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Investor Sentiment Timing Ability of Mutual Fund Managers: A Comparative Study and Some Extensions

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Abstract

Purpose: This study aims to explore an ability to time market-wide investor sentiment of mutual fund managers in an emerging market. **Research design, data, and methodology**: Based on data of Thai mutual fund market over the period of 2000-2019, our sample includes 283 equity funds, consisting of 204 bank-related funds and 79 nonbank-related funds. We perform our regression analyses at the aggregate and portfolio levels. **Results**: Under the non-normal distribution of return, we find different behaviors between the best- and worst-performing funds in an ability to time market-wide investor sentiment in Thailand, which is dissimilar to the findings in the U.S. Bottom fund managers act as sentiment hedgers, who decrease (increase) an exposure of investment portfolios when the investor sentiment is high (low). Oppositely, top fund managers are likely to chase investor sentiment. **Conclusion**: We find that only the worst-performing fund managers, especially for bank-related funds are able to time the market-wide investor sentiment. An advantage of gaining information from their bank's clients is a key success. A competition in the mutual fund industry, an ability to predict fundamentals, and financial literacy are possible reasons to explain the main findings found in this study.

Keywords : Investor Sentiment; Timing Ability; Mutual Fund Performance; Emerging Market; Non-normal Distribution; Coskewness

JEL Classification Code: G11; G12; G21; G23; G40

1. Introduction

Scholars have attempted to identify timing abilities of mutual fund managers at the market-wide level that originally starts from an ability to time market return (Treynor & Mazuy, 1966; Henriksson, 1984; Ferson & Schadt, 1996), market volatility (Busse, 1999), and market liquidity (Cao et al., 2013; Wattanatorn et al., 2020; Wattanatorn & Tansupswadikul, 2019). Most findings support the volatility timing ability as well as the liquidity timing ability, but not for the market return timing ability. Recently, Zheng et al. (2019) find that mutual fund managers in the U.S. are able to time aggregate investor sentiment, in which the fund managers can either act as sentiment hedgers or sentiment chasers. Sentiment-hedging fund managers would reduce the exposure of investment portfolio during a high investor sentiment period, while sentiment-chasing fund managers would do oppositely.

This paper investigates the aggregate investor sentiment timing ability of mutual fund managers in an emerging

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market. In other words, we study whether or not mutual fund managers are able to time a behavioral factor rather than traditional stock market characteristics (return, volatility, and liquidity). The study contributes to prior literature in three main aspects that are 1) the model improvement, 2) the investigation of bank and mutual fund relationship, and 3) the sample setting in Thailand, which no study in an emerging country have been explored.

Motivations along with research questions of the study are as follows. First, the ability to time aggregate investor sentiment of mutual fund managers is relatively novel. To the best of our knowledge, Zheng et al. (2019) are the first pioneers to investigate this ability in the U.S. market. Up to date, evidence in international equity markets is nonexistent. The findings in mature equity markets do not generalize for young equity markets because of market frictions, regulations, and market participants. Moreover, an effect of investor sentiment on equity markets is not uniform across countries because of differences in stock characteristics (Baker & Wurgler, 2006), cultural factors, and institutional quality (Schmeling, 2009; Corredor et al., 2013). Second, Baker and Wurgler (2006) show an important role of aggregate sentiment on cross-sectional stock returns. A high level of aggregate investor sentiment is negatively associated to future stock returns. Thus, we question that mutual fund managers in Thailand possess the ability to time investor sentiment as found in the U.S. Third, as suggested by Harvey and Siddique (2000), Buckle et al. (2016), and Wattanatorn et al. (2020), the return distribution in emerging markets is more nonnormal than in developed markets, timing ability models of mutual fund managers in emerging markets should take a potential effect of higher-order moments as presented in this study. Thus, our models are less misspecified. Last, the dataset in Thailand allows us to investigate a bank-mutual fund relationship, which businesses in Thailand heavily rely on bank financing (Prommin et al., 2014; Wattanatorn & Nathaphan, 2019; Wattanatorn & Nathaphan, 2020). Importantly, the strand of this research is still limited. Bolton et al. (2007) show that bank-related mutual funds have an informational advantage because of business connection of banks and their clients. We investigate whether or not bank-related mutual funds outperform nonbank-related mutual funds because of a better ability to time investor sentiment.

Over the examined sample period, we do not observe the mutual fund managers' ability to time the aggregate investor sentiment in the Thai equity market, which is different from the finding of Zheng et al. (2019) in the U.S. market. Nevertheless, there exists distinguishable behavioral difference between the best-performing and worst-performing mutual funds. Worst-performing mutual fund managers are investor sentiment hedgers as they increase (decrease) the portfolios' exposure to the market, when the investor sentiment is low (high). Oppositely, the best-performing mutual fund managers are likely to be investor sentiment chasers. Moreover, the evidence is not confounding to non-normal distribution of return (the coskewness risk factor), the investor sentiment index, the market return timing ability, the volatility timing ability, and the liquidity timing ability. For the bank-mutual fund relationship, we find evidence on the investor sentiment timing ability of worst-performing bank-related fund managers, acting as investor sentiment hedgers; however, the opposite evidence is found on top-performing bank-related mutual funds, acting as investor sentiment chasers. As the hedgers, fund managers decrease (increase) the exposure of investment portfolios when the investor sentiment is high (low). We offer several possible explanations to argue nonexistence of the ability to time investor sentiment among high-performing funds, including the level of competition in the mutual fund industry, the predictability in emerging equity markets, and the financial literacy.

2. Literature Review

2.1. Investor Sentiment Index of Thailand

Capital Market Research Institute as a member of the Stock Exchange of Thailand initiated a project of the construction of market-wide investor sentiment by employing available financial data in the Thai equity markets. The seminal work by Baker and Wurgler (2006), suggesting the methodology of market-wide investor sentiment index by using secondary data, shows that the composite investor sentiment index influences cross-sectional stock returns in the New York Stock Exchange. Several scholars (Stambaugh et al., 2012; Baker et al., 2012; Yu & Yuan, 2011). adopt this methodology in their studies. As an increasingly important contribution of investor sentiment in financial markets, the Stock Exchange of Thailand initiated a project to create the market-wide investor sentiment index of Thailand in year 2014. This project was novel at that time, as it was the first time to have the investor sentiment index in Asia. However, the original investor sentiment index suggested by Baker and Wurgler (2006) is constructed by using six components, namely closed-end fund discount, trading volume turnover, number of IPOs stock, first day return on IPOs, share of equity issues in total equity and debt issues, and dividend premium, data availability in Thailand is limited. There exists no trade in closed-end funds in the secondary market of Thailand. Thus, the investor sentiment index of Thailand is created by using only five components.

A market-based investor sentiment index overcomes shortcomings in a survey-based investor sentiment index, as it is cheaper and tends to be less biased due to interviewees' opinions. The main methodology is the principal component analysis, allowing us to examine various possible factors and to identify the most important determinants of investor sentiment index at the same time. The validity of the investor sentiment index of Thailand was originally validated by the study of Thubdimphun et al. (2015), confirming the predictability on stock returns in the Thai stock market. The Stock Exchange of Thailand has publicly published the investor sentiment index on monthly basis until the present time.

3. Research Methods and Materials

3.1. Data

Of Thailand, active and inactive domestic equity mutual fund data, the one-month T-bill, and stock prices are obtained from Lipper, the Thai Bond Market Association, and DataStream, respectively, over the period of January 2000 to December 2019. Data on the aggregate investor sentiment are obtained from the Capital Market Research Institute, a member of the Stock Exchange of Thailand, which are mainly constructed based on the suggested methodology of Baker and Wurgler (2006). However, the principal components of the investor sentiment index of Thailand comprise trading volume turnover ($LDTURN$), number of IPO stocks ($NIPO$), share of equity issues in total equity and debt issues (S), and net foreign trade ($NFIBVAL$), which are different from those in Baker and Wurgler (2006). In summary, there are 283 equity funds, consisting of 204 bank-related funds and 79 nonbank-related funds.

Panel A of Table 3 demonstrate basic characteristics of main variables in the study. Mean values of risk premium factors range from 0.2121% per month (sentiment premium: SEN) to -4.1624% per month (illiquidity premium: $Illiq$), along with their respective standard deviations of 1.5133% and 1.1222%. Mostly, the mean values and their respective median values of all variables in Panel A are different, showing a potential of nonnormal distribution. Panel B of Table 3 reports the returns of mutual funds' portfolio for the full sample and for the quintile portfolios. Looking at average returns of the entire sample, the best-performing portfolios (P5), and the worst-performing portfolios (P1) are 0.4226%, 2.7171%, and -1.9914%, respectively, while the standard deviations range from 5.6666% (P5) to 6.0753% (P1). It is interesting to note that the standard deviations of the portfolio's returns between the best-performing (5.6666%) and worst-performing (6.0753%) funds are not much different, showing a truly higher risk-adjusted returns in the best-performing funds. Panels C and D of Table 3 provide basic statistics of bank-related (BR) and nonbank-related (NBR) mutual fund's portfolios, respectively. Overall, the average returns of bank-related mutual funds are generally higher than those of nonbank-related mutual funds at both the full sample and portfolio levels, as reconfirmed by the parametric test of equality in mean returns as shown in Panel E. The zero-cost portfolio of bank-related funds (BR6) generates an average return higher than that of nonbank-related funds (NBR6). These preliminary results show a superior performance of bank-related mutual funds.

3.2. Factor Formation

As we employ several factors in our methodology, this sections briefly demonstrates the construction of variables used in this study.

3.2.1. Risk Premiums on Size and Book-to-market Value Factors and Momentum Factor

The Fama and French (1993) three-factor and Carhart (1997) four-factor models are widely employed in finance literature. We form the size risk premium, value risk premium, and momentum factors following the methodologies of Fama and French (1992) and Jegadeesh and Titman (1993), respectively.

To construct the size risk premium factor, we rank each stock by the end-of-the-year market capitalization and divide into two portfolios namely big market capitalization (B) and small market capitalization (S) portfolios by employing the median of all market capitalizations as the criterion. Then, we use the book-to-market value (BTMV) ratio for the second sorting procedure by classifying as high BTMV (top 30th percentile), middle BTMV, and low BTMV (bottom 30th percentile). After the double sorting procedure, six portfolios are created as

Table 1: Value portfolio sorting

Book-to-Market Value Ratio / Market Capitalization	High (H)	Middle (M)	Low (L)
Big (B)	BH	BM	BL
Small (S)	SH	SM	SL

Then we form the small-minus-big market capitalization mimicking portfolio (SMB) and high-minus-low book-to-market value ratio mimicking portfolio (HML) as follows.

$$SMB = \frac{1}{3}(SL + SM + SH) - \frac{1}{3}(BL + BM + BH) \quad (1)$$

$$HML = \frac{1}{2}(SH + BH) - \frac{1}{2}(SL + BL) \quad (2)$$

For the momentum factor (MOM), we create the winner

and loser portfolios based on 2 to 12 months historical performance. The value-weighted winner and loser portfolios are defined as the highest 70th and the lowest 30th of stock returns, respectively. Similar to the size and value risk premium factors, we create six portfolios as

Table 2: Size portfolio sorting

Portfolio / Market Capitalization	Winner (W)	Loser (L)
Big (B)	BW	BL
Small (S)	SW	SL

Then we formulate the MOM strategy as follows.

$$MOM = \frac{1}{2}(SW + BW) - \frac{1}{2}(SL + BL) \quad (3)$$

3.2.2. Market Return Timing Ability

An ability to time market factor of mutual fund managers refers to a time-varying capital asset allocation. Starting from the capital asset pricing model, Treynor and Mazuy (1966) suggest an approach to measure the market timing ability of mutual fund managers as follows.

$$r_{p,t+1} = \alpha_p + \beta_p Rm_{t+1} + \gamma_p Rm_{t+1}^2 + \upsilon_{p,t+1} \quad (4)$$

where $r_{p,t+1}$ and Rm_{t+1} are returns of portfolio p and excess market return in month $t+1$, respectively. β_v and γ_v represent systematic risk and market timing ability, respectively. $\upsilon_{p,t+1}$ is an error term of portfolio p in month $t+1$. A significantly positive γ_n demonstrates the market return timing ability. A mutual fund manager increases (decreases) the exposure of portfolio to the market exposure before a rise (fall) in market return.

3.2.3. Market Volatility Timing Ability

Busse (1999) extends the work of Treynor and Mazuy (1966) in order to investigate an ability to time market volatility of mutual fund managers in terms of both theoretical framework and empirical results. Using the Taylor's series expansion, the relationship between market beta and difference between market volatility and its time-series mean is linear and the volatility timing ability is able to be tested from the following regression.

$$r_{p,t+1} = \alpha_p + \beta_p Rm_{t+1} + \gamma_p Rm_{t+1}(\sigma_{m,t+1} - \bar{\sigma}_m) + \theta_p Rm_t + \upsilon_{p,t+1} \quad (5)$$

where $\sigma_{m,t+1}$ is the market volatility in month $t+1$, which is obtained by GARCH (1,1) estimation and $\bar{\sigma}_m$ is a time-series average market volatility over the $[t-60, t-1]$ rolling window period. γ_p represents market volatility timing ability of mutual fund managers. A significant negative γ_p demonstrates the volatility timing ability. A mutual fund manager increases (decreases) the exposure of portfolio to the market exposure before a fall (rise) in market volatility.

3.2.4. Market-wide Liquidity Timing Factor

Cao et al. (2013) adopt the same approach as in the study of Busse (1999) in order to identify an ability to time market-wide volatility of mutual fund managers. They also show that market beta is a linear function of difference in market-wide liquidity and its time-series mean. The liquidity measure in their study is the Pastor and Stambaugh (2003) illiquidity measure. However, due to the data limitation in emerging markets, we employ he Kang and Zhang (2014) as an illiquidity measure ($AdjILLIQ_{i,t}$) in this study as it is more appropriate measure in less liquid markets (Woraphon et al., 2020) as shown below.

$$AdjILLIQ_{i,t} = \left[ln\left(\frac{1}{T}\sum_{d=1}^{T}\frac{|R_{t,d}^i|}{V_{t,d}^i}\right)\right] \times (1 + Zerovol_{i,t}) \quad (6)$$

$$Zerovol_{i,t} = \frac{number\ of\ days\ with\ zero\ trading\ volume}{T} \quad (7)$$

Table 3: Basic Statistics

Panel A: Risk Premium Factors

	Average	S.D.	25th	50th	75th	Max	Min
Rm	0.2738	6.3987	-2.6643	0.8545	3.9789	13.3014	-19.4577
SMB	0.7913	4.7240	-1.7794	0.7515	3.2451	14.2012	-10.3178
HML	0.7047	3.7168	-1.3800	0.6307	3.0486	9.1177	-8.8338
MOM	17.4497	4.8632	14.1515	16.2519	19.5191	34.7012	10.5040
Sen	0.2121	1.5133	-0.3794	0.0464	0.5788	6.1279	-3.1030
VOL	0.2360	2.6490	-0.5560	-0.1000	0.4780	9.7160	-3.2950
$Illiq$	-4.1624	1.1222	-4.9689	-4.1976	-3.5829	-1.6513	-6.1403
CSK	0.0025	0.0419	-0.0219	0.0020	0.0284	0.0976	-0.1084

Panel B: Full Sample and Portfolio Level

	Average	S.D.	25th	50th	75th	Max	Min
Full	0.4226	5.9194	-2.6408	0.9840	4.0696	13.6640	-16.3338
P1 (Worst)	-1.9914	6.0753	-4.5971	-0.9982	1.6114	11.9136	-19.5739
P2	-0.0052	6.0740	-2.9220	0.5699	3.6725	13.2688	-17.0715
P3	0.6737	6.0505	-2.3839	1.1892	4.1205	13.7886	-16.4288
P4	1.3117	5.9615	-1.6026	1.6465	4.7663	14.3548	-14.3690
P5 (Best)	2.7171	5.6666	-0.3227	2.7185	5.8965	15.5425	-13.5803
P6 (P5-P1)	4.7085	2.0986	3.3185	4.2381	5.5611	11.2645	1.8247

Panel C: Bank-Related (BR) Funds

	Average	S.D.	25th	50th	75th	Max	Min
Full	0.4780	5.8739	-2.3736	0.8711	4.1080	13.3089	-17.5015
BR1 (Worst)	-1.7892	6.0257	-4.5424	-0.9162	1.7272	11.2345	-20.2176
BR2	-0.1275	5.9863	-2.9653	0.3869	3.3232	12.1738	-17.2781
BR3	0.6869	5.9645	-2.1959	1.0854	4.1600	13.9304	-16.8550
BR4	1.4740	5.9120	-1.4003	1.5556	4.6994	14.5043	-16.5364
BR5 (Best)	2.8591	5.7399	-0.3112	2.7460	5.9078	15.8306	-13.3651
BR6 (BR5-BR1)	4.6483	2.0523	3.3136	4.1970	5.4344	11.4111	1.9976

Panel D: Nonbank-Related (NBR) Funds

	Average	S.D.	25th	50th	75th	Max	Min
Full	0.3609	6.0088	-2.6120	1.0185	3.9129	13.9055	-15.5865
NBR1 (Worst)	-1.5279	6.2115	-4.0721	-0.5665	2.0018	12.9855	-18.6784
NBR2	0.1364	6.1424	-2.7099	0.7628	3.7110	13.3422	-16.8467
NBR3	0.6807	6.1330	-2.4497	1.2307	4.2420	13.7347	-15.2052
NBR4	1.2045	6.0664	-1.8300	1.5652	4.6054	14.2931	-14.4976
NBR5 (Best)	2.3096	5.6505	-0.8023	2.3727	5.6222	15.2529	-13.8778
NBR6 (NBR5-NBR1)	3.8375	2.1273	2.4312	3.3025	4.6551	12.1650	1.1409

Panel E: Test of Equality in Average Mean Returns between Bank-Related and Nonbank-Related Mutual Funds

	BR Fund	NBR Fund	p-value
Full	0.0048	0.0036	0.0724
P1 (Worst)	-0.0179	-0.0153	0.0267
P2	-0.0013	0.0014	0.0000
P3	0.0069	0.0068	0.9111
P4	0.0147	0.0120	0.0000
P5 (Best)	0.0286	0.0231	0.0000

Panels A to D present basic characteristics of risk premium factors, full sample and portfolio levels, bank-related mutual funds, and nonbank-related mutual funds, respectively. Panel E presents difference in mean returns between bank-related and nonbank-related funds. Rm is the market excess return. SMB, HML, and MOM are mimicking portfolios on size, book-to-market, and momentum factors, respectively. Sen is difference between the investor sentiment index and its mean. VOL is the realized volatility estimated from the GARCH (1,1) model specification. $Illiq$ is the adjusted Amihud liquidity premium and CSK is the coskewness risk factor. All numbers are in the percentage form.

where $Zerovol_{i,t}$ refers to the percentage of no trading activity day of stock i in month t. T is the number of total trading days. $R^i_{t,d}$ and $V^i_{t,d}$ are return and trading volume of stock i on day d in month t. ln and $|\ |$ denote natural logarithm and absolute value, respectively.

Cao et al. (2013) propose the liquidity timing ability model as follows.

$$r_{p,t+1} = \alpha_p + \beta_p Rm_{t+1} + \beta_{p,SMB} SMB_{t+1} + \beta_{p,HML} HML_{t+1} + \beta_{p,MOM} MOM_{t+1} + \gamma_p Rm_{t+1}\left(L_{m,t+1} - \bar{L}_m\right) + \upsilon_{p,t+1} \quad (8)$$

where $L_{m,t+1}$ is the market-wide liquidity in month $t+1$ and $\bar{L}_m$ is a time-series average market-wide liquidity over the $[t-60, t-1]$ rolling window period. γ_p represents market-wide liquidity timing ability of mutual

fund managers. A significant positive γ_p demonstrates the market-wide liquidity timing ability. A mutual fund manager increases (decreases) the exposure of portfolio to the market exposure given a mutual fund's holding of illiquid (liquid) assets.

3.2.5. Coskewness Risk Factor

Motivated by the study of Wattantorn et al. (2020), coskewness risk factor is created in order to capture an asymmetry in return, which is found more often in emerging markets. We follow the methodology suggested by Harvey and Siddique to define the coskewness factor of stock i (S_i) as follows.

$$S_i = \frac{E(\varepsilon_{i,t+1}\varepsilon_{m,t+1}^2)}{\sqrt{E(\varepsilon_{i,t+1}^2)}E(\varepsilon_{m,t+1}^2)} \quad (9)$$

where $\varepsilon_{i,t+1}$ is the residual term of stock i in month $t+1$, which is obtained from the market model. $\varepsilon_{m,t+1}^2$ is the squared residual term of the market in month $t+1$, which is obtained from the regression model of the market excess return on its time-series mean. Following the construction by Harvey and Sidiqque (2000), the first 60 months of the period of study are used to compute $\varepsilon_{i,t+1}^2$ and $\varepsilon_{m,t+1}^2$. Then, we obtain S_i in each month and rank it on the monthly basis. In a given month, the most 30% negative S_i is formed to be a value-weighted portfolio named as S^- while the most 30% positive S_i is named as S^+. The coskewness risk factor (CSK) is defined as the return spread of the portfolios S^- and S^+.

4. Results and Discussion

4.1. An Investor Sentiment Timing Ability Model

To investigate the ability to time investor sentiment of mutual fund managers, we start our analysis by employing the model proposed by Zheng et al. (2019) as

$$r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \sum_{i=1}^{4}\beta_{i,p}f_{i,t} + \nu_{p,t} \quad (10)$$

where $r_{p,t}$ and Rm_t are the equally weighted mutual fund's excess return on fund p and the market excess return during month t, respectively. $Sen_{m,t}$ and $\overline{Sen_m}$ are changes in the aggregate investor sentiment index during month t and the simple time series average of changes in the aggregate sentiment over the 60 period rolling window respectively. $f_{i,t}$ is the portfolio's return on factor i, which is the market excess return, size premium (SMB), value premium (HML), and momentum trading strategy (MOM) during month t. We follow the methodologies suggested by Fama and French (1992) for the constructions of SMB and HML and Jagandeeh and Titman (1993) for the construction of momentum factor as shown in the prior section. $\nu_{p,t}$ is the error term of portfolio p during month t.

Table 4 shows the results obtained from equation (1) for the full sample and quintile equally weighted portfolios, where P1 represents the worst-performing mutual fund portfolios and P5 is the best-performing portfolios. P6 is the zero-trading strategy by simultaneously shorting P1 and purchasing P5. Each equally weighted quintile portfolios are calculated based on trailing 12-month returns and assumed to hold for a month, then rebalanced every month. Dead funds are included in a portfolio till they disappear, thus the data sample is free of survivorship bias.

Different from the evidence in the U.S. found by Zheng et al. (2019) on the dominant role of sentiment hedger behavior of mutual fund managers, our findings show that mutual fund managers of Thailand are, in general, not able to time aggregate investor sentiment as shown in Table 4. Comparing to the finding of Zheng et al. (2019), we find that mutual funds of Thailand perform better than those of the U.S., which they generate positive risk adjusted abnormal returns at full sample. Although we cannot find the investor sentiment timing ability at full sample, we still find positive and significant coefficients of investor sentiment timing ability among high performing mutual fund portfolios (P3, P4, and P5), representing sentiment chasing behavior. On the other hand, we find the negative coefficient, albeit statistically insignificant, of the worst performing fund (P1), implying that the bottom fund managers are potentially to be sentiment hedgers attempting to reduce the portfolio's exposure given a high level of investor sentiment. The other risk premium factors ($Rm, SMB, HML,$ and MOM) perform relatively well in the full sample as well as in the portfolio level. As expected, the best performer generates an extra return, while the others do not. Even though the abnormal return of the zero-cost trading portfolio (P6) is not significant, albeit positive, yielding 0.0026% per month, it presents economic significance to investors. In general, the baseline models are well specified, showing large values of adjusted R-squared values.

4.2. An Investor Sentiment Timing Ability Model with Coskewness Risk Factor

Wattanatorn et al. (2020) discuss an importance of coskewness risk factor in models of mutual fund

performance as the return distribution in emerging markets is normally skewed larger than in developed countries. Thus, mutual fund managers should not ignore. After taking this into consideration, we suggest our model as

$$r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \delta_{p,csk} CSK_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \nu_{p,t} \quad (11)$$

where CSK_t is the coskewness risk factor during month t, following the construction suggested by Harvey and Sid ique (2000) as shown in the prior section.

Table 4: Tests of Investor Sentiment Timing Ability

	Full	P1 (Worst)	P2	P3	P4	P5 (Best)	P6 (P5-P1)
Constant	-0.0001	-0.0003	-0.0010	-0.0007	0.0002	0.0023**	0.0026
	(-0.08)	(-0.18)	(-0.62)	(-0.86)	(0.22)	(1.96)	(1.34)
Rm	0.8910***	0.8660***	0.9170***	0.9190***	0.9130***	0.8450***	-0.0200
	(96.26)	(75.08)	(126.50)	(108.19)	(99.03)	(41.21)	(-1.41)
SMB	0.0162*	0.0240	0.0181*	0.0047	-0.0014	0.0243**	0.0003
	(1.68)	(1.43)	(1.83)	(0.46)	(-0.13)	(2.37)	(0.02)
HML	-0.0322***	-0.0188	-0.0293***	-0.0428***	-0.0441***	-0.0241	-0.0054
	(-3.98)	(-1.23)	(-3.46)	(-4.35)	(-4.00)	(-1.35)	(-0.19)
MOM	0.0101	-0.1340***	-0.0119*	0.0285***	0.0622***	0.1300***	0.2630***
	(1.20)	(-7.77)	(-1.75)	(4.79)	(11.37)	(16.02)	(17.67)
SEN	0.0004	-0.0006	0.0002	0.0007*	0.0009*	0.0010*	0.0017***
	(1.05)	(-1.50)	(0.65)	(1.66)	(1.70)	(1.93)	(2.80)
R^2	97.20%	92.50%	97.40%	97.50%	97.40%	94.70%	32.30%

This table presents the estimated coefficients of $r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \nu_{p,t}$, where $r_{p,t}$ and Rm_t are the monthly equally weighted return on portfolio p in excess of the one-month treasury bill return and the market return in excess of the one-month treasury bill return, respectively. $Sen_{m,t}$ and $\overline{Sen_m}$ are the first difference in the monthly investor sentiment indexes and its 60-period rolling-widow simple average. SEN is a proxy of the investor sentiment timing ability. $f_{i,t}$ denotes the monthly portfolio returns on size (SMB), book-to-market (HML), and momentum (MOM), respectively. $\nu_{p,t}$ is the error term during month t. P1 to P5 are quintile portfolios, which P1 is the lowest performing mutual fund portfolio and P5 is the largest performing mutual fund portfolio. P6 is the zero-cost portfolio, which is the difference between P5 and P1. R^2 is the adjusted R-squared value. Newey and West (1987) *t*-statistics are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5: Tests of Investor Sentiment Timing Ability with Coskewness Risk Factor.

	Full	P1 (Worst)	P2	P3	P4	P5 (Best)	P6 (P5-P1)
Constant	-0.0001	-0.0006	-0.0010	-0.0006	0.0003	0.0025**	0.0031*
	(-0.09)	(-0.37)	(-0.64)	(-0.78)	(0.42)	(2.16)	(1.84)
Rm	0.8910***	0.8650***	0.9170***	0.9190***	0.9130***	0.8460***	-0.0192
	(92.92)	(69.88)	(123.15)	(107.11)	(97.99)	(42.72)	(-1.52)
SMB	0.0204**	0.0434***	0.0210***	0.0066	-0.0014	0.0097	-0.0337*
	(2.26)	(2.63)	(2.59)	(0.71)	(-0.14)	(0.84)	(-1.79)
HML	-0.0284***	-0.0017	-0.0267***	-0.0409***	-0.0437***	-0.0372**	-0.0355
	(-3.57)	(-0.13)	(-3.22)	(-4.40)	(-4.69)	(-2.39)	(-1.55)
MOM	0.0101	-0.1330***	-0.0117*	0.0283***	0.0616***	0.1290***	0.2620***
	(1.23)	(-7.77)	(-1.71)	(4.95)	(12.30)	(15.80)	(17.72)
SEN	0.0003	-0.0010***	0.0001	0.0006	0.0009	0.0013**	0.0023***
	(0.78)	(-2.63)	(0.43)	(1.38)	(1.50)	(2.09)	(3.35)
CSK	-0.0086	-0.0380***	-0.0058	-0.0042	-0.0009	0.0291**	0.0671***
	(-1.16)	(-3.72)	(-0.72)	(-0.48)	(-0.09)	(2.56)	(3.84)
R^2	97.20%	92.60%	97.40%	97.50%	97.40%	94.80%	33.60%

This table presents the estimated coefficients of $r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \delta_{p,csk} CSK_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \nu_{p,t}$, where $r_{p,t}$ and Rm_t are the monthly equally weighted return on portfolio p in excess of the one-month treasury bill return and the market return in excess of the one-month treasury bill return, respectively. $Sen_{m,t}$ and $\overline{Sen_m}$ are the first difference in the monthly investor sentiment indexes and its 60-period rolling-widow simple average. SEN is a proxy of the investor sentiment timing ability. CSK_t is the monthly coskewness risk factor suggested by Harvey and Siddque (2000). $f_{i,t}$ denotes the monthly portfolio returns on size (SMB), book-to-market (HML), and momentum (MOM), respectively.

$v_{p,t}$ is the error term during month t. P1 to P5 are quintile portfolios, which P1 is the lowest performing mutual fund portfolio and P5 is the largest performing mutual fund portfolio. P6 is the zero-cost portfolio, which is the difference between P5 and P1. R^2 is the adjusted R-squared value. Newey and West (1987) *t*-statistics are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Interestingly, the coskewness risk factor as an additional variable helps distinguish behaviors of mutual fund managers. Top fund managers (P5) act as investor sentiment chasers showing the significantly positive coefficient of investor timing ability factor whereas bottom fund managers are investor sentiment hedgers showing the significantly negative coefficient. These are in line with the statistical significance of coskewness risk factor, emphasizing an important role of higher-order comment in portfolio's allocations and performances in emerging markets. Non-extreme mutual fund portfolios do not possess statistically significant investor sentiment timing ability factors, albeit positive in sign. The remaining findings are generally the same as shown in Table 4.

4.3. An Investor Sentiment Timing Ability Model with Market Sentiment Factor

Since aggregate investor sentiment plays an important role on asset pricing, it is logical to include a potential effect of the aggregate investor sentiment in the model as suggested by several studies (Baker & Wurgler, 2006, 2007; Yu & Yuan, 2011; Stambaugh et al., 2012). To ensure that our results are not biased because of an omission of this variable, we propose the following model as

$$r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \delta_{p,CSK} CSK_t + \delta_{p,Sen} Sen_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + v_{p,t} \quad (12)$$

The results shown in Table 4 qualitatively remain the sa me as in previous sections that we find the significantly neg ative (positive) sentiment timing ability factor for losers (wi nners). These are consistent with the signs of investor senti ment index factor, highlighting an important role of aggrega te investor sentiment in mutual fund performance. The other findings remain the same as in previous sections.

4.4. An Investor Sentiment Timing Ability Model with Market Timing Ability, Volatility Timing Ability, and Liquidity Timing Ability

Taking various timing abilities of mutual fund managers found in prior literature into consideration and ascertaining that the results are not driven by other well-known timing abilities, we incorporate the market timing ability, volatility timing ability, and liquidity timing ability suggested by Treynor and Mazuy (1966), Busse (1999), and Cao et al. (2013), respectively, into the model as

$$r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \delta_{p,CSK} CSK_{m,t} + \delta_{p,Sen} Sen_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \sum_{j=3}^{3} \beta_{j,p} h_{j,t} + v_{p,t} \quad (13)$$

where $h_{j,t}$ is the timing ability factor j of mutual fund managers, which is the market timing ability (Rm_t^2), the volatility timing ability $\left(Rm_t(\sigma_{m,t} - \bar{\sigma}_m)\right)$, and the liquidity timing ability $\left(Rm_t(L_{m,t} - \bar{L}_m)\right)$. The construction of each variable is defined in the prior sections.

Both for the full sample and quintile portfolios, the investor sentiment timing ability of fund managers seems to disappear after controlling for the other well-known market timing abilities. However, signs of the investor sentiment coefficient are positive for the top-performing funds and negative for the worst-performing funds, albeit statistically insignificant. Interesting, fund managers of high-performing funds possess the market return timing ability, volatility timing ability, and liquidity timing ability. Fund managers increase the exposure of the investment portfolio when market return and market–wide liquidity are high, and decrease the exposure when the market volatility is low. Our findings on these three abilities are consistent to the findings of Wattanatorn and Padungsaksawasdi (2020). The remaining evidence are largely the same as shown in prior sections. We conclude that mutual fund managers of high-performing funds show abilities to time non-behavioral stock market characteristics; that is, market return, market volatility, and market-wide liquidity, but no ability to time the aggregate investor sentiment.

4.5. Bank-related and Nonbank-related Mutual Funds

The structure of the mutual fund industry in Thailand gives us an opportunity to explore the relationship between bank-related mutual funds and nonbank-related mutual funds, which has gained little attention in prior literature. Berzins et al. (2013), Hao and Yan (2012), Massa and Rehman (2008), and Mehran and Stulz (2007) suggest that bank-related mutual funds occupy a superiority of available

Table 6: Tests of Investor Sentiment Timing Ability with Coskewness Risk Factor and Investor Sentiment Index.

	Full	P1 (Worst)	P2	P3	P4	P5 (Best)	P6 (P5-P1)
Constant	0.0006	0.0008	-0.0005	-0.0002	0.0009	0.0023**	0.0015
	(0.92)	(0.56)	(-0.26)	(-0.16)	(1.15)	(2.13)	(0.91)
Rm	0.8940***	0.8710***	0.9190***	0.9210***	0.9150***	0.8450***	-0.0258*
	(97.67)	(74.39)	(122.23)	(104.36)	(96.18)	(44.44)	(-1.86)
SMB	0.0239**	0.0507***	0.0237***	0.0090	0.0015	0.0087	-0.0420*
	(2.36)	(2.87)	(2.73)	(0.91)	(0.13)	(0.71)	(-1.95)
HML	-0.0289***	-0.0027	-0.0270***	-0.0413***	-0.0441***	-0.0371**	-0.0344
	(-3.74)	(-0.18)	(-3.37)	(-4.69)	(-5.07)	(-2.34)	(-1.34)
MOM	0.0119	-0.1290***	-0.0103	0.0296***	0.0631***	0.1280***	0.2570***
	(1.55)	(-8.63)	(-1.55)	(5.24)	(12.16)	(14.35)	(20.51)
SEN	0.0004	-0.0008*	0.0002	0.0007	0.0010*	0.0013**	0.0021***
	(0.96)	(-1.80)	(0.58)	(1.54)	(1.70)	(2.13)	(3.00)
CSK	-0.0088	-0.0385***	-0.0060	-0.0044	-0.0011	0.0291**	0.0677***
	(-1.13)	(-3.61)	(-0.74)	(-0.49)	(-0.11)	(2.56)	(3.91)
Sen	-0.0000*	-0.0001*	-0.0000*	-0.0000**	-0.0000	0.0000	0.0001*
	(-1.82)	(-1.82)	(-1.67)	(-1.99)	(-1.62)	(0.46)	(1.87)
R^2	97.20%	92.60%	97.40%	97.50%	97.40%	94.80%	34.20%

This table presents the estimated coefficients of $r_{p,t} = \alpha_p + \gamma_p Rm_t(Sen_{m,t} - \overline{Sen_m}) + \delta_{p,CSK} CSK_t + \delta_{p,Sen} Sen_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \nu_{p,t}$, where $r_{p,t}$ and Rm_t are the monthly equally weighted return on portfolio p in excess of the one-month treasury bill return and the market return in excess of the one-month treasury bill return, respectively. $Sen_{m,t}$ and $\overline{Sen_m}$ are the first difference in the monthly investor sentiment indexes and its 60-period rolling-widow simple average. SEN is a proxy of the investor sentiment timing ability. CSK_t is the monthly coskewness risk factor suggested by Harvey and Siddque (2000). $f_{i,t}$ denotes the monthly portfolio returns on size (SMB), book-to-market (HML), and momentum (MOM), respectively. $\nu_{p,t}$ is the error term during month t. P1 to P5 are quintile portfolios, which P1 is the lowest performing mutual fund portfolio and P5 is the largest performing mutual fund portfolio. P6 is the zero-cost portfolio, which is the difference between P5 and P1. R^2 is the adjusted R-squared value. Newey and West (1987) *t*-statistics are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7: Tests of Investor Sentiment Timing Ability with Market Timing Ability, Volatility Timing Ability, and Liquidity Timing Ability.

	Full	P1 (Worst)	P2	P3	P4	P5 (Best)	P6 (P5-P1)
Constant	0.0020*	-0.0057	-0.0018	0.0016	0.0036**	0.0118***	0.0174**
	(1.74)	(-1.29)	(-0.99)	(1.00)	(2.08)	(3.79)	(2.49)
Rm	0.8890***	0.9310***	0.9370***	0.9120***	0.8970***	0.7760***	-0.1540***
	(94.96)	(55.36)	(73.58)	(81.80)	(78.85)	(29.45)	(-3.93)
SMB	0.0264**	0.0393*	0.0218**	0.0128	0.0067	0.0243**	-0.0150
	(2.57)	(1.79)	(2.24)	(1.26)	(0.58)	(2.34)	(-0.59)
HML	-0.0274***	-0.0015	-0.0254***	-0.0400***	-0.0428***	-0.0346**	-0.0331
	(-3.79)	(-0.09)	(-3.36)	(-4.90)	(-5.34)	(-2.45)	(-1.27)
MOM	0.0038	-0.0728*	0.0036	0.0182	0.0432***	0.0531***	0.1260**
	(0.29)	(-1.65)	(0.24)	(1.56)	(4.04)	(3.23)	(2.24)
SEN	0.0002	-0.0008	0.0000	0.0005	0.0007	0.0006	0.0013
	(0.45)	(-1.49)	(0.16)	(1.11)	(1.16)	(0.88)	(1.37)
CSK	-0.0074	-0.0431***	-0.0063	-0.0024	0.0015	0.0359***	0.0791***
	(-0.93)	(-4.95)	(-0.77)	(-0.26)	(0.14)	(3.21)	(5.80)
Sen	-0.0000*	-0.0001**	-0.0000**	-0.0000**	-0.0000	0.0000	0.0001*
	(-1.94)	(-2.06)	(-2.18)	(-2.12)	(-1.58)	(0.60)	(1.94)
MKT	0.1980	-1.7110**	-0.4510	0.3400	0.5690***	2.0810***	3.7930***
	(0.82)	(-2.29)	(-1.19)	(1.58)	(3.46)	(7.95)	(4.22)
VOL	-0.0435***	-0.0285**	-0.0500***	-0.0476***	-0.0438***	-0.0446***	-0.0161
	(-7.37)	(-2.15)	(-7.07)	(-7.09)	(-8.60)	(-6.06)	(-0.89)
LIQ	-0.0027	0.0065	0.0018	0.0009	-0.0030	-0.0242***	-0.0306***
	(-0.69)	(0.90)	(0.36)	(0.20)	(-0.65)	(-6.97)	(-3.44)
R^2	97.30%	92.90%	97.50%	97.60%	97.50%	95.40%	43.00%

This table presents the estimated coefficients of $r_{p,t} = \alpha_p + \gamma_p Rm_t(Sen_{m,t} - \overline{Sen_m}) + \delta_{p,CSK} CSK_{m,t} + \delta_{p,Sen} Sen_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \sum_{j=3}^{3} \beta_{j,p} h_{j,t} + \nu_{p,t}$, where $r_{p,t}$ and Rm_t are the monthly equally weighted return on portfolio p in excess of the one-month treasury bill return and the market return in excess of the one-month treasury bill return, respectively. $Sen_{m,t}$ and $\overline{Sen_m}$ are the first difference in the monthly investor sentiment indexes and its 60-period rolling-widow simple average. CSK_t is the monthly coskewness risk factor suggested by Harvey and Siddque (2000). $f_{i,t}$ denotes the monthly portfolio returns on size (SMB), book-to-market (HML), and momentum (MOM), respectively. SEN is a proxy of the

investor sentiment timing ability. MKT, VOL, and LIQ are the market return timing ability, volatility timing ability, and liquidity timing ability, respectively. $v_{p,t}$ is the error term during month t. P1 to P5 are quintile portfolios, which P1 is the lowest performing mutual fund portfolio and P5 is the largest performing mutual fund portfolio. P6 is the zero-cost portfolio, which is the difference between P5 and P1. R^2 is the adjusted R-squared value. Newey and West (1987) *t*-statistics are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8: Tests of Investor Sentiment Timing Ability of the Bank-Mutual Fund Relationship.

Panel A: Bank-Related Fund

	Full	BR1 (Worst)	BR2	BR3	BR4	BR5 (Best)	BR6 (BR5-BR1)
Constant	0.0031**	-0.0055	0.0005	0.0040*	0.0049**	0.0124***	0.0031**
	(2.47)	(-1.23)	(0.24)	(1.72)	(2.05)	(4.33)	(2.47)
Rm	0.8880***	0.9480***	0.9280***	0.9000***	0.8700***	0.7900***	0.8880***
	(84.12)	(42.83)	(85.75)	(82.80)	(68.88)	(33.47)	(84.12)
SMB	0.0136	0.0435**	0.0076	-0.0046	-0.0057	0.0119	0.0136
	(1.61)	(2.48)	(1.12)	(-0.52)	(-0.47)	(0.83)	(1.61)
HML	-0.0323***	0.0139	-0.0296***	-0.0459***	-0.0621***	-0.0509***	-0.0323***
	(-4.41)	(1.13)	(-3.58)	(-5.93)	(-6.21)	(-2.68)	(-4.41)
MOM	0.0019	-0.0595	-0.0110	0.0048	0.0370***	0.0581***	0.0019
	(0.14)	(-1.36)	(-0.82)	(0.38)	(3.24)	(4.20)	(0.14)
SEN	-0.0001	-0.0012**	-0.0004*	0.0001	0.0004	0.0003	-0.0001
	(-0.47)	(-2.48)	(-1.78)	(0.32)	(0.69)	(0.39)	(-0.47)
CSK	-0.0064	-0.0575***	-0.0086	-0.0002	0.0075	0.0403***	-0.0064
	(-0.94)	(-7.35)	(-1.24)	(-0.03)	(0.77)	(4.06)	(-0.94)
Sen	-0.0000*	-0.0001***	-0.0000*	-0.0000	-0.0000	-0.0000	-0.0000*
	(-1.91)	(-2.67)	(-1.93)	(-1.43)	(-1.25)	(-0.32)	(-1.91)
MKT	-0.0066	-2.0550***	-0.6990**	0.1700	0.9560***	1.9600***	-0.0066
	(-0.02)	(-2.74)	(-1.98)	(0.67)	(5.42)	(8.31)	(-0.02)
VOL	-0.0449***	-0.0393***	-0.0594***	-0.0474***	-0.0346***	-0.0421***	-0.0449***
	(-9.73)	(-4.34)	(-10.51)	(-9.41)	(-6.78)	(-3.84)	(-9.73)
LIQ	0.0124***	0.0012	0.0017	0.0070	0.0133***	0.0369***	0.0124***
	(3.95)	(0.20)	(0.34)	(1.53)	(3.08)	(6.47)	(3.95)
R^2	97.50%	94.40%	97.60%	97.60%	97.30%	94.70%	97.50%

Panel B: Nonbank-Related Fund

	Full	NBR1 (Worst)	NBR2	NBR3	NBR4	NBR5 (Best)	NBR6 (NBR5-NBR1)
Constant	-0.0001	-0.0061	-0.0054***	-0.0014	0.0014	0.0100***	0.0160**
	(-0.09)	(-1.46)	(-3.25)	(-0.96)	(1.04)	(3.27)	(2.57)
Rm	0.8920***	0.9050***	0.9430***	0.9390***	0.9280***	0.7660***	-0.1390***
	(77.78)	(61.01)	(66.73)	(65.01)	(66.80)	(27.81)	(-3.63)
SMB	0.0463***	0.0358	0.0409***	0.0363***	0.0348***	0.0455***	0.0097
	(3.37)	(1.19)	(3.72)	(3.00)	(2.77)	(4.09)	(0.37)
HML	-0.0227**	-0.0173	-0.0187**	-0.0290***	-0.0255***	-0.0126	0.0047
	(-1.97)	(-0.60)	(-2.22)	(-2.82)	(-2.59)	(-1.05)	(0.18)
MOM	0.0095	-0.0590	0.0283**	0.0386***	0.0503***	0.0454**	0.1040*
	(0.71)	(-1.43)	(1.96)	(3.14)	(4.22)	(2.27)	(1.92)
SEN	0.0007	0.0002	0.0007*	0.0009	0.0013*	0.0012	0.0010
	(1.28)	(0.41)	(1.71)	(1.59)	(1.73)	(1.56)	(1.07)
CSK	-0.0090	-0.0123	-0.0037	-0.0070	-0.0024	0.0250*	0.0373**
	(-0.89)	(-1.21)	(-0.32)	(-0.58)	(-0.21)	(1.77)	(2.56)
Sen	-0.0000*	-0.0001	-0.0000**	-0.0000***	-0.0000	0.0000*	0.0001
	(-1.95)	(-1.29)	(-2.01)	(-3.60)	(-1.15)	(1.76)	(1.49)
MKT	0.4510**	-0.7680	-0.0433	0.2110	0.2970	2.1530***	2.9210***
	(2.05)	(-1.01)	(-0.13)	(1.13)	(1.43)	(8.22)	(3.39)
VOL	-0.0420***	-0.0060	-0.0375***	-0.0490***	-0.0525***	-0.0564***	-0.0504***
	(-4.60)	(-0.33)	(-3.84)	(-4.80)	(-7.55)	(-9.62)	(-2.81)
LIQ	0.0122*	0.0249*	0.0070	0.0036	0.0073	0.0026	-0.0224*
	(1.93)	(1.88)	(1.20)	(0.61)	(1.30)	(0.72)	(-1.74)
R^2	96.00%	89.30%	96.70%	96.50%	96.60%	95.20%	29.30%

This table presents the estimated coefficients of $r_{p,t} = \alpha_p + \gamma_p Rm_t\left(Sen_{m,t} - \overline{Sen_m}\right) + \delta_{p,CSK} CSK_{m,t} + \delta_{p,Sen} Sen_t + \sum_{i=1}^{4} \beta_{i,p} f_{i,t} + \sum_{j=3}^{3} \beta_{j,p} h_{j,t} +$

$v_{p,t}$, where $r_{p,t}$ and Rm_t are the monthly equally weighted return on portfolio p in excess of the one-month treasury bill return and the market return in excess of the one-month treasury bill return, respectively. $Sen_{m,t}$ and $\overline{Sen_m}$ are the first difference in the monthly investor sentiment indexes and its 60-period rolling-widow simple average. CSK_t is the monthly coskewness risk factor suggested by Harvey and Siddque (2000). $f_{i,t}$ denotes the monthly portfolio returns on size (SMB), book-to-market (HML), and momentum (MOM), respectively. SEN is a proxy of the investor sentiment timing ability. MKT, VOL, and LIQ are the market return timing ability, volatility timing ability, and liquidity timing ability, respectively. $v_{p,t}$ is the error term during month t. P1 to P5 are quintile portfolios, which P1 is the lowest performing mutual fund portfolio and P5 is the largest performing mutual fund portfolio. P6 is the zero-cost portfolio, which is the difference between P5 and P1. R^2 is the adjusted R-squared value. Panels A and B show the results of bank-related (BR) and nonbank-related (NBR) mutual funds, respectively. Newey and West (1987) *t*-statistics are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

firm-specific information obtained from the bank. For example, a bank-related mutual fund may receive firm-specific information (IPO information, IPO demand, financial need, and future investment project) from its parent's bank that helps the mutual fund understand the expectations of business owners. In Thailand, businesses of commercial banks cover a wide range of activities, acting as universal banking, thus bank-related funds can truly benefit from unique information of the mother bank' clients. Furthermore, investors prefer doing businesses to banks due to a low searching cost (Sirri & Tufano, 1998), bank-related fund managers are able to observe and learn flows of clients' transactions through their bank affiliated activities. This is later supported by Mooney (2000) and Hwang (2019), who emphasize informational advantages of bank-related mutual funds. As information on IPO activity, firms' financing transactions and trading turnovers are parts of the investor sentiment index, we propose that bank-related fund managers can exploit this benefit to trade on a movement in market-wide investor sentiment. We follow the classification between bank-related mutual funds and nonbank-related mutual funds suggested by Wattanatorn et al. (2020).

Panels A and B of Table 8 report the results of investor sentiment timing ability for bank-related (BR) and nonbank-related (NBR) mutual funds, respectively, employing the regression model in equation (4). Overall, we do not find the investor sentiment timing ability at the aggregate level for both groups. However, we find that the worst-performing bank-related mutual funds (BR1) demonstrate an ability to time investor sentiment. Fund managers increase (decrease) the exposure of the investment portfolio when the market sentiment is low (high), acting as sentiment hedgers. On the other side, we cannot find an ability to time investor sentiment for nonbank-related mutual funds even for the worst-performing portfolio. However, we find that the high-performing nonbank-related (NBR4) portfolio managers exhibit the investor sentiment chasing behavior. Moreover, managers of bank-related funds possess better market timing ability and liquidity timing ability that those of nonbank-related funds. This is consistent to superior abnormal returns of bank-related funds to nonbank-related funds in all portfolios. In summary, our findings support the informational advantage hypothesis in that bank-related funds gain informational superiority to nonbank-related funds.

4.6. Possible Explanations

In this section we propose few explanations that mutual fund managers in Thailand are generally not able to time market-wide investor sentiment. First, the mutual fund industry in Thailand is much less competitive comparing that in developed markets as documented by Ferreira and Ramos (2009). They show that the Herfindahl-Hirschman index of the mutual fund industry in Thailand is 0.103, which is higher than that of the global average mutual fund industry (0.087) and that of the mutual fund industry in the U.S. (0.015). The concentration of the Thai mutual fund industry is approximately 18% greater than that in the U.S. mutual fund industry, showing a less competitive level. This evidence is reconfirmed by the fact that the number of mutual funds in Thailand is much less than that of mutual funds in the U.S. Thus, the mutual fund managers of Thailand are not well incentivized to generate large profits comparing to their peers. Second, the mutual fund managers focus on traditional timing abilities on fundamental stock characteristics more than a behavioral factor as market returns in emerging markets are more easily predicted than in developed markets (Bekaert & Harvey, 1997). Last, financial literacy in Thailand is still relatively low comparing to in developed markets. Klapper and Lusardi (*In Press*) show that an average level of financial literacy rate in advanced countries is 55%, while that of financial literacy in Thailand is approximately 27%. Retail investors with less financial knowledge are more likely to put less pressure to mutual fund managers. Thus, the mutual fund managers are discouraged to strive in the industry. Traditional or basic timing abilities seem to be sufficient to survive in the industry.

5. Conclusions

We revisit the market-wide investor sentiment timing ability of mutual fund managers in an emerging market. Contradicting to the findings in the U.S. market, only worst-performing mutual fund managers are able to time the investor sentiment and successfully hedge investor

sentiment. While the best-performing mutual fund manager behave as sentiment chasers. After controlling for the coskewness risk (non-normal distribution) factor and the investor sentiment index, the results remain the same that fund managers do not generally possess the investor sentiment timing ability. Likewise, an inclusion of the market return ability, the volatility timing ability, and the liquidity timing ability does not change the results on inability to time investor sentiment. Specifically, we find evidence on the sentiment timing ability among worst-performing bank-related funds, which behave as sentiment hedgers. They increase the portfolio's exposure when investor sentiment drops. An advantage of gaining information from their bank's client is a key success. The competition in the mutual fund industry, the ability to predict fundamentals, and financial knowledge are possible reasons to explain the main findings in this study.

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Appendixes

Appendix 1: Summarize the Theoritical Background on Investor Sentiment

Author	Research Question	Sample	Finding
Baker and Wurgler (2006)	How investor sentiment affects the cross-section of stock returns	U.S. equity market between 1962-2001	Investor sentiment has an important effect on cross-sectional stock return. To be more specific, investor sentiment is one of important systematic risk factor.
Yu and Yuan (2011)	The effect of investor sentiment on how rational investor make an investment decision.	U.S. equity market between 1963-2004	The security premiums have a positive relationship with market's variance in low sentiment period but has a no relationship with market's variance in high sentiment period. They further show that sentiment effects the risk and return trade-off and, then, effects the price level respectively.
Stambaugh, Yu, and Yuan (2012)	The role of investor sentiment on the effect of market anomalies (financial distress, net stock issues, composite equity issues, total accruals, net operating assets, momentum, gross profit-to-assets, asset growth, return-on-assets (ROA), and investment-to-assets)	U.S. equity market between 1965-2008	The market mispricing due to market anomalies is stronger during high investor sentiment.
Baker, Wurgler, and Yuan (2012)	How global and local investor sentiment affect the stock return.	Canada, France, Germany, Japan, U.K., and U.S equity market between 1980 and 2005	They found that both global and local investor sentiments affect stock return. Like the prior finding, they found that the stock returns are low during high investor sentiment index—both global and local investor sentiment. Moreover, they provide an evidence to indicate an ability to contagious of global sentiment.
Thubdimphun, Sripinit, and Punjataewakupt (2015)	They aim to construct the investor sentiment index for Thailand and study the impact of Thai investor sentiment index on the stock return in Thai market.	Thailand equity market between 2004 and 2014	They construct the investor sentiment index for Thai market and find that it has a relationship with both stock return and volatility.
Zheng, Osmer, and Zheng (2019)	The authors explore an ability of mutual fund manager to time investor sentiment.	U.S. mutual fund (equity fund) between 1980 and 2013	The study provided evidence to support an ability to time investor sentiment mutual fund managers. Further, with investor sentiment timing skill, mutual funds in the top sentiment timing portfolio outperform those in the bottom sentiment timing portfolio by 3% per annual.