Stock Exchange of Thailand lead future foreign portfolio flows before/during the Asian financial crisis?

METHODOLOGY

This study employed Unit root test and Granger-causality test to examine the dynamic relationship between foreign portfolio flows and stock returns. The data set for this study consists of daily time series data. The sample data is collected by the Stock Exchange of Thailand (SET). The author divided the sample data into two sub-periods, before (June 30, 1995 - July 1, 1997) and during the Asian financial crisis (July 2, 1997 to June 30, 2000). Foreign portfolio flows is collected in terms of foreign net purchases (in millions of baht). The researcher used two types of stock index returns for this study. First, the SET index, the local Thai stock index return, is calculated by taking the current market capitalization over the base market on April 30, 1975. The second set of index is obtained from International Financial Corporation, a subsidiary of the World Bank. Numerous recent studies, including, Bekaert and Harvey (1995), Claessens, Dasgupta, and Glen (1995), and Richards (1996), used the IFC index in their studies rather than local indexes for several reasons. First, The IFC index is calculated by considering foreign limited ownership. The IFC index includes market capitalization from companies that allow foreign limited ownership. The IFC index includes market capitalization from companies that allow foreign investors to invest. Second, the IFC index includes the most active stocks in the

Thai market, but covers at least 60 percent of market capitalization. Third, the IFC provides more meaningful and standard results in international financial market studies.

APPLICATION MODEL

Unit Root Test (Stationary of Data)

Testing the stationary of each variable is required for the Granger-causality test. Kluge (1994) suggested that most prior research changed time series data into log form and then took the first, second, and third difference of logarithm to derive the stationary of data set. The empirical analysis begins by examining time series properties of all these three variables: local stock index (SET), international financial corporation index (IFC), and foreign net purchase (FNB). The test is performed under the Dickey-Fuller test (ADF) and is based on the following equations and is based on these hypotheses:

H_0: Series data contains unit root. (Not stationary)

H_1: Series data does not contain unit root. (Stationary)

The ADF test are based on the following questions:

$$\Delta X_{jt} = \mu + \alpha_1 X_{jt-1} + \sum_{i=2}^{p} \gamma_i \Delta X_{jt-1} + \varepsilon_t \quad (1)$$

$$\Delta X_{jt} = \mu + \beta t \; \alpha_2 X_{jt-1} + \sum_{i=2}^{p} \gamma_i \Delta X_{jt-1+1} + \varepsilon_t \quad (2)$$

X_{jt} represents the SET, IFC, FNB. β and μ are non-zero mean and linear trend terms, respectively. The critical values are given in Fuller (1976).

Granger-Causality Test

Granger (1996) proposed the forecasting relation which was well-known later as the Granger-causality test. The Granger-causality tests test if past change in one variable has predictive power for another stationary variables. To test whether foreign portfolio flows Granger-cause stock returns, the causality equation is applied as follows:

$$R_{i,t} = \alpha_i + \sum_{j=1}^{J} \beta_{i,j} R_{i,t-j} + \sum_{k=1}^{K} \gamma_{i,k} FNB_{i,t-k} + \varepsilon_{i,t}$$

R is the Thai stock market return (SET and IFC). FNB is foreign net purchases in the Thai stock market. The optimal lag is selected by the Akaike (AIC) and Schwarz criteria (SIC). Foreign portfolio flows (or foreign net purchases: FNB) and are said to Granger-cause changes in stock returns if the lagged coefficients of foreign net purchases, as a group, are significantly different from zero. F-test statistics are calculated to test the hypothesis of:

H_o: Foreign portfolio flows in the Thai stock market do not Granger-cause daily stock returns.

H_A: Foreign portfolio flows in the Thai stock market Granger-cause daily stock returns.

To test whether stock returns Granger-cause foreign portfolio flows, the causality equation applied is as follows:

$$FNB_{i,t} = \alpha_i + \sum_{j=1}^{J} \beta_{i,j} FNB_{i,t-j} + \sum_{k=1}^{K} \gamma_{i,k} R_{i,t-k} + \varepsilon_i$$

The predictive power of stock returns to foreign portfolio flows is tested based on the following hypothesis:

H_o: Stock index returns do not Granger-cause foreign portfolio flows in the Thai stock market.

H_A: Stock index returns Granger-cause foreign portfolio flows in the Thai stock market.

RESEARCH FINDINGS

Unit Root Test

The empirical process begins by examining three variables: IFC, SET, and FNB to determine the stationary properties of each time series data. The results of Unit root test for the stationary of all series data are reported in Table 1 through 3 (Appendix). The test results are based on a standard regression with a constant in model 1, and with constant and time trend in model 2. The optimal lag length is chosen based on Akaike's Information criterion (AIC) and the Schwatz criterion (SIC). The results indicates that time series data of foreign net purchases is stationary, but SET and IFC failed to reject hypothesis. The local stock index (SET) and the international financial corporation index (IFC) contained unit root in log level. However, the first difference of logarithm in each of the series of data rejects the null hypothesis of non-stationary at the 1% levels of significance.

Granger-Causality Test

The author determined one day as a lag, and the optimum number of lags is based on Akaike's information criterion (AIC) and the Schwartz criterion (SIC). The number of lags selected for testing the causality test between foreign portfolio flows and stock market returns is three.

Before the Asian financial crisis

The causality test results are in Table 4 (Appendix), and F-statistics in column two show the causality test results. Asterisks denote the statistically significant support for the causal hypothesis at the 0.10, 0.05,

71

0.01 level. Column four provides the outcome of hypothesis testing. Panel A is based on the hypothesis of foreign portfolio and local stock return (SET). The results reported that foreign portfolio flows do not Granger-cause stock return, this is interpreted to mean that increasing of foreign portfolio flows does not drive up stock returns in the Stock Exchange of Thailand. The hypothesis that local stock index returns Granger-cause the foreign portfolio flows is rejected at the 0.01 significant level, and this is interpreted as providing support for the view that increased stock return raised foreign portfolio flows. Panel B reported results based on the IFC index. The research found only uni-directional causality from stock return to foreign portfolio flows which are similar to the use of local stock index returns. The causal relationship from stock returns to foreign portfolio flows shows lower statistical significance at 0.05 % level comparing with local stock index. It implies that foreign portfolio flows are influenced by the changing of stock returns in the Thai stock market.

During the Asian Financial Crisis

The results show that Granger-causality is unidirectional as shown in Panel A of Table 5 (Appendix), running from stock returns to foreign portfolio flows at 0.01 levels. The results show evidence that foreign portfolio flows do not influence stock market returns. The F-test during the crisis shows a stronger significance than before the crisis. However, the author did not find any significant causal relationship from foreign portfolio flows and stock returns. In Panel B, using the international corporation index (IFC) also showed a one-way causal direction from stock returns to foreign portfolio flows. In conclusion, using either the local stock index or the international financial corporation index provided the same conclusion that stock returns lead future foreign portfolio flows during the Asian financial crisis period.

CONCLUSION OF RESEARCH

The majority of previous research (Seasholes, 2000; Froot et.al., 2001; and Barth&Zhang, 2000) suggests that there is a bi-directional causal relationship between foreign portfolio flows and stock market returns. This study provides differing results from previous literature in this field. The author found that the results from Granger-causality test are consistent in two different time periods, before and during the Asian financial crisis. The findings indicate only a one way causal relationship from stock returns to foreign portfolio flows before and during the Asian financial crisis period. The results implied that the changing of stock market returns has great implications on foreign portfolio flows. In other words, ups and downs in the stock market affect the net purchase of foreign investors within the Thai stock market. The general discussion that the bull-bear market leads foreign portfolio flows holds true in Thailand. The results proved that there was no causal relationship from foreign portfolio flows to stock returns, and is interpreted to mean that only a group of individual foreign investors did not influence stock market return. This findings are against the general belief that "foreign investors fuel stock price."

The outcomes of this study have several implications. First, capital policy is not needed in the Thai stock market because there is no evidence that foreign portfolio flows influence the stock price. Second, with the presence of active foreign investors who trade on the movement of the market, Thai regulators may consider implementing policies to control short-term investors in the market.

72

REFERENCES

Barth, M. & Zhang, X. (1999).
Foreign equity flows and the Asian financial crisis.
In A. Harwood, R. E. Litan, and M. Pomerleano (Eds.),
Financial markets & development (pp. 179-218).
Washington, DC. Brookings Institution Press.

Bekaert, G. & Harry, C. R. (1995).
Emerging equity market volatility,
Journal of Financial Economics, 43. 29-77

Cha. H. (1999).
The dynamic relationship between security returns and
investment cash flows: evidence from mutual funds and
cross-border investments.
Unpublished doctoral dissertation,
University of Houston, Texas

Claessen, S., Dasgupta, S., and Glen, J. (1995).
Returning behavior in emerging stock markets.
World Bank Economic Review, 9, 131-151.

Froot, K. A., O' Connell, P.J., & Seasholes, M.S. (2001).
The portfolio flow of international investors.
Journal of Financial Economics, 59, 151-193

Griffith-Jones, S. (1998).
Global Capital Flows.
New York: St. Martin's Press, Inc.

Henry, P.B. (1997).
Stock market liberalization,
economic reform, an emerging market equity price.
Work in Progress.

Huang, B. N. & Yang, C. W. (1999).
The impact of financial liberalization on stock price
volatility in emerging markets.
Journal of comparative economics, 28, 321-339.

Kim, E. H. & Singal V. (1993).
Opening up of stock markets by emerging economies:
effect on portfolio flows and volatility of stock prices.
Manuscript in preparation. The World Bank.

Richards, A. (1996).
Volatility and predictability in national stock markets:
How do emerging and mature markets differ?
Working Paper, IMF Staff members.

Seasholes, M. (2000).
Smart foreign traders in emerging markets.
Manuscript in preparation, Harvard University.

Turner, P. (1991).
Capital flows in the 1980s: A survey of major trends
BIS Economic Paper.

73

Table 1

Stationary Test for Stock Index Return in Log form and the First Difference of Log Before the Asian Financial Crisis

VARIABLES	LAGS	ADF Test Model 1	Model 2
(1) Log Level			
IFC	3	0.738736	-1.477635
SET	3	0.974957	-1.173116
(2) First Log Difference			
IFC	4	-10.17206***	-10.31770***
SET	4	-11.09235***	-11.2669***
Critical Value			
90%		-2.5701	-3.1329
95%		-2.8678	-3.4210
99%		-3.4461	-3.9813

Note: Model 1: Model with Non-Zero Mean

Model 2: Model with Non-Zero Mean and Linear Trend

Lags are Settled by Akaike Information Criterion (AIC)

*** Represents Significance at 1% Level

74

Table 2

Stationary Test for Stock Index Return and Net Purchases During the Asian Financial Crisis

VARIABLES	LAGS	ADF Test Model 1	Model 2
(1) Series Level			
IFC	4	-2.203077	-2.141094
SET	4	-2.168651	-2.072275
FNB	3	-8.522395***	-9.566528***
INST	3	-8.449271***	-8.880165***
IND	3	-7.099050***	-7.220849***
Critical Value			
90%		-2.5695	-3.1319
95%		-2.8666	-3.4193
99%		-3.4435	-3.9777

Note: Model 1: Model with Non-Zero Mean

Model 2: Model with Non-Zero Mean and Linear Trend

Lags are Settled by Akaike Information Criterion (AIC)

*** Represents Significance at 1% Level

Table 3

Stationary Test for Stock Index Return in Log form and the First Difference of Log During the Asian Financial Crisis

VARIABLES	LAGS	ADF Test	
		Model 1	Model 2
(1) Log Level			
IFC	3	-1.972063	-1.978112
SET	3	-1.957160	-1.912540
(2) First Log Difference			
IFC	4	-11.32422***	-11.34719***
SET	4	-11.00059***	-11.01633***
Critical Value			
90%		-2.5695	-3.1319
95%		-2.8666	-3.4193
99%		-3.4435	-3.9777

Note: Model 1: Model with Non-Zero Mean

Model 2: Model with Non-Zero Mean and Linear Trend

Lags are Settled by Akaike Information Criterion (AIC)

***Represents Significance at 1% Level

Table 4

Granger-Causality Test Between Foreign Portfolio Flows and Stock Return Before the Financial Crisis

Null Hypothesis (Ho)	F-statistics	Probability	Results
(a) Foreign Portfolio Flows (FNB) and SET Index			
FNB does not Granger cause SET	0.15838	0.92426	Accep Ho
SET dose not Granger cause FNB	3.92338	0.00873***	Reject Ho
(b) Foreign Portfolio Flows (FNB) and IFC index			
FNB does not Granger cause IFC index	0.22475	0.87919	Accep Ho
IFC index does not Granger cause FNB	3.23102	0.02223**	Reject Ho

Note: ***,** Represents Significance at 1%, 5% Level

Table 5

Granger-Causality Test Between Foreign Portfolio Flows and Stock Return

During the Asian Financial Crissis

Null Hypothesis (Ho)	F-statistics	Probability	Results
(a) Foreign Portfolio Flows (FNB) and SET Index			
FNB does not Granger cause SET	1.00789	0.38877	Accep Ho
SET dose not Granger cause FNB	16.7632	1.8E-10***	Reject Ho
(b) Foreign Portfolio Flows (FNB) and IFC index			
FNB does not Granger cause IFC index	1.22714	0.29898	Accep Ho
IFC index does not Granger cause FNB	19.082	7.9E-12***	Reject Ho

Note: *** Represents Significance at 1% Level

76