

Do They Trade by Sentiment? An Examination on the Mutual Fund in The Stock Exchange of Thailand

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Introduction

Conventional finance has long posited that institutional investors are rational and execute their trade on relevant information. On the other hand, retail investors are relatively irrational and frequently trade on sentiment. However, some empirical studies find evidence against these common beliefs.

Literature review

What is SENTIMENT?

- Feelings, emotion or beliefs, and represents irrationality
- Tversky and Kahneman (1974); bias, self-believe and past experiences.
- Kahneman and Tversky (1979); Prospect theory suggests loss aversion behavior.
- Misjudge future cash flow and cause the mispricing (De Bont et al., 1990, De Long et al., 1990)
- Risk aversion level is changed (Forgas, 1995)
- Baker and Wurgler (2006) construct composite index which can identify market sentiment level.
- Chuthanondha et al., (2016) follow Baker and Wurgler to construct sentiment index in Thailand.

Literature review

Rational investor VS Irrational investor

- In the meaning of 'rationality', Investors make homogeneous decision based on relevant information and execute their trade correctly. (Fama, 1965).
- There are arbitragers who step in to take the benefit of asset mispricing.
- Arbitrage process is too risky and costly (Shleifer et al., 1997).
- Arbitraging against irrational investors make the arbitrage have less rationality and more sensitive to sentiment.

Literature review

Who is irrational investor?

- Conventional theories address that irrational investors are retail investors.
- Lee et al., (1991) report the relationship between retail investors and sentiment via **closed-end fund discount**.
- Retail investor **hold unrealize loss** and **realize profit too early** (Odean, 1998).
- Baker and Wurgler (2006) suggest that retail investors are sensitive to the change of the sentiment.
- In Thailand, Phongluangtham (2014) find that retail investors are related to the sentiment.
- Brunnermeier and Nagel (2004) find that hedge funds play an important role in the financial bubble in 2000.
- De Vault et al. (2019) show that institutional investors trade based on sentiment by buying high-risk stocks when the sentiment index is raising

Methodology

Whether domestic institutional investors in Thailand make investment decisions based **only** on rational factors or not

Methodology

Hypotheses

	Research questions	Empirical tests
H1	No relationship between investors' trading value and the change of the ISI $\rho(NTVR_t^v, \ln ISI_m^\perp) = 0$	Correlation
H2	No relationship between the average change in ownership level and the average change of the ISI $\rho(\overline{\Delta Inst}_t^{f,\sigma}, \overline{\Delta ISI}_t^\perp) = 0$	Correlation

Methodology

Hypotheses

	Research questions	Empirical tests
	No Granger-causality between domestic institutional investors' trading behavior and the change of the ISI	
H3	$InstDS_t^{f,\sigma^{H-L}} = \sum_{m=1}^n v_m \overline{\Delta ISI}_{t-m}^\perp + \sum_{p=1}^q \tau_p InstDS_{t-p}^{f,\sigma^{H-L}} + \varepsilon_t$ $\overline{\Delta ISI}_t^\perp = \sum_{m=1}^n v_m InstDS_{t-m}^{f,\sigma^{H-L}} + \sum_{p=1}^q \tau_p \overline{\Delta ISI}_{t-p}^\perp + \varepsilon_t$	Granger-causality
	No cointegration between domestic institutional institutional demand shock in risk stocks and the change of the ISI	
H4	$InstDS_t^{f,\sigma^{H-L}} = \beta_0 + \beta_1 \overline{\Delta ISI}_t^\perp + \varepsilon_t$ $\hat{\varepsilon}_t = InstDS_t^{f,\sigma^{H-L}} - \hat{\beta}_0 - \hat{\beta}_1 \overline{\Delta ISI}_t^\perp$	Cointegration

Methodology

Hypotheses

	Research questions	Empirical tests
	Domestic institutional investors' demand shock in risky stocks cannot predict SET index's excess return	
H5	Model 1; $\ln ExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \ln ExSET_t + \beta_3 \Delta VolP_t + \varepsilon_t$	Regression
	Model 2; $\ln ExSET_{t+1} = \beta_0 + \beta_1 \overline{\Delta ISI}_t^\perp + \beta_2 \ln ExSET_t + \beta_3 \Delta VolP_t + \varepsilon_t$	
	Model 3; $\ln ExSET_{t+1} = \beta_0 + \beta_1 \overline{InstDS}_t^{All, \sigma^{H-L}} + \beta_2 \ln ExSET_t + \beta_3 \Delta VolP_t + \varepsilon_t$	
	Model 4; $\ln ExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \overline{\Delta ISI}_t^\perp + \beta_3 \overline{InstDS}_t^{All, \sigma^{H-L}} + \beta_4 \ln ExSET_t + \beta_5 \Delta VolP_t + \varepsilon_t$	
	Model R1; $\ln ExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \overline{sqSenti}_t^\perp + \beta_3 \ln ExSET_t + \beta_4 \Delta VolP_t + \varepsilon_t$	
	Model R2; $\ln ExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \overline{sqSenti}_t^\perp + \beta_3 \overline{\Delta ISI}_t^\perp + \beta_4 \overline{InstDS}_t^{All, \sigma^{H-L}} + \beta_5 \ln ExSET_t + \beta_6 \Delta VolP_t + \varepsilon_t$	

Methodology

Data

Investor		Sentiment	Market Data
Domestic institutional investor	Others*		
1. 384 Funds' quarterly report 2016 - 2019 (source; SEC) 2. Monthly net trading value 2000 - 2019 (source; SETSMART)	Monthly net trading value 2000 - 2019 (source; SETSMART)	Investor Sentiment Index on a monthly basis 2000 - 2019 (Chuthanondha et al., 2015) publish by SET	1. Daily stocks price 2016 - 2019 (source; Bloomberg) 2. Number of shares outstanding at the end of quarter 2016 - 2019 (source; Bloomberg)

*There are 4 types of investors in Thailand i.e., retail, institutional, foreign, and propriety trader.

Methodology

Variables

	Name	Calculation
Sentiment proxy (ISI)	ISI level (Quarter)	$\overline{Senti}_t^\perp = \frac{Senti_m^\perp + Senti_{m-1}^\perp + Senti_{m-2}^\perp}{3}$
	Average change of the ISI (Quarter)	$\overline{\Delta ISI}_t^\perp = \frac{\left[\ln\left(\frac{Senti_m^\perp}{Senti_{m-1}^\perp}\right) + \ln\left(\frac{Senti_{m-1}^\perp}{Senti_{m-2}^\perp}\right) + \ln\left(\frac{Senti_{m-2}^\perp}{Senti_{m-3}^\perp}\right) \right]}{3}$
Domestic institutional investor	Ownership level	$OWNER_{i,t}^f = \frac{NSH_{i,t}^f}{SO_{i,t}}$
	Change in ownership level	$\Delta OWNER_{i,t}^f = \ln\left(\frac{OWNER_{i,t}^f}{OWNER_{i,t-1}^f}\right)$
	Average change in ownership level in each group risk profile (high, neutral, and low)	$\overline{\Delta Inst}_t^{f,\sigma} = \frac{\sum_{i \in \sigma}^{n_{f,t}^\sigma} \Delta OWNER_{i,t}^f}{n_{f,t}^\sigma}$
	Institutional demand shock in risky stocks	$\overline{InstDS}_t^{f,\sigma^{H-L}} = \overline{\Delta Inst}_t^{f,\sigma^H} - \overline{\Delta Inst}_t^{f,\sigma^L}$

Results and discussion

Hypothesis 1

Table I. Correlation metric between trading value and the change of sentiment index

All data is in monthly basis. *** is P-value < 0.01. ** is P-value < 0.05. * is P-value < 0.1. Domestic Inst = net trading value ratio of local institution. Prop Trade = net trading value ratio of proprietary trading investor. Foreign = net trading value ratio of foreign investor. Retail = net trading value ratio of local retail investor. InTotalVal = $\ln(\text{total market trading value in month } T / \text{total market trading value in month } T-1)$. InISI = $\ln(\text{ISI Index in month } T / \text{ISI Index in month } T-1)$.

Panel A	January 2000 - December 2019 (Monthly)					
	Domestic Inst	Prop trade	Foreign	Retail	InTotalVal	InISI
Domestic Inst	1.00	0.09	-0.66***	0.33***	-0.35***	-0.18***
Prop trade		1.00	-0.07	-0.08	0.05	0.05
Foreign			1.00	-0.86***	0.37***	0.20***
Retail				1.00	-0.28***	-0.19***
InTotalVal					1.00	0.38***
InISI						1.00
Panel B	October 2016 - December 2019 (Monthly)					
	Domestic Inst	Prop trade	Foreign	Retail	InTotalVal	InISI
Domestic Inst	1.00	-0.10	-0.51***	-0.08	-0.33**	-0.03
Prop trade		1.00	0.34**	-0.60***	0.13	0.25
Foreign			1.00	-0.74***	0.18	0.30*
Retail				1.00	0.01	-0.35**
InTotalVal					1.00	0.29*
InISI						1.00

Results and discussion

Hypothesis 2

Table II. Correlation metric between the change of owner level in each stock risk profile group and the change of ISI index.

*** is P-value < 0.01. ** is P-value < 0.05. * is P-value < 0.1. All data is in quarterly basis from 3Q2016 to 3Q2019. Low vol. stocks (low σ) is the average change of the ownership level of low-volatility stocks. High vol. stocks (High σ) is the average change of the ownership level of high-volatility stocks. High σ - Low σ is the difference between average c high-volatility and low-volatility or institutional demand shock in risk stocks ($\overline{InstDS}_t^{f,\sigma^{H-L}}$)

Risk profile groups	$\rho \left(\overline{\Delta Inst}_t^{f,\sigma}, \overline{\Delta ISI}_t^\perp \right)$		
	All Funds	Equity Funds	Mixed Fund
Low volatility stocks	0.4861	0.4798	0.3780
Neutral	0.3495	0.4778	-0.1102
High volatility stocks	0.6466**	0.5752*	0.5893*
High σ - Low σ ($\overline{InstDS}_t^{f,\sigma^{H-L}}$)	0.2274	0.0684	0.4511

Results and discussion

Hypothesis 3

Table III. Result of panel Granger causality testing (Dumitrescu and Hurlin, 2012)

$\overline{\Delta ISI}_t \sim \overline{\Delta Inst}_t^\sigma$ means the change of Thailand sentiment index (ISI index) caused by the change of ownership level (or demand shock in risky stocks when we consider High σ - Low σ group). $\overline{\Delta Inst}_t^\sigma \sim \overline{\Delta ISI}_t$ means mean the change of ownership level (or demand shock in risky stocks when we consider High σ - Low σ group) caused by the change of Thailand sentiment index (ISI index). The value in the table is a standardize statistic recommended by Dumitrescu and Hurlin (2012). *** is P-value < 0.01. ** is P-value < 0.05. * is P-value < 0.1. All data is in quarterly basis, 3Q2016 to 3Q2019. High σ - Low σ is the different between high-volatility and low-volatility or institutional demand shock in risk stocks ($\overline{InstDS}_t^{f,\sigma^{H-L}}$)

	All Funds		Equity Funds		Mixed Funds	
	$\overline{\Delta Inst}_t^\sigma \sim \overline{\Delta ISI}_t$	$\overline{\Delta ISI}_t \sim \overline{\Delta Inst}_t^\sigma$	$\overline{\Delta Inst}_t^\sigma \sim \overline{\Delta ISI}_t$	$\overline{\Delta ISI}_t \sim \overline{\Delta Inst}_t^\sigma$	$\overline{\Delta Inst}_t^\sigma \sim \overline{\Delta ISI}_t$	$\overline{\Delta ISI}_t \sim \overline{\Delta Inst}_t^\sigma$
High σ - Low σ ($\overline{InstDS}_t^{f,\sigma^{H-L}}$)	8.90***	74.95***	-1.70*	32.05***	3.35***	16.08***

Results and discussion

Hypothesis 4

Table IV. Result of panel cointegration testing (Pedroni, 1999)

All data is in quarterly basis from 3Q2016 to 3Q2019. Pedroni (1999) suggested 7 tests for panel data cointegration. The first 4 method is a within-dimensions-based statistics simply as panel cointegration statistics, the other three are between-dimensions-based statistics as group mean panel cointegration. Compare the empirical value to critical value ($m = 2$ or 2 regressors), if empirical value higher (for nipanel) or lower (other six testing methods) than the critical value which suggest by the theory the accept H1. H0; No cointegration. Our research used only ADF t-statistics of panel regression (tpanelpar) to test our hypothesis. We tested institutional demand shock in risky stocks of all funds with the change of Thailand sentiment index (ISI index).

		Cointegration ($\overline{InstDS}_t^{All fund, \sigma^{H-L}}, \overline{\Delta ISI}_t^\perp$)		
	Testing Methods	Empirical	Standardized	Critical Value (2)
nipanel	Variance Ratio statistics	6.82	-12.49	> 6.982
rhopanel	Philips and Perron rho-statistics	-196.77	-10.93	< -6.388
tpanelnonpar	Philips and Perron t-statistics	-68.85	-32.39	< -1.662
tpanelpar	Augmented Dickey Fuller t-statistics	-2,540.23	-2,011.72	< -1.662
rhogroup	Philips and Perron rho-statistics	-196.25	-4.21	< -9.889
tgrouppar	Philips and Perron t-statistics	-69.22	-43.67	< -1.992
tgrouppar	Augmented Dickey Fuller t-statistics	-65.64	-39.22	< -1.992

Results and discussion

Hypothesis 5

Table V. Random effect panel regression

*** is P-value < 0.01. ** is P-value < 0.05. * is P-value < 0.1. All data display in quarterly basis, 3Q2016 to 3Q2019. \overline{Senti}_t^\perp is Thailand sentiment index (ISI index). $\overline{sqSenti}_t^\perp$ is the square value of Thailand sentiment index (ISI index). $\overline{\Delta ISI}_t^\perp$ is the change of Thailand sentiment index (ISI index). $\overline{InstDS}_t^{All Fund, \sigma^{H-L}}$ is institution (all 384 funds data) demand shock in risky stocks. $lnExSET_{t-1}$ is SET Index quarterly return over 3-month Thailand Government bond. $\Delta VolP_t$ is volatility premium. Model 1; $lnExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 lnExSET_t + \beta_3 \Delta VolP_t + \varepsilon_t$. Model 2; $lnExSET_{t+1} = \beta_0 + \beta_1 \overline{\Delta ISI}_t^\perp + \beta_2 lnExSET_t + \beta_3 \Delta VolP_t + \varepsilon_t$. Model 3; $lnExSET_{t+1} = \beta_0 + \beta_1 \overline{InstDS}_t^{All, \sigma^{H-L}} + \beta_2 lnExSET_t + \beta_3 \Delta VolP_t + \varepsilon_t$. Model 4; $lnExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \overline{\Delta ISI}_t^\perp + \beta_3 \overline{InstDS}_t^{All, \sigma^{H-L}} + \beta_4 lnExSET_t + \beta_5 \Delta VolP_t + \varepsilon_t$. Model R1; $lnExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \overline{sqSenti}_t^\perp + \beta_3 lnExSET_t + \beta_4 \Delta VolP_t + \varepsilon_t$. Model R2; $lnExSET_{t+1} = \beta_0 + \beta_1 \overline{Senti}_t^\perp + \beta_2 \overline{sqSenti}_t^\perp + \beta_3 \overline{\Delta ISI}_t^\perp + \beta_4 \overline{InstDS}_t^{All, \sigma^{H-L}} + \beta_5 lnExSET_t + \beta_6 \Delta VolP_t + \varepsilon_t$.

Coefficient	Model 1	Model 2	Model 3	Model 4	Model R1	Model R2
Intercept	-0.4068*	-3.2553***	-2.5095***	-7.9540***	-5.4811***	-9.0613***
\overline{Senti}_t^\perp	-0.0607***			0.1336***	0.2737***	0.2102***
$\overline{sqSenti}_t^\perp$					-0.0046***	-0.0011**
$\overline{\Delta ISI}_t^\perp$		14.6239***		19.5755***		19.3220***
$\overline{InstDS}_t^{f, \sigma^{H-L}}$			-0.6508***	-0.6630***		-0.6633***
$lnExSET_t$	-0.6807***	-1.2359***	-0.7275***	-1.4925***	-0.7117***	-1.4890***
$\Delta VolP_t$	0.1337***	0.2702***	0.1581***	0.3527***	0.1081***	0.3437***
R-Squared	32.37%	48.07%	33.01%	53.33%	33.77%	53.41%
Adj.R-Squared	32.32%	48.03%	32.96%	53.27%	33.71%	53.33%

Conclusion

- Most investors in Thailand are likely to be **influenced by sentiment**
- **Simultaneous causality** exists
- They prefer high-risk stocks when they are optimistic.
- When they buy high-risk more than low-risk, market excess return decline in the next period.
- **Cannot claim** that domestic institutional investors **are pure** sentiment traders
- A chance to **execute their trades irrationally is higher** than what conventional theory suggested.

Conclusion

Limitations

- Short-time horizon (2016 -2019)
- Monthly basis is more desirable
- Sample size is a bit too small (384 funds)

Possible futures research

- Acquire sufficient historical funds' data on monthly basis
- Other sentiment factors
- Other models to determine market excess return
- Investment performance

Q & A