The Interaction Between Investor Trading and the Performance of the Stock Exchange of Thailand

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Abstract

This study investigates the relationship between stock market returns and investment fund flows from different investor groups in the Stock Exchange of Thailand (SET) over the period from November 2009 to June 2021. The selected sample covers the periods after extremely volatile events including the global financial crisis (GFC) and the outbreak of Coronavirus disease 2019 (COVID-19) pandemic. The SET classifies its investors into four groups; i.e., local individuals, local institutions, proprietary trading, and foreign investors. This empirical research evidences the significantly positive relationship between aggregate stock market returns and institutional and foreign investors' net purchases.

Keywords: Fund flows, the Stock Exchange of Thailand, Institutional investors, Foreign investors

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ปฏิสัมพันธ์ระหว่างการซื้อขายของนักลงทุนและผลประกอบการของตลาดหลักทรัพย์แห่งประเทศไทย

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บทคัดย่อ

การศึกษานี้สำรวจความสัมพันธ์ระหว่างผลตอบแทนของตลาดหุ้นและกระแสของเงินลงทุนจากกลุ่มนักลงทุนต่างๆ ในตลาดหลักทรัพย์แห่งประเทศไทย (ตลท.) ในช่วงเดือนพฤศจิกายน 2552 ถึงเดือนมิถุนายน 2564 โดยตัวอย่างที่เลือกครอบคลุมช่วงเวลาหลังเหตุการณ์ความผันผวนรุนแรงจากวิกฤตการเงินโลก และเวลาที่มีการระบาดของโรคติดเชื้อไวรัสโคโรน่า 2019 (COVID-19) ทั้งนี้ ตลท. แบ่งกลุ่มผู้ลงทุนออกเป็น 4 กลุ่ม ได้แก่ นักลงทุนในประเทศ สถาบันในประเทศ บริษัทหลักทรัพย์ และนักลงทุนต่างชาติ การวิจัยเชิงประจักษ์นี้พิสูจน์ให้เห็นถึงอิทธิพลของการซื้อสุทธิของนักลงทุนต่างชาติต่อการซื้อสุทธิของบริษัทหลักทรัพย์เชิงบวกอย่างมีนัยสำคัญ และความสัมพันธ์เชิงบวกระหว่างผลตอบแทนของตลาดหุ้นโดยรวมกับการซื้อสุทธิของนักลงทุนสถาบันและนักลงทุนต่างชาติซึ่งไม่มีนัยสำคัญทางสถิติ

คำสำคัญ: กระแสเงินทุน ตลาดหลักทรัพย์แห่งประเทศไทย ผู้ลงทุนสถาบัน นักลงทุนต่างชาติ

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1. Introduction

This study explores the effect of investors' trading behaviors on stock market returns. Mentioned in Boyer and Zheng (2009), the investors in different groups will have different trading behaviors. For example, retailed investors are scattered with limited capital and might have to give up the stock they are holding. As a consequence, retailed investors tend to be short-term investors. Institutional investors, on the other hand, have a long-term investment goal. For example, mutual funds and pension funds are institutional investors who offer saving alternatives for their investors.

The proprietary traders are a group of investors who invest for their "brokerage" firms. The SET classifies this group of investors as market makers who have a responsibility to stabilize the market when there are extreme fluctuations in both supply and demand of shares. Before the proprietary trading was separately classified in Reuter Database in November 2009, this group of investors has been included in the local institutions. Brokerage firms, however, have shown a significant role as major traders in the SET as they possess superior research information and huge supply of shares for stock lending. They also majorly earn their income from stock trading.

The other group of investors is the group of foreign investors who have massive capital to invest in stock markets all over the world. Their investment objectives are not only to diversify their investment portfolios, but also to seek for the efficient portfolios with the opportunity to discover the highest return for a specific level of risk.

This research uses the case of the SET to study the effect of fund flows from different groups of investors on stock market returns. The SET classifies its investors into four groups: local individuals, local institutions, proprietary trading, and foreign investors. It also reports their daily trading. Each of investor groups exhibits trading behavior that might affect aggregate stock market returns. This study attempts explores to study each type of investors' trading behavior and its effect on the performance of the SET. The findings will benefit stock market investors in order to make use of investors' trading information to set up investment strategies and to form efficient portfolios.

2. Literature Review

Investors with different investment goals will have different investment strategies and trading behaviors. Trading behaviors of different investor types influence the aggregate stock market returns. There are many studies exploring the distinction of trading behaviors of each type of investor.

The groups of institutional and foreign investors are believed to be informed traders with superior information over retailed investors and would rather reflect contemporaneous stock market returns. Boyer and Zheng (2009) study the trading behaviors of investors in the U.S. equity market. Investors are

classified into seven groups: mutual funds, households, foreign investors, insurance companies, pension funds, closed-end funds, and other institutions. They exhibit that cash flows from different groups of investors that reflect heterogeneous investment behaviors will relate to aggregate stock market returns in various manners. They find that not every group of investors' trading has a significant effect on aggregate asset prices, and only fund flows from the groups of mutual funds and foreign investors evidence the significant and positive effects on stock market returns.

Many studies in this area focus on the impact of flows from institutional investors; i.e., mutual funds and pension funds, on stock market variables. For example, Warther (1995) finds that aggregate security returns are highly correlated with concurrent unexpected cash flows into mutual funds, but unrelated to concurrent expected flows. Also, mutual fund flows have a positive effect on subsequent returns, and stock market returns have a negative effect on subsequent flows. Dennis and Strickland (2002) find that firms' abnormal returns are related to institutional ownership, and institutions, such as mutual and pension funds, are following the herding behavior. Cao, Chang, and Wang (2008) use a VAR approach and daily flow data to analyze the dynamic relationship between mutual fund flow and marketwide volatility and find that inflow shock has a negative effect on stock market volatility.

Foreign investors' trading behavior has also attracted a lot of attention from academics and market participants. Grinblatt and Keloharju (2000) study the securities market in Finland and investigate the relationship between past returns and the performance of various investor types in the Finnish stock market. They find that foreign investors' portfolios outperform domestic households' portfolios. In other words, foreign investors buy winning stocks and sell losers, while domestic households tend to be contrarians. Richards (2005) explores foreign investors' trading behavior and flows in six emerging equity markets of five Asian countries, including Indonesia, the Philippines, South Korea, Taiwan, and Thailand[1]. He finds the positive relationship between aggregate stock market returns and foreign investors' flows. Nittayagasetwat (2018) uses the multiple regression models to study the market variables and foreign flows in stock market markets of four Asian countries, including Indonesia, South Korea, Taiwan, and Thailand. He finds the positive impact of foreign net purchases on aggregate stock market returns and trading volume and the negative relationship between foreign net purchases and stock market volatility in all stock markets in his study. Nittayagasetwat and Buranasiri (2019) extend Nittayagasetwat (2018) by applying a VAR approach to study the foreign-flow impact on stock market variables and finds the strong evidence supporting the positive impact of the flows on the subsequent stock market returns and the negative impact of the flows on the subsequent volatility.

[1] Richards (2005) Includes two stock exchanges in Korea which are Korea Stock Exchange (KRX) and the Korean Securities Dealers Automated Quotations (KOSDAQ) Exchange in his study.

There are many countries that investors' types have been classified. For example, Barber, Lee, Liu, and Odean (2004) analyze the aggregate portfolio returns of all investors' types in Taiwan. They find that individual investors engage in aggressive trading behavior and suffer an annual loss of 3.8 percentage points, while institutional investors enjoy an annual profit of 1.5 percentage points. They also document that foreign investors have a significant profit as well.

For the evidence of the return-trading relation in the equity markets in ASEAN and, specifically in Thailand, French (2017) explores investors' trading behavior of four investor groups in the SET and finds that the local individual investor group is the most significant group, while the foreign investor group is the least significant group on the SET returns. Although, the local individual investor group practices the negative feedback trading while the other groups practice oppositely. Wang (2007) finds that foreign trading has the highest explanatory power for volatility in the equity markets in Indonesia and Thailand and trading within foreign and local investor groups is negatively related to volatility.

Therefore, most literature documents the positive relationship between foreign and institutional investors' fund flows and aggregate stock market returns, while domestic retailed investors' and other types of investors' performance is uncorrelated or negatively related to overall market performance. This study aims to prove the relationship between those types of investors' trading and returns of the SET index.

3. Data and Methodology

This research follows Boyer and Zheng (2009) to study the relationship between flows from different types of investors and aggregate stock market returns. Using a VAR approach and a complete set of trading data of all types of investors in the SET, this study analyzes the effect of daily flows on daily stock market returns. The data set contains 3,043 observations of the daily trading days from the SET during November 2009 to June 2021. The selected sample covers the periods after extremely volatile events including the global financial crisis (GFC) and the outbreak of Coronavirus disease 2019 (COVID-19) pandemic. Boyer and Zheng (2009) suggest the normalization measure by dividing the net purchase of stocks for the investor type i for period t by the market capitalization for period t-1, so that new money relative to the total level of stock holdings by all investors and the overall price level fluctuations are considered. For each type of investors, investors' net purchases are normalized and signified as follows:

$$NP(i)_t = (B(i)_t - S(i)_t)/(Market\ Capitalization)_{t-1} \quad (1)$$

Where $NP(i)_t$ is the daily normalized net purchase of the investor type i for period t.

$B(i)_t$ is the daily investors' buying value of the investor type i for period t.

$S(i)_t$ is the daily investors' selling value of the investor type i for period t.

Each investor type, i, is classified by the SET and there are four investor types; namely, individual, institution, proprietary, and foreign. If $NP(i)_t$ is positive, it means investors of type i, for period t, buy stock for the value higher than the value they sell. Therefore, its negative sign indicates that investors of type i sell stock for the value higher than the value they buy for period t. In addition, since net purchases of all types of investors sum up to zero, the net purchases of local individuals will be dropped in order to prevent multicollinearity problems. Although the group of local institutions is explicitly classified as "institutional investors" the groups of proprietary trading and foreign investors are implicitly defined as other types of institutional investors (the group of proprietary trading is previously included in the group of local institutions, and the group of foreign investors basically consists of international funds which are institutional investors as well). Therefore, this study will focus on the impact of institutional investors, both local and foreign, on the SET returns.

To find the influence of investors' trading on stock market returns, the daily stock market returns are calculated as following:

$$R_t = (SI_t - SI_{t-1})/SI_{t-1} \quad (2)$$

Where R_t is the daily continuous return of the SET index for period t.

SI_t is the SET index for period t.

SI_{t-1} is the SET index for period t-1.

The VAR approach by Sims (1980) is used to examine the dynamic relationship between investors' net purchases and the SET returns. The first order Gaussian VAR model can be represented as:

$$Y_t = \mu + \sum_{i=1}^{n} \emptyset_i Y_{t-1} + e_t \quad (3)$$

Where $Y_t = (R_t, NP(Institution)_t, NP(Proprietary)_t, NP(Foreign)_t)'$
is a vector time series of variables.

μ is a 4-vector of intercepts.

$\emptyset$ are 4 X 4 parameter matrices with all eigenvalues of $\emptyset$ having moduli less than one so that the time series is stationary.

e_t is the error vector which is assumed to be i.i.d. 4-variate normally distributed with expectation the zero vector, and variance matrix Σ.

The VAR is considered to be the most popular methodology to examine the multivariate time-series data because it can simultaneously investigate the interrelationship of several endogenous variables in just one equation. However, before conducting the VAR, the daily time-series must be a stationary process. Therefore, the Augmented Dickey-Fuller Test (ADF) by Said and Dickey (1984) will be performed to test the stationary of the variables. The VAR lag length for this study is 5 days to investigate a week impact.

This study explores the multivariate model that consists of the daily market returns and the daily net purchases of all types of investors classified by the SET to determine the dynamic relationship between investors' fund flows and stock market reactions.

For robustness test, this study also conducts multiple regression models using the ordinary least squares (OLS) and generalized method of moments (GMM) to explore the relationship between the market variables and their lags. Nittayagasetwat (2018) and Nittayagasetwat and Buranasiri (2019) find the strong effect of concurrent investors' fund flows on the stock market returns. This study will also apply the OLS and GMM to explore the concurrent relationship of the stock market returns and investors' fund flows, as well.

4. Results

The descriptive analysis of this study presents the statistics of the SET index returns and the net purchases of three groups of explicit and implicit institutional investors which are local institutions, proprietary trading, and foreign investors from November 2009 to the end of June 2021.

Table 1 exhibits that the average return is 0.0461% per day. Institutional investors have the highest net purchases on average, and their average net purchase is 0.0015% of market capitalization. On average, foreign investors and proprietary trading have the net sale, while institutional investors have a net purchase. The average net purchases of foreign investors, institutional investors, and proprietary trading are -0.0020%, 0.0015%, and 0.0001%, respectively.

Table 1 Descriptive Statistics

	Foreign Investors	Local Institutions	Proprietary Trading	SET Index Return
Mean	-0.0020%	0.0015%	-0.0001%	0.0461%
Median	0.0000%	0.0000%	0.0000%	0.0200%
Maximum	0.3000%	0.1100%	0.0400%	7.9600%
Minimum	-0.1400%	-0.0900%	-0.0400%	-10.7600%
Std. Dev.	0.0199%	0.0153%	0.0072%	1.0266%
Skewness	1.0906	0.5366	0.0403	-0.7771
Kurtosis	25.8236	9.5878	5.5059	15.7553
Observations	3,043	3,043	3,043	3,043

For correlation analysis, Table 2 reports that the net purchases relative to market value of different types of investors are negative and not highly correlated. Among these correlation coefficients, the maximum correlation coefficient is between the pair of foreign investors and proprietary trading at 0.0114 while the lowest correlation coefficient is between the pair of local institutions and foreign institutions at -0.1031. The correlation coefficient of other pairs includes the pair of local institutions and proprietary trading at -0.0179.

For the correlation coefficients between the net flows of different investors and the SET index returns, the findings report that all of them are positive. Local institutions' net purchases have the highest positive correlation with the market returns at 0.4547, while foreign investors' net purchases have the lowest correlation with the market returns at 0.2625. The other correlation coefficient is between the SET index returns and the net purchases of proprietary trading at 0.3437.

Table 2 Correlation Analysis

	Foreign Investors	Local Institutions	Proprietary Trading	SET Index Return
Foreign Investors	1			
Local Institutions	-0.1031	1		
Proprietary Trading	0.0114	-0.0179	1	
SET Index Return	0.2625	0.4547	0.3437	1

For the time-series analyses in this research, the test of unit root shows that the overall time-series of the SET index returns and the net purchases to the market value of foreign investors, local institutions, proprietary trading, and are stationary.

Applying the Augmented Dickey Fuller Statistics as shown in Table 3, the study finds that there should be no spurious problem for the time-series analysis in the further section. Most of variables are statistically significant at 1% level.

Table 3 Unit Root Test: Null hypothesis is the variable has a unit root.

	Augmented Dickey-Fuller Test Statistics		
		P-value	Conclusion
Foreign Investors	With no intercept***	0.0000	Stationary
	With intercept***	0.0000	Stationary
	With intercept and trend***	0.0000	Stationary
Local Institutions	With no intercept***	0.0000	Stationary
	With intercept***	0.0000	Stationary
	With intercept and trend***	0.0000	Stationary
Proprietary Trading	With no intercept***	0.0001	Stationary
	With intercept***	0.0001	Stationary
	With intercept and trend***	0.0000	Stationary
SET Index Return	With no intercept***	0.0001	Stationary
	With intercept***	0.0001	Stationary
	With intercept and trend***	0.0000	Stationary

* Significant at the 10% level ** Significant at the 5% level *** Significant at the 1% level

Table 4 exhibits the results of the vector autoregressive (VAR) model investigation using five lags of the tested variables. For non-individual investors, the VAR analysis reports that the current foreign net purchase is positively influenced by all of its 5 lags and the first lag of proprietary trade or brokerage firms' net purchase. The rise or fall of the market also positively influences the foreign net purchase. The current local institutions' net purchase is positively influenced by its first 3 lags but is negatively influenced by the third to the fifth lags of foreign trade. For the impact from the movement of the stock exchange, the third and the fourth lags are also negatively influenced the local institution's net

buy. The current proprietary trade or the brokerage firms' net purchase is positively influenced by its own first lag, the first lag of foreign net purchase, and the first lag of local institutions' net purchase. However, the movement of the stock exchange from the first and the fifth lags negatively influenced the proprietary trade's net purchase.

The model also reveals that the current SET return is negatively influenced by its first lag but is positively influenced by its fifth lag, the third and the fifth lags of foreign net purchase and the fifth lag of local institution's net purchase.

Nonetheless, in practice, the valid impact of the trading information should continuously consecutively affect the dependent variable from the first lag with no gap. Hence, the foreign net purchase is truly positively influenced by its own lags, proprietary trading's net purchases, and the market return. Local institutions' net purchase is truly positively influenced by its own three lags and negatively influenced by the first lag of SET return. Proprietary trade's net purchase is truly positively influenced by its own first lag, the first lag of foreign net purchase and the first lag of local institutions' net purchase.

Table 4 Coefficient Estimates of Vector Autoregressive (VAR) Models of the normalized net purchase (in Net Purchase Balance to Market Value) from 3 Groups of Non-Individual Investors, including Foreign Investors (FORN), Local Institutions (INST), and Proprietary Trading (PROP), and SET Index Return (SET) using 5 day lags during November 2009 to June 2021.

	FORN	INST	PROP	SET
FORN(-1)	0.337334***	0.006077	0.017494**	8.172350
FORN(-2)	0.091545***	0.008085	0.010887	0.166478
FORN(-3)	0.063327***	-0.057384***	-0.003403	-2.181411*
FORN(-4)	0.045620**	-0.033981**	-0.011381	-1.214455
FORN(-5)	0.046992**	-0.056139***	0.005092	-2.352912**
INST(-1)	-0.041437	0.268192***	0.029747***	2.537870
INST(-2)	0.005712	0.061627***	0.001252	-2.414704
INST(-3)	0.033915	0.053519**	-0.002565	2.770792*
INST(-4)	-0.012872	-0.016422	-0.005380	0.441597
INST(-5)	-0.032647	0.024275	-0.008088	-3.825976**

Table 4 Coefficient Estimates of Vector Autoregressive (VAR) Models of the normalized net purchase (in Net Purchase Balance to Market Value) from 3 Groups of Non-Individual Investors, including Foreign Investors (FORN), Local Institutions (INST), and Proprietary Trading (PROP), and SET Index Return (SET) using 5 day lags during November 2009 to June 2021. (Continue)

	FORN	INST	PROP	SET
PROP(-1)	0.106415**	0.054091	0.079273***	-0.259145
PROP(-2)	0.049934	-0.052302	-0.010386	-3.509036
PROP(-3)	0.016101	-0.003821	-0.010862	0.311329
PROP(-4)	-0.015958	-0.017696	0.010870	0.540095
PROP(-5)	0.070918	-0.071675	0.019022	-3.870106
SET(-1)	0.002620***	-0.000618*	-8.69E-05	-0.078544***
SET(-2)	0.000460	-0.001952	0.000596***	0.022336
SET(-3)	-8.44E-05	-0.001070***	0.000376**	0.002762
SET(-4)	0.000281	-0.000772**	0.000473***	-0.012157
SET(-5)	1.59E-05	0.000449	0.000281*	0.102317***
Intercept	-9.08E-06	8.03E-06	-1.09E-06	0.000493
Adjusted R-Square	0.270185	0.151811	0.027259	0.022496

* Significant at the 10% level ** Significant at the 5% level *** Significant at the 1% level

The coefficients estimated are from the Vector Autoregressive (VAR) Model.

$$Y_t = \mu + \sum_{i=1}^{n} \emptyset_i Y_{t-1} + e_t$$

Where $Y_t = (R_t, NP(Institution)_t, NP(Proprietary)_t, NP(Foreign)_t)'$
is a vector time series of variables.

μ is a 4-vector of intercepts.

$\emptyset$ are 4 X 4 parameter matrices with all eigenvalues of $\emptyset$ having moduli less than one so that the time series is stationary.

e_t is the error vector which is assumed to be i.i.d. 4-variate normally distributed with expectation the zero vector, and variance matrix Σ.

The main contributions of this paper lie on the findings that the net purchases of local institutions and foreign investors significantly drive up the market on the following day, while proprietary trading has no effect on the overall returns of the SET. The findings are consistent with the study by Boyer and Zheng (2008) who explore the effect of investors' trading on the U.S. equity market. This study also finds that local institutions and foreign investors consecutively trade stocks; i.e., foreign investors consecutively buy stocks for many days while brokerage firms do consecutive trading for just couple days.

5. Conclusion

Investors in different groups will have different trading behaviors. For example, retailed investors are scattered with limited capital, so they are plausibly the short-term investors. The institutional investors, on the other hand, have enormous fund and a longterm investment goal. The proprietary trading is done by brokerage firms which are separated from the group of institutional investors by the Stock Exchange of Thailand (SET). This group of investors possesses superior information since it has its own research facility, and it earns major income from its stock investment. The group of foreign investors has massive capital to invest in stock markets all over the world seeking for the efficient portfolios with the highest return for a specific level of risk. Consistent with the study by Boyer and Zheng (2008), the net purchases of local institutions and foreign investors have a high positive effect on the aggregate stock market returns on the following day. However, the results are not statistically significant. The momentum trading by local institutions and foreign investors continues for several days, so they are still the major players on the capital market in Thailand.

The effect of local institutions, i.e., mutual funds, on the stock market returns has been supported by many studies, i.e., Warther (1995), Dennis and Strickland (2002), Cao, Chang, and Wang (2008), etc. Foreign investors' trading is evidenced by many studies, i.e., Grinblatt and Keloharju (2000), Richards (2005), Nittayagasetwat (2017), and Nittayagasetwat and Buranasiri (2020), etc., that its net purchases have a positive effect on the domestic stock market returns.

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