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Developing Investor Sentiment Index for Thailand

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Final Report:

Developing Investor Sentiment Index for Thailand*

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Abstract

Investor sentiment plays an important role in the stock market. Nevertheless, research on measuring investor sentiment, particularly in emerging markets, has been lacking. The purpose of this paper is to develop a market-based investor sentiment index for the Stock Exchange of Thailand (SET) by applying methodology in Baker and Wurgler (2006). Proxies are adjusted so that they fit with Thailand's data and economic conditions. The developed investor sentiment index can indicate major swings in market sentiment and has a stronger predictive power over returns on mai market than over returns on SET. This result coincides with the theory. Small stocks are more prone to investor sentiment than large stocks. In addition, the developed investor sentiment index can capture some major events which drive sentiment trading and their associated price movement. Sentiment cycles, on the upsides tend to last 6-8 months while on the downsides are a bit shorter, only 3-4 months. Excessive sentiment, as indicated by a sentiment index that deviates substantially from normal levels, tends to lead to abrupt corrections. Evidence of prolonged excessive sentiment and the associated risks of larger corrections raised policy questions: when and how should policymakers temper excessive sentiment? or are most sentiment cycles self-correcting and do not warrant intervention?

*Preliminary, please do not quote. The views expressed herein are those of the authors and do not necessarily reflect the views of the institutions.

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1 Introduction

The Stock Exchange of Thailand (SET) is turning 40 this year. Throughout the decades it has enjoyed booms and weathered busts such as the Asian crisis (1997), the Lehman crisis (2008), flood (2011) and the QE tapering tantrum (2013). During the recent domestic political unrest, SET proved resilient partly due to the diversity of its investor base: foreign, retail and institutional investors as well as proprietary traders. Retail investors, in particular, dominate the market with 60% of total trading value. During the past seven years, following the Lehman crisis in U.S. and domestic political uncertainty in 2008, SET index rallied from 384.15 points in October 2008 to 1643.43 points in May 2013 (427%). This extraordinary performance has led to concerns over retail investor exuberance, Thai stock overvaluation and the possibility of an impending crash or correction.

Forward-looking asset markets can be especially sensitive to animal spirits and exuberance. The Stock Exchange of Thailand (SET) positioned itself as a prominent channel for fundraisers and investors in order to create wealth and allocate investments for Thai economy. Nevertheless, investor sentiment can lead to excessive swings and prices that are not in line with fundamentals. According to Baker and Wurgler (2006), investor sentiment is a belief about future cash flows and investment risks that is not justified by the fact at hand. This paper seeks to quantify invest sentiment and its impact on market performance. To this end, we construct an index of investor sentiment in the stock market. Investors, listed firms, and policymakers can thus better monitor market developments.

Investment decisions are based on two important factors; fundamental analysis and investor sentiment. Equity analysts spend most of their time measuring stock value with fundamental information, because it is easier to find and to communicate with other participants in the stock market. However, in reality, actual stock prices frequently deviate from fundamental.

Investor sentiment is frequently cited in the business news or analyst papers. Most investors in the stock market are familiar with the sense that sentiment refers to aggregate investors' opinion and/or emotions. Nevertheless, measuring sentiment is not straightforward. Economists typically view sentiment as a residual left over from fundamentals. As such, its definition remains unclear.

There is no official data series for investor sentiment in SET available yet from neither government organization nor academic research center. Currently, there are at least two approaches to make an investor sentiment index. The first approach is to conduct a direct survey. This approach is widely used in many countries. The disadvantage of this approach is that it is costly and prone to interviewees' bias. The other approach assumes that prices reflect investors' prospective; rational or irrational. Both

in research and practice, there are many market-based indicators used as a signal for investor sentiment. A composite index of market-based indicators as a measure of sentiment (Baker and Wurgler (2006)) would reduce the survey cost and it is also the dominant measure used in many recent studies on investor sentiment.

Capital Market Research Institute (CMRI), member of the Stock exchange of Thailand, is constructing a collection of indices to better gauge market sentiment: CEO survey, and an index of investor sentiment using social media discussions. FETCO is a survey-based index of investor sentiment.

Investor sentiment index, constructed by market based approach is not only the first index of its kind for Thailand, but also for Asia. There are still many challenges for this project. First, the definition and measurement of investor sentiment can be controversial. Previous research on constructing investor sentiment index has focused on developed markets (e.g. United State, United Kingdom, and Japan). The same model and proxies of investor sentiment may be not applicable in emerging markets such as Thailand. Second, data availability and data quality are also big issues.

To construct the leading indicator such as investor sentiment index is very crucial for high volatility market like stock market in emerging countries, because it will give additional information to various kinds of stakeholder. Policy makers are able to get ready for upcoming stock market bubble, issuers could estimate the right moment to raise up their capital, and investors could follow the index and make a good investment decision.

In the nutshell, many of empirical studies have chances to fail, but with good cooperation, excellent research skilled and believe in chosen proxies, working team expect to find the way to capture investor sentiment in Thai stock market and this project will benefit many stakeholders especially as a legacy for subsequent researchers.

2 Objectives

This project is proposed to develop a composite index of investor sentiment in the Stock Exchange of Thailand. The sentiment index developed takes advantage of the methodology suggested by the literatures, signals used in practice as well as Thailand's data availability. Specifically, the objectives of this project are as follows.

1. To adapt the measure of investor sentiment index suggested by literature for Thailand's data
2. To develop the investor sentiment index from SET's database. The developed investor sentiment index would reflect SET investors's attitudes, emotions or viewpoints in each period of time. All

SET investors may utilize information revealed by the developed sentiment index to increase effectiveness of their investment decision.

The investor sentiment index constructed by this project attempts to capture actual investor sentiment. Actual investor sentiment is unobservable. This project will follow the approach which is widely accepted in literature and take the advantage of data availability. However, there are no perfect proxies for investor sentiment. It is difficult or yet impossible to prove that the constructed investor sentiment index is the best.

3 Potential Investor Sentiment Proxies

In this paper, the main objective is to see the applicability and possibility to develop the index by this approach. Thus, the paper considers indicators for sentiment signals suggested by the literature, in particular, Baker and Wurgler (2006). They used six proxies to compute a composite investor sentiment index for the New York Stock Exchange. The composite index computed can capture historical bubbles as crashes during 1961 to 2002. Many recent studies (for example, Antoniou, Doukas, and Subrahmanya, (2013), Hribar and McInnis (2012), Stambaugh, Yu, and Yuan (2012a, 2012b), Baker, Wurgler and Yuan (2012) and Yu and Yuan (2011)) accepted the composite index suggested by Baker and Wurgler (2006) as an appropriate measure for investor sentiment.

We started with 6 proxies of investor sentiment used in Baker and Wurgler (2006) used to construct a composite investor sentiment index for the New York Stock Exchange. The composite index computed can capture historical bubbles as crashes during 1962 to 2002. Those proxies were 1) closed-end fund discount 2) trading volume turnover 3) number of IPOs stock 4) first day return on IPOs 5) share of equity issues in total equity and debt issues 6) dividend premium. Potential 6 proxies from original paper were available in data base of Thai stock market, except the closed-end fund discount, since there wasn't any closed-end fund traded in the secondary market recently. As a result, the price of closed-end fund was not available. Therefore, it is dropped. The remaining 5 proxies are as follows.

1. Trading volume turnover ($LDTURN$) is defined as the ratio of reported share volume to number of share listed in the Stock exchange of Thailand. It reflects the market liquidity, when short-selling is limited. Investor can make profit when the stock prices increase only. Therefore, sentimental investors are likely to trade more when they are optimistic, and the relationship between $TURN$and investor sentiment may be positive. In general, $TURN$ has a positive trend and is likely to be non-

stationary variable. Thus, the first difference and five-year equal weighted moving averaged will be applied to remove the trend and will be referred to as $LDTURN$.

2. Number of IPOs stock ($NIPO$) is the number of IPO stocks traded each month. Insiders and long-run shareholders have strong incentives to issue new stocks when valuations are the greatest. This indicates that sentiment is the highest. However, number of IPOs in the SET is quite different from those in NYSE. The average number of IPO per month in SET is 1.5 while there are about 20 IPOs per month in NYSE.

3. First day return on IPOs ($RIPO$) is a percentage change of stock IPO price to close price at the first day trade. When the sentiment is high, IPOs stock can be traded at a higher price than its IPO price. Return on IPOs is also an ex-post indicator of right market timing for both issuers and investors. Thus, the relationship between $RIPO$ and investor sentiment may be positive.

4. Share of equity issues in total equity and debt issues (S) indicates sentiment in the financial market. High value of equity issues implies a low market return. Business can issue equity stocks with low market return when investors are optimistic. Investor sentiment may be positively related to the share of equity issues in total equity and debt issues.

5. Dividend Premium ($PDND$) is the difference between monthly book value weighted average market to book ratio (M/B ratio) between dividend payer stocks and non-dividend payer stocks. While dividend payer stocks defined as stocks that pay dividend at least one time a year, for the past five years, and market to book ratio is the market capitalization divide by its total asset. Some stocks pay dividends from cash and earnings regularly. Their dividend payout is quite certain. Dividend-paying stocks are close to bond since their income stream is quite predictable. The relative "premium" for dividend-paying stocks, thereafter, indicates investor sentiment. When investors are optimistic, the dividend premium would be low. The dividend premium may be inversely related to sentiment.

We also referred to Corredor's work in 2013, which he applied Baker and Wurgler work with other stock markets outside U.S. such as United Kingdom, France, Germany and Spain. His work indicated that some proxies were available particularly in U.S., so he suggested that the available data for these countries, the variables representing the investor sentiment are: turnover, volatility premium and consumer confidence index (CCI). The first variable are the same as those used in the BW index, however the other two variables can be explained as follows.

- Volatility premium ($VOLP$) is the difference between monthly book value weighted average market

to book ratio (M/B ratio) between high volatility stocks (the top 30%) and low volatility stocks (the bottom 30%). Conceptually, it is similar to that of the dividend premium, which is a proxy for relative investor demand between dividend-paying and non-paying stocks. These two variables are negatively correlated. High volatility stocks tend to be small stocks with low growth potential and dividend non-paying stocks, the demand for which increases with investor sentiment. For countries where dividends are uncommon, the volatility premium is preferred to be used instead of dividend premium.

- Consumer confidence index (CCI) is published by UTCC every month. The Consumer confidence index captures household spending and savings data and investors' perceptions of the economic factors involved. Although, the main advantage of this variable is that extended sets of data and independence of market trading, the result comes from survey based approach and may not appropriate for our model. Last, although we have many proxies to add in to our model, all the previous papers applied to stock markets in developed countries. So, we believe that the Stock exchange of Thailand, which is one of the emerging markets, still needs additional proxies to capture the investor sentiment. The variables that contain investor sentiment in the Stock Exchange of Thailand may be different from those for developed countries in some particular way.

We consider the new investor sentiment proxies that potentially capture investor's sentiment in the Stock Exchange of Thailand. The name of the variables and the reason why we consider them are as follows.

- Retail investor trades is proxy that represent retail investor sentiment. Retail investor is the majority of investor in the Stock Exchange of Thailand (account for 60% of overall trading value, and by nature they are subject to sentiment). However, the proxy of how much retail investors' participation is not clear, we have tried many of variable. The net value (and volume) of net buy of retail investor in each month and the proportion of retail investor trading value (and volume) to total trading value (and volume). The variable $NRET$ is the net buy value of retail investor in each month and the variable *Retail* is the proportion of retail investor trading value to total trading value. The number of new trading accounts open in each month. The variable *Active Rate* is the proxy that indicates the percentage of trading retail investor account in a month to total retail investor account.

- Foreign investor trades is proxy that represent foreign investor sentiment. Foreign investor is known to have significant influence to emerging stock market return. Therefore, adding variable that contain foreign investor sentiment may enhance predictive power to the investor sentiment index.

We have tried many of variables such as value (and volume) of net buy/sell of foreign investor in each month, the proportion of foreign investor trading value (and volume) to total trading value (and volume). $NFIBVAL$ is the proportion of foreign investor net buy value to total trading value. We also interested in insert some index that contains foreign investor sentiment such as risk appetite index, constructed by Credit Suisse. But, at this moment, we don't have this set of data.

- Number of stock in cash balance account is simply the good indicator for bull market, since SET will have system to monitor stocks that have abnormal trading activity to prevent price manipulation. When investor is too optimistic, the number of stock in cash balance account will be high.

- Long-short future contract ratio is normally the number of long contract future to number of long and short contract of SET 50 future by each type of investor. The future market is believed to act more quickly than the spot market, where investors who speculate that the SET index will rise, will long SET 50 future while another side will short. Investor sentiment may be positively related to long-short future contract ratio.

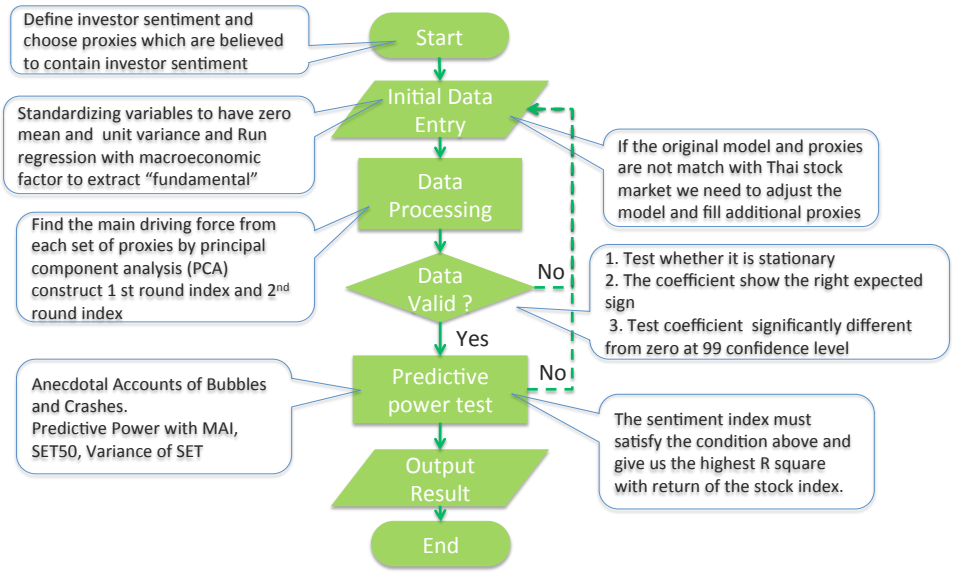
- Trading value turnover is the same concept with trading volume turnover; the only difference is that we use trading value instead of trading volume. This variable is added in order to check whether it can capture investor sentiment better than its volume while the relationship between trading value and investor sentiment is yet expected to be positive.

4 Methodology

By using the methodology suggested in Baker and Wurgler (2006), this paper will calculate many sentiment indices using all possible combinations of potential investor sentiment proxies discussed in the previous section. Many investor sentiment indices will be calculated by using the principal component method. The constructed indices with the sign of each proxy's loading factor is not consistent with the theory will be dropped. After that, this paper will test the candidate investor sentiment index. In addition, the selected investor sentiment index must be consistent with the anecdotal accounts of bubbles and crashes of the stock exchange of Thailand and it should have substantial predictive power with mai, SET50 and variance of SET.

Figure 1 shows the flow chart of the construction and the test of the investor sentiment index. This section will be divided into two parts. The first part is the construction of the investor sentiment

Figure 1: The Construction and The Test of The Investor Sentiment Index



index. The second part will discuss the test of the investor sentiment index.

4.1 Construction of the Investor Sentiment Index

This paper constructs the investor sentiment index by using the principal component method to form a linear index as suggested by Baker and Wurgler (2006). All potential investor sentiment proxies will be used to form a composite sentiment index based on their first principal component. Principal component is a linear combination of variables that explains the maximum proportion of variables' variations. The first principal component technique allows us to consider the most important influences from all the proxies for investor sentiment at the same time. By this way, all proxies for investor sentiment will be concluded in only one composite index. As suggested by Baker and Wurgler (2006), for each combination of investor sentiment proxies, three indices will be constructed : the first stage index, the second stage index and the excess investor sentiment index.

4.1.1 The Two-Step Composite Investor Sentiment Index

Suppose we consider N proxies to construct the investor sentiment index. Different proxies may respond to investor sentiment at different speed. Some lagged proxies may contain the same information on

investor sentiment as the current other proxies. To construct the first stage index (ISI^0), the group of variables includes current proxies and their lags. The group of variables used to estimate the first stage index, therefore, has $2N$ variables. Baker and Wurgler (2006) use current proxies with their one-year lag. In this paper, we consider four choices of lags: 3-month, 6-month, 9-month and 12-month. The model will be estimated for only one choice of lag at a time. For each group of variables, we will estimate four time series of first stage index, each of one choice of lag. The model for estimation is as follows.

$$\begin{aligned} ISI_t^0 &= w_1^0 X_{1,t} + w_{2,}^0 X_{2,t} + ... + w_N^0 X_{N,t} \\ &\quad + w_{N+1}^0 X_{1,t-k} + w_{N+2}^0 X_{2,t-k} + ...w_{2N}^0 X_{N,t-k} \end{aligned} \tag{1}$$

where

$X_{i,t}$ = proxy i at time t, $i = 1, ..., N$

w_j^0 = first principal component loading factor for variable j, and

k = number of months lag. k may take the value; 1, 2, 3 or 6 months, one value for each time estimation.

The expected sign for each principal component loading factor depends on how each proxy is related to investor sentiment. We estimate the model until all loading factors have the correct expected sign as suggested by the theory.

After the first stage index is estimated, we find correlation between the first stage index with each proxy and its selected lag. We then have pairs of each proxy and its lag. For each pair, we will select the proxy or its lag depending on which measure has the higher correlation with the first stage index. We drop the variables with lower correlation with the first stage index, current proxy or its lag. Then, the number of variables used to estimate the second stage index will be reduced to N^*. The estimation model for the two-step composite investor sentiment index (ISI_t^1) is as follows.

$$ISI_t^1 = w_1^1 X_{1,\tau} + w_{2,}^1 X_{2,\tau} + ... + w_N^1 X_{N,\tau} \tag{2}$$

where

$\tau = t$ or $t - k$ depending on which variable has higher correlation with ISI_t^0,

$X_{i,\tau}$ = proxy X_i at time τ, and

w_j^1 = first principal component loading factor for each variable j.

4.1.2 The Excess Investor Sentiment Index

In addition, all proxies for investor sentiment may contain much of systematic risk factors. Systematic risk must be removed from the constructed investor sentiment index so that the sentiment index is orthogonalized to several macroeconomic conditions. The movement of all investor sentiment proxies may be driven by both business cycle component and sentiment. To extract the sentiment part, we remove the business cycle part by regressing each of N current proxies with macroeconomics variables. The regression function is as follows.

$$\begin{aligned} X_{i,t} &= a_0 + a_1 \text{industrial production index}_t + a_2 \text{growth in consumer non durables and services}_t \\ &\quad + a_3 \text{growth in consumer durable goods}_t + a_4 \text{employment rate} + X_{i,t}^{\perp} \end{aligned} \tag{3}$$

where $X_{i,t}^{\perp}$ is the residual of the regression for each proxy X_i.

The residual is the excess part of each proxy X_i over the part which is caused by fundamental factors. Hence, it is possible that this excess part of X_i may be caused by investor sentiment. The group of $X_{i,t}^{\perp}$ will be used to estimate the alternative index. The estimation model for the excess investor sentiment index ($ISI_t^{\perp}$) is the same as that for the two-step composite investor sentiment index. The only difference is that to construct $ISI_t^{\perp}$ we use $X_{i,t}^{\perp}$ in stead of X_i. The estimation model for the excess investor sentiment index is as follows.

$$ISI_t^{\perp} = w_1^{\perp} X_{1,\tau}^{\perp} + w_{2,}^{\perp} X_{2,\tau}^{\perp} + ... + w_N^{\perp} X_{N,\tau}^{\perp} \tag{4}$$

where $\tau = t$ or $t - k$ depending on which variable has higher correlation with the first stage index calculated by using current $X_{i,t}^{\perp}$ and their lags,

$w_j^{\perp}$ = first principal component loading factor for variable j.

4.2 Test of the Index

The objective of this paper is to develop investor sentiment index which could reflect SET investors's attitudes, emotions or viewpoints in each period of time. The real investor sentiment is actually unobservable. To measure investor sentiment is an intangible concept. Up to our knowledge, the theory has not yet provided a method to verify that an investor sentiment index is the best. The literature suggests various ways to empirically test the index. An empirical test is important to give a tangible sense to the constructed investor sentiment index. This paper uses three criteria to choose the index from among the indices calculated by many possible sets of proxies. Firstly, all loading coefficients have the expected sign as suggested by the theory. Secondly, the constructed sentiment index should have substantial returns predictive power. We examine the return predictability of the constructed index by regressing excess market returns on the constructed index. The proxies for the returns are mai, SET50 and variance of SET.Thirdly, the selected index could capture major historical events of the stock exchange of Thailand. We test the index to see how the constructed index corresponds to the anecdotal accounts of bubbles and crashes of the stock exchange of Thailand. In addition, a robustness check and out-of sample predictability test will be conducted.

5 Results

This section discusses the results for the two-step composite investor sentiment index and the excess investor sentiment index and the predictive power of the index. Investor sentiment indices for all possible sets of potential investor sentiment proxies will be estimated. There are too many estimation results to display all of them here. Therefore, we show the results for the selected investor sentiment index. Specifically, we show the estimation results for the set of four proxies, namely $NIPO$, $LDTURN$, S , and $NFBVAL$ and their one-month lag. The results for this set of five proxies and their one-month lag can be extended to the other cases. We select this set of five proxies and their one-month lag because the results best satisfy our three criteria; all loading factors have the correct sign as suggested by the theory, the calculated investor sentiment index has substantial return predictability and the index could capture anecdotal bubbles and crashes. In the section 6 Robustness Check, similarities and differences between this selected case and other cases will be discussed and out-of-sample predictability test will be conducted.

5.1 The Two-Step Composite Investor Sentiment Index

The first stage index is formed by using unrotated principle component to correlation of $NIPO_t$, $LDTURN_t$, S_t, $NFBVAL$, $NIPO_{t-1}$, $LDTURN_{t-1}$, S_{t-1}, $NFBVAL_{t-1}$. Appendix A reports the summary statistics for the selected proxies. We show the estimation for the full sample period, from January 2005 to December 2015. All proxies are standardized to have zero mean and unit variance. The first stage sentiment index, ISI_t^0 is given by,

$$\begin{aligned} ISI_t^0 \quad = \quad & 0.18908876NIPO_t + 0.50475041LDTURN_t + 0.43829019S_t + 0.11736648NFIBVAL_t \\ & 0.22098706NIPO_{t-1} + 0.48803955LDTURN_{t-1} \\ & +0.44038812S_{t-1} + 0.15046462NFIBVAL_{t-1} \end{aligned} \tag{5}$$

They all have the correct loading sign. The first principal component above can explain 28.75 percent of sentiment variables' variance.

The Second Stage Index is introduced to reduce the loading variables. For each proxy, either the level or its lag is chosen if it has a higher correlation to ISI_t^0. The sentiment index, ISI_t^1, is formed by using first principle component to those proxies as shown in equation 6.

$$ISI_t^1 = 0.37577033NIPO_{t-1} + 0.58322309LDTURN_{t-1} + 0.64904828S_{t-1} + 0.31206379NFBVAL_{t-1} \tag{6}$$

All proxies's loading factors have the correct sign as predicted by the theory. The first principal component above can explain 26.67 percent of sentiment variables' variance. The correlation between the first stage index (ISI_t^0) and the second stage index (ISI_t^1) is 0.9100. Thus, sentiment index ISI_t^1, which is the second-stage index, can deliver the same information as the first-stage index but using half of variables.

5.2 The Excess Investor Sentiment Index

All investor sentiment proxies, $NIPO_t$, $LDTURN_t$, S_t, $NFBVAL_t$ may contain both business cycle and sentiment components. Principal component technique cannot extract sentiment component from the investor sentiment proxies. Therefore, the second stage index ISI_t^1 may contain both business cycle and sentiment components. We run the regression in equation 3 for each factor and use the residuals to form the first stage and the second stage investor sentiment index. We use the second stage investor

sentiment index which is estimated by using the residuals and we call it the excess investor sentiment index. The excess investor sentiment index, $ISI_t^{\perp}$, is given by,

$$ISI_t^{\perp} = 0.56036966NIPO_{t-1}^{\perp} + 0.39282328LDTURN_{t-1}^{\perp} + 0.53899971S_t^{\perp} + 0.49027379NFBVAL_{t\text{-}1}^{\perp} \quad (7)$$

All proxies's loading factors have the correct sign as predicted by the theory. The first principal component above can explain 23.37 percent of sentiment variables' variance.

5.3 Validation Discussion

5.3.1 In-Sample Test of Predictability

After getting the investor sentiment index, it is interesting to see if the sentiment have substantial predictive power with the excess market returns. The excess market return is the return on market over the risk free rate. The index is further tested if it could be a leading indicator for market movement. The index and it's difference squared are used to explain four market returns; mai, SET, SET50 and SET100. The traders in a smaller market, like mai, are more prone to market sentiment, while ones in bigger market, like SET100, are not. Thus the index is expected to have some prediction power over return on mai.

To test the predictive power of the investor sentiment index for market return, the four market returns are regressed on investor sentiment index (ISI_t). The regression equation is as follows.

$$\text{Market Excess Return}_{t+h} = \beta_0 + \beta_1 ISI_t + \beta_2 \text{Market Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h}, \quad (8)$$

where there are four indicators for market returns: mai, SET, SET50 and SET100. There are two investor sentiment indices(ISI_t): The two stage composite index (ISI_t^1) and the excess investor sentiment index ($ISI_t^{\perp}$). h is the forecast horizon. The variable, Market Excess Return for the forecast horizon h is defined as the h months market return over the yield on h-month Treasury bill. The forecast horizon are 1, 3, 6 and 12 months due to the availability of the data for the yields on treasury bill. This regression allow us to see how many periods ahead that the index have impact on the market return. In this setup, if the null hypothesis that $\beta_1 = 0$ is rejected, then investor sentiment index has predictive ability for the market return.

Table 1 and table 2 summarizes the beta estimates for The two stage composite index (ISI_t^1) and the excess investor sentiment index ($ISI_t^{\perp}$) respectively. According to information in table 1 and table 2, the developed investor sentiment index has a strong predictive ability for excess return on mai, SET and SET50 for 3, 6, 12 month horizon. $ISI_t^{\perp}$ has a strong predictive ability over excess return on mai, SET and SET50 for 6 and 12 month horizon.

In terms of the direction, the results show that the beta coefficients are negative. This result is consistent with the theory. High sentiment is followed by low subsequent market excess return. The investor's optimism leads to overvaluation and a subsequent lower future return as the stock price converges back to its fundamental values.

In terms of magnitudes, these coefficients for ISI_t^1 and $ISI_t^{\perp}$ for mai are greater that for SET and that for SET50. This result corresponds with the theory. Small capitalized stocks should be affected more by investor sentiment than large capitalized stocks. Stocks traded in mai are typically smaller than those traded in SET. On average, The component stocks in SET50 are larger than that in SET since SET50 includes only the top 50 largest capitalization stocks. Baker and Wurgler (2006, 2007) provide an empirical evident that low capitalization stocks are more prone to investor sentiment than high capitalization stocks. Theoretically, Lee, Shliefer, and Thaler (1991) suggests that small stocks tends to be held by small investors who may more frequently engage in noise trading than institutional investors. Small investors are more likely to be affected by sentiment than institutional investors who typically have more information on fundamental values. Small stocks should be more prone to investor sentiment. The traders in a smaller market, like mai, are more prone to market sentiment, while ones in bigger market, like SET100, are not. Thus, the effect of the investor sentiment on the future excess return for mai should be stronger than that for SET, SET100 an SET50.

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5.3.2 Investor Sentiment Index, Business Sentiment Index and Consumer Confident Index

Figure 2 compares Investor Sentiment Index to Business Sentiment Index, BSI, constructed by Bank of Thailand and Consumer Confident Index, CCI, hosted by University of Thai Chamber of Commerce. Both BSI and CCI are survey based indices. For the comparison purposed, both indices are normalized to have zero mean unit variance. So positive and negative value for BSI and CCI in this figure do not necessary imply positive or negative sentiment. But the correlation and trend are comparable. Even though ISI is constructed using aggregate data, it shows high correlation with BSI and CCI that come

Table 1: The Two-Stage Composite Investor Sentiment Index and Market Return

$$\text{Market Excess Return}_{t+h} = \beta_0 + \beta_1 ISI_t + \beta_2 \text{Market Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h},$$

There are four market returns: mai, SET, SET50 and SET100. The table below shows only β_1, beta coefficient for ISI_t^1 . The complete regression result is shown in Appendix D.

Horizon	mai		SET		SET100		SET50	
	β_1	SD	β_1	SD	β_1	SD	β_1	SD
0	0.0143	(0.0620)	0.0551	(0.0600)	0.217**	(0.0864)	0.0580	(0.0630)
1	-0.0289	(0.0597)	-0.0190	(0.0561)	0.0327	(0.0820)	-0.0248	(0.0589)
3	-0.0692*	(0.0408)	-0.0652*	(0.0375)	-0.0272	(0.0613)	-0.0680*	(0.0390)
6	-0.121***	(0.0317)	-0.0851***	(0.0300)	-0.0478	(0.0452)	-0.0792**	(0.0304)
12	-0.0794***	(0.0230)	-0.0490**	(0.0211)	0.0236	(0.0480)	-0.0424**	(0.0206)

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table 2: The Excess Investor Sentiment Index and Market Return

$$\text{Market Excess Return}_{t+h} = \beta_0 + \beta_1 ISI^{\perp}{}_t + \beta_2 \text{Market Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h},$$

There are four market returns: mai, SET, SET50 and SET100. The table below shows only β_1, beta coefficient for $ISI_t^{\perp}$. The complete regression result is shown in Appendix E.

Horizon	mai		SET		SET100		SET50	
	β_1	SD	β_1	SD	β_1	SD	β_1	SD
0	0.0110	(0.0611)	0.0387	(0.0632)	0.176*	(0.0910)	0.0377	(0.0673)
1	-0.00134	(0.0586)	0.00222	(0.0583)	0.0580	(0.0833)	-0.00445	(0.0617)
3	-0.0522	(0.0405)	-0.0579	(0.0390)	-0.00666	(0.0600)	-0.0601	(0.0409)
6	-0.118***	(0.0322)	-0.0893***	(0.0310)	-0.0653	(0.0439)	-0.0849***	(0.0316)
12	-0.0975***	(0.0228)	-0.0547**	(0.0210)	-0.0321	(0.0376)	-0.0496**	(0.0204)

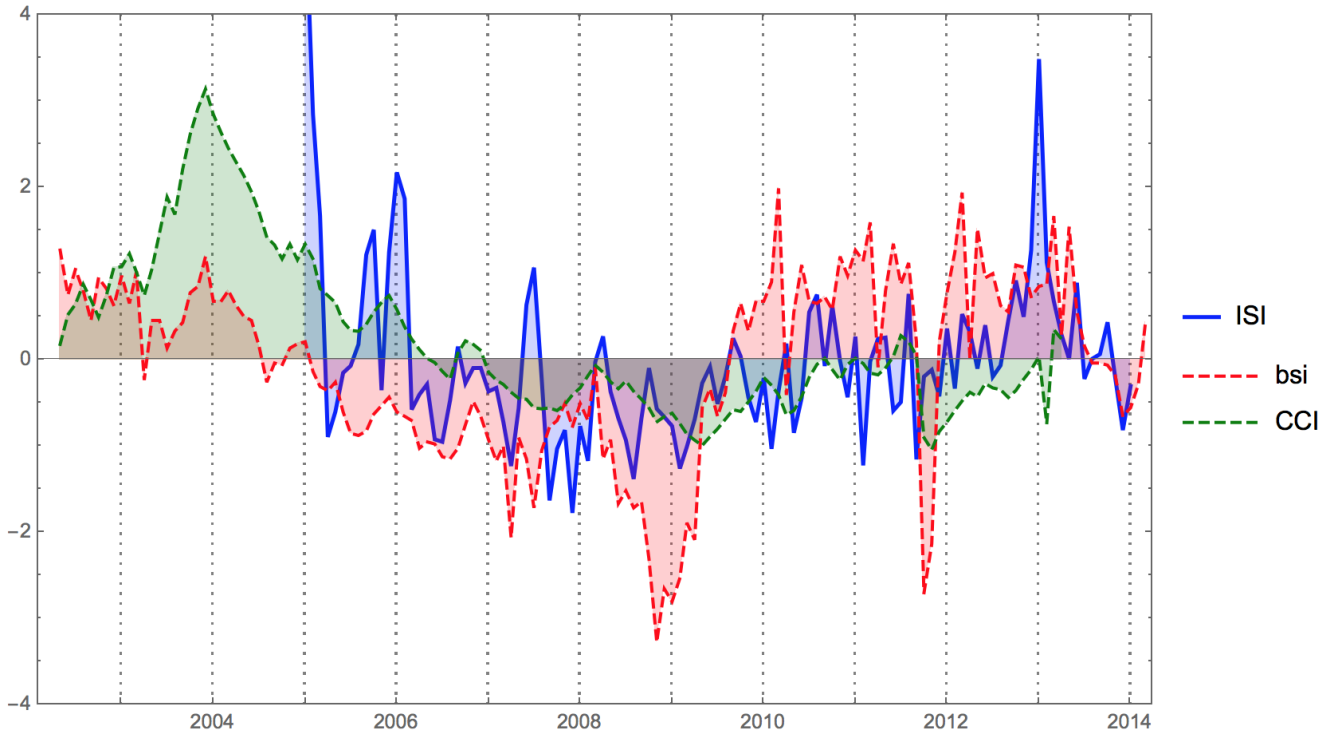
Note: *** p<0.01, ** p<0.05, * p<0.1.

from survey base approach, especially after sub-prime crisis in late 2008. However, ISI shows to be more sensitive than the others. The reason is that stock market is more sensitive to news. Also, there are some specific issues that affect only to the stock market. The result also suggests the all indices move together with some variation from each own aspect in which the index is monitoring. This draws attention to further examine in more detail for ISI.

5.3.3 Sentiment cycle

According to figure 3, during Jan 2000 – July 2015, ISI showed 3 major cycles. The first one was the uptrend from Jan 2000 – Mar 2006, when Thai economy recovered from Tom Yum Kung crisis in 1997.

Figure 2: Index Comparison



The second wave was the downtrend since Apr 2006 – Nov 2012 due to series of political uncertainty (2006-current), Sub-prime crisis in U.S. (2008), Sovereign debt crisis in EU (2009) and Flooding (2011). The last one called volatile period since Dec 2012 – July 2015. Although, unconventional expansion monetary policy (QE) from FED lowered cost of funding and increased fund flow to risky asset, which made SET index rally for the last 5 years, the concerns about QE tapering (2013) and global oil price tumbling (2014) affected investor sentiment to swing dramatically.

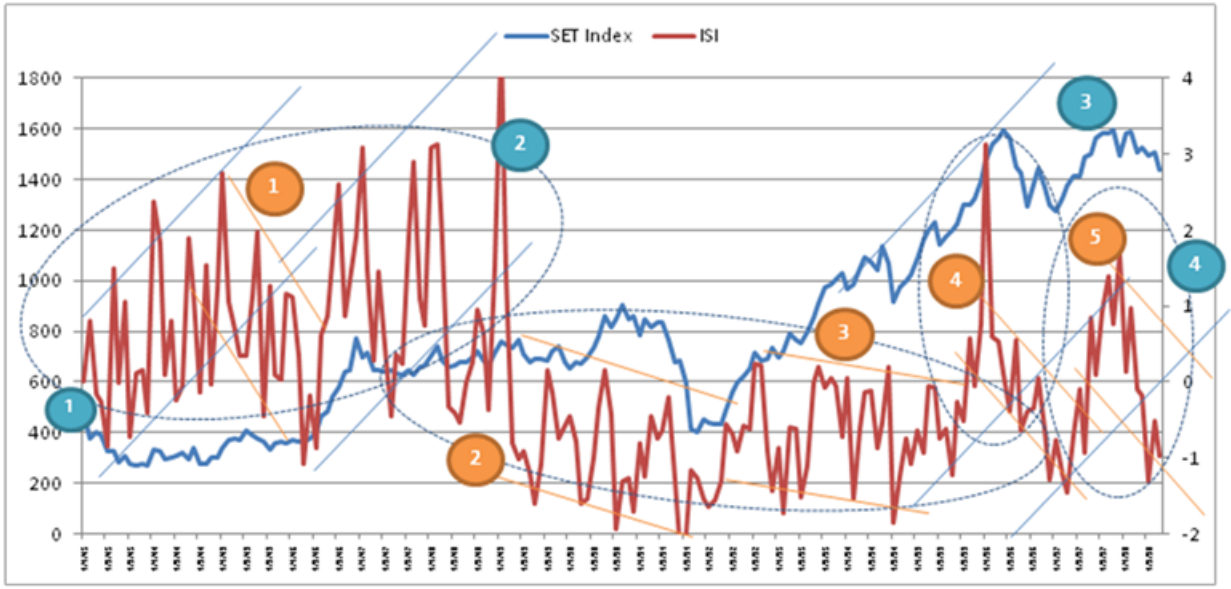
ISI was more volatile in the uptrend, the duration for upward sentiment was around 4-6 months and it took only 1-2 months to get back to normal level. In contrast, in the downward side, the duration was a bit longer around 6-8 months and it took 3-4 months for correction. From this point, it could refer to policy implication that no need to launch any measures to correct investor sentiment in the uptrend, since it can correct itself easily. However, in the downtrend, issuing measures could be more appropriate. Overall, the sentiment cycles on upside trend lasts longer than the sentiment cycles on the downside trend.

ISI explained uptrend return of SET index better than downtrend. During Jan 2000 – Dec 2014 (15 years), there were 5 years that ISI showed positive value more than negative value, which annual SET return was positive for 4 years or 80% correct, while there were 8 year that ISI showed negative

value more than positive value, which annual SET return was negative for 4 years or only 50% correct.

Predicting SET index return by ISI. If the ISI showed that investor sentiment was extremely high, 6 months after, SET index return will drop about 10%, in contrast, if ISI showed that investor sentiment was extremely low, 6 months after, SET index return will rise about 20%.

Figure 3: Sentiment Cycles



5.3.4 An Anecdotal History of Set Index and Investor Sentiment Index

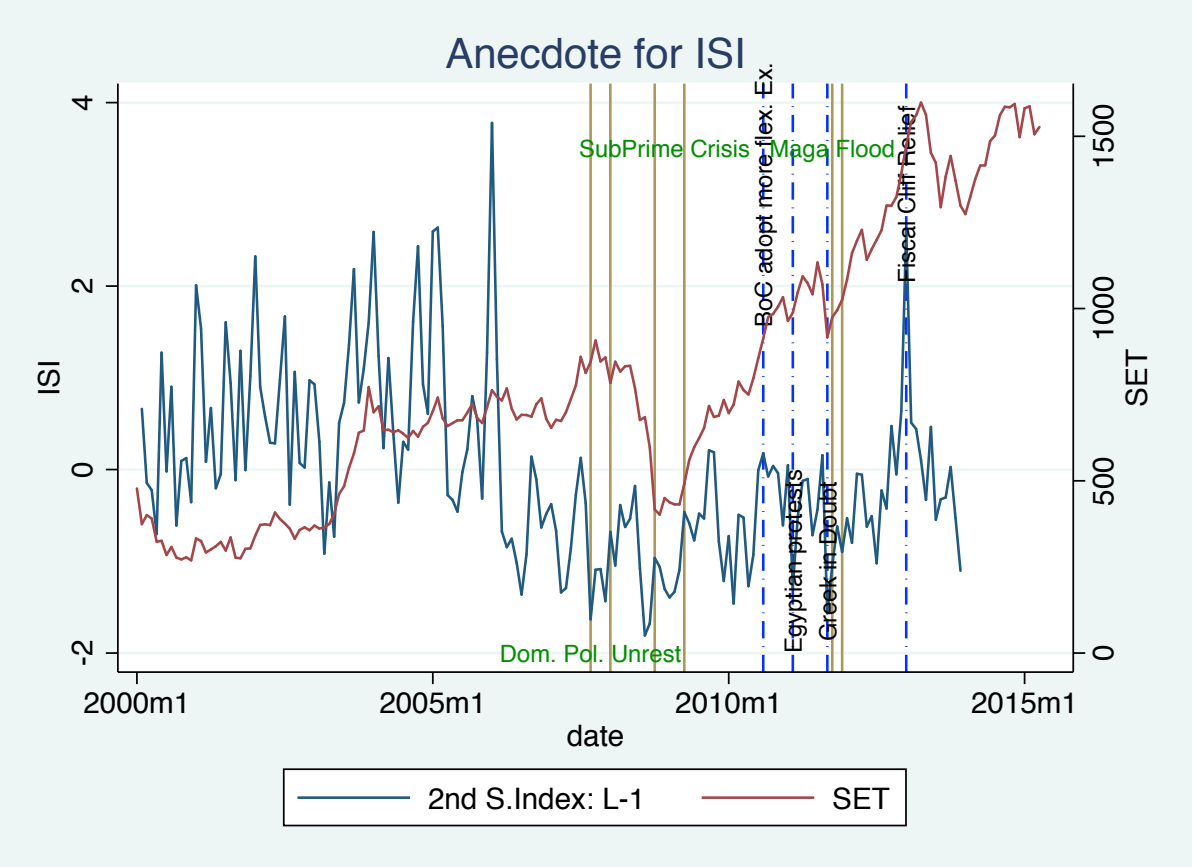
Major events[1] that impact world wide and stock exchange of Thailand are plotted against ISI in Figure 4. Three major periods to pay attention are domestic political unrest in July 2007 to January 2008, Sub-prime Crisis in October 2008 to April 2009 and Thailand mega flood in late 2011. The political unrest around late 2007 drove down investor sentiment, indicated by low ISI along with the drop in SET index. SubPrime Crisis in late 2008 had negative impact to stock market around the world. SET index dropped deeply. ISI also can capture negative sentiment during this crisis. Mega flood in late 2011did not have a great impact on stock market. ISI picked up some trivial degree of negative sentiment. According to these major events, ISI can indicate the sentiment quite well.

Besides big events that drive drag negative sentiment for some months, there are some spikes in ISI that should be take a close look. Correspond to a steep climb of SET, the most noticeable spike is at January 2013. ISI increases drastically and resumes its trend. The market responded positively to the news that China's GDP Q4/12 grew for the first time in the last 2 years. Moreover, U.S. congress

[1] A full list of events that impact SET can be found in appendix F.

temporary passed the debt ceiling bill. Another interesting spike is at just before the Mega flood in late 2011. In September 2011, SET dropped sharply. Investors switched from securities to less risky assets in response to Greek bailout plan, which was still in doubt after the EU-IMF conference ended. SET index closed at 904.06 points, down 54.1 points The last interesting spike is in February 2012. The SET index and other Asian stock indices started to decline due to escalating tension in the Korean Peninsula since December 2011. The atmosphere was amplified by political protests in Egypt between protesters and the government. Egyptian protests escalated into prolonged violence. Investors started to worry about expansion of political protests in North Africa and Middle East, which would raise oil prices. From these events, ISI can explain investing environment quiet well. In other word, transitional and spikes of ISI signals big news which drives investor sentiment.

Figure 4: Sentiment Index and Set Index



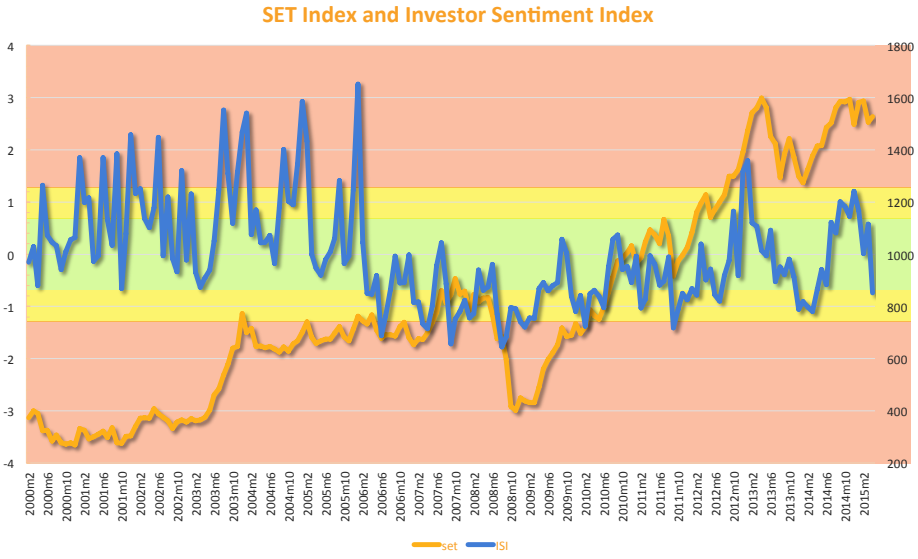
5.3.5 Application of Investor Sentiment Index

Previous sections show that ISI can be used to be a coincident indicator and warning indicator for the market. Investors are sensitive to news, so does the ISI. Contrast to BSI and CCI, fluctuation is expected for ISI. Thus a little fluctuation in sentiment is acceptable for the market, while a large deviation from

normal sentiment suggests abnormal situation that needs a closer attention. This section propose a method to utilize ISI.

Since Principal component to correlation matrix is applied to construct ISI, the index has approximately zero mean and unit variance. The standard normal distribution can be applied to interpreted the index level. This suggests that there is about 50 percent chance that ISI fluctuates around ± 0.67 ($P[|ISI| \leq 0.67] = 0.497$) , 80 percent chance around ± 1.63 ($P[|ISI| \leq 1.3] = 0.806$) and about 20 percent that ISI will exceed ± 1.3. Figure 5 plot ISI in three zones. The green zone indicates a normal sentiment. The sentiment in this level is considered normal and there is not much to concern. The yellow zone suggests a sentiment trading behavior. Sentiment that reaches this level can be found 5 out of ten month on average. This zone suggests a closer attention is needed. The red zone puts a warning sign for excessive sentiment. The sentiment in this zone can be found 2 out of ten months on average, indicating an abnormal sentiment in the market. As sentiment is negatively correlate to future return, high positive (negative) sentiment could lead a drop (rise) in future return. Thus having a closer monitor for the yellow and red zone will benefit to stabilize the market.

Figure 5: Three Zone ISI



6 Robustness

Previous sections use $NIPO\ LDTURN\ S\ NFBVAL$ using data from 2000m1 to 2014m12 to construct the investor sentiment index. Besides the full sample set, this section tests whether the index is sensitive to sample period or not. In particular, another 4 subsamples are considered. Additionally, this section discusses other possible set of proxies to be used to construct the index. Every alternative sets of proxies use $NIPO\ LDTURN\ S$ and replace $NFIV$ by 1) ratio of active to all trading account ($ACTIVERATE$, $PDND$), 2) net retail buy ($NRET$), 3) ratio of retail traders to all traders ($RETAIL$) 4) change of consumer confident index ($dCCI$) and 5) log difference of volatility premium ($dLVOLP$). The first and the first log difference form is used for CCI and $VOLP$, respectively, are applied because they are non-stationary series.

Sample Period	Description
2000m1 to 2014m12	Full Sample
2000m1 to 2007m12	End one year before Hamburger Crisis
2000m1 to 2009m12	End one year after Hamburger Crisis
2008m1 to 20014m12	Start one year before Hamburger Crisis
20010m1 to 20014m12	Start one year after Hamburger Crisis

Table 3 below shows the sign of loading coefficient from the first order PCA. As discussed in previous sections, all loading coefficients are expected to have positive sign, except $PDND$. For each set of proxy, combination of each proxies and its particular lag are considered as mentioned in previous sections. In this section, the lag 0 1 2 3 and 6 are examined[2]. The letter "y" indicates that all loading have correct sign as suggested by theory and "n" indicates that at least one variable has a wrong sign.

$NIPO\ LDTURN\ S\ NFBVAL$ The first lag and no lag model give correct sign for all subsamples. Using 2008m1 to 2013m12, only lag 2 gives the correct sign for both ISI and $ISI^{\perp}$. Using full sample, 2000m1 to 2014m12, all lag structure model, except lag 6, give the correct loading sign. Only no lag and first lag model give incorrect sign in all subsamples. Lag 2, lag 3 give wrong sign of loading coefficients when the sample size is reduced. For example, when the sample period stop at one year before the Hamburger crisis or starts two years after the crisis. These results suggest that using the no lag or first lag model, the constructed ISI will conform with theory.

[2]The higher lag usually gives incorrect sign of loading coefficient, so they are dropped from the analysis

Table 3: Sign of Loading Coefficients

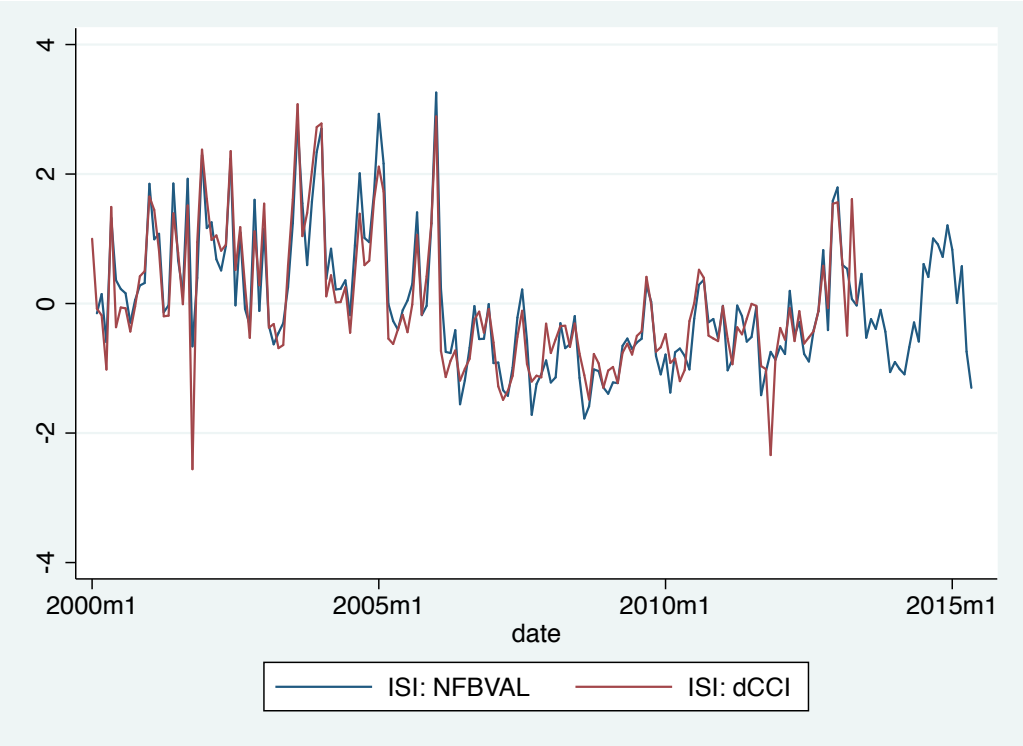
Proxy	lag	2000m1-2014m12		2000m1-2009m12		2000m1-2007m12		2008m1,2014m12		2010m1,2014m12	
		ISI	ISI⊥	ISI	ISI⊥	ISI	ISI⊥	ISI	ISI⊥	ISI	ISI⊥
NIPO LDTURN S NFBVAL	0	y	y	y	y	y	y	y	y	y	y
	1	y	y	y	y	y	y	y	y	y	y
	2	y	y	y	y	n	n	y	y	n	n
	3	y	y	y	y	n	n	y	n	y	y
	6	y	n	y	n	n	n	n	n	n	n
NIPO LDTURN S ACTIVERATE PDND	0							y	y	y	n
	1							y	y	y	n
	2							y	y	y	n
	3							y	y	y	n
	6							y	n	y	n
NIPO LDTURN S NRET	0	y	n	y	n	n	n	y	y	y	y
	1	y	n	y	n	n	n	y	y	y	y
	2	y	n	y	n	n	n	y	y	y	y
	3	n	n	y	n	n	n	y	n	y	y
	6	y	n	y	n	n	n	y	y	y	y
NIPO LDTURN S RETAIL	0	y	y	y	y	y	y	y	y	y	y
	1	y	y	y	y	y	y	y	y	y	y
	2	y	y	y	y	y	y	y	y	y	y
	3	y	y	y	y	y	y	y	y	y	y
	6	y	y	y	n	y	n	y	n	n	y
NIPO LDTURN S dCCI	0	y	y	y	y	y	y	y	y	y	y
	1	y	y	y	y	y	y	y	y	y	y
	2	y	y	y	y	y	y	y	y	y	y
	3	y	y	y	y	n	y	y	n	y	y
	6	y	y	n	y	n	y	y	y	y	y
NIPO LDTURN S dLVOLP	0	y	n	y	y	y	y	n	y	n	n
	1	y	y	y	y	y	y	n	n	n	n
	2	y	n	y	y	y	y	n	n	n	n
	3	y	n	y	y	y	n	n	n	n	n
	6	y	n	y	n	y	n	y	n	n	n

NIPO LDTURN S ACTIVERATE PDND: This set of variables starts from 2008m1 because $ACTIVERATE$ is available from 2008m1. For both subsamples, all lag models, except lag6, give the correct sign for ISI. On the contrary, all lag models, give the wrong sign for $ISI^{\perp}$ in the last subsample. These mistakes might be a part this subsample in which Hamburger Crisis occurred. To test the validity of $ACTIVERATE$ in constructing the index, a longer sample is required. However, with the limitation of data, the conclusion cannot be made.

Additionally, this study also tries to find other combination of proxy that gives correct loading sign of proxies. The results, which has not shown here, find that when $PDND$ is included as a proxy, loading coefficients of proxies turn to have incorrect sign. Thus, $PDND$ is dropped from the remaining set of proxies.

NIPO LDTURN S NRET : Retail traders play important role in emerging market like Thailand. Thus, net buy of retail traders, $NRET$, is considered as alternative proxy to $NFINV$. This set of proxies gives correct sign of loading coefficient in most subsamples and lag models for ISI but gives incorrect sign of loading coefficients in many subsamples and models for $ISI^{\perp}$. Especially during 2000m1 to 2007m12, one year before the Hamburger Crisis, all model structure give wrong loading coefficients. Thus, the results suggest that that model with $NRET$ does not perform better than $NFINV$.

Figure 6: ISI by NFINV and dCCI



NIPO LDTURN S RETAIL : Besides $NRET$, the ratio of retail traders to all traders is considered as another proxy of retail traders. It gives correct sign of loading coefficients for all lag models of ISI and $ISI^{\perp}$ in almost all subsamples. Thus, this set of proxy is a good candidate. The results suggest that this set of proxies have a limitation when the crisis period is considered. Further examination found that the proxy using $NFBVAL$ or $RETAIL$ gives a very similar ISI. Moreover, foreign investors usually play an important role in leading retail investors in small market like Thailand. Thus, the model with $NFBVAL$ with no or first lag structure has a slightly advantage in indicating the sentiment.

NIPO LDTURN S dCCI : Consumer Confident Index gives correct sign of loading coefficients for almost all models. This model is considered a another potential candidate in that it gives correct sign across sub samples, especially the crisis period. However, it is not surprised to see these preferable results since CCI itself is a survey based sentiment index. Figure xxx plots ISI from $NFINV$ in red-dotted line and $dCCI$ in blue-bold line. Interestingly, the model with $NFINV$gives a very similar index to the one using $dCCI$.

NIPO LDTURN S dLVOLP : Instead of using $NFBVAL$, log difference of volatility premium, *dLVOLP*, gives similar sign as $NRET$. It gives correct sign of loading coefficients for ISI in

almost all subsamples but gives incorrect sign in some subsamples.

The correct sign of loading coefficients is the most important feature of constructing a sentiment index. The above results show that some set of proxies give correct sign in some subsamples and wrong sign in other subsamples. The set of proxies whose sign are consistent across subsamples indicates that it reflects persistent information. This feature of the proxies is crucial when the index is used to indicates investor sentiment during any crises, in particular the Hamburger Crisis in this study. Among the others, a set of proxy with $NIPO\ LDTURN\ S$ together with $NFBVAL$ or $RETAIL$ or $dCCI$ gives correct sign of loading coefficients across all subsamples. With reasons discussed above, $NIPO\ LDTURN\ S\ NFBVAL$ is chosen.

The results from this section also provide suggestion on how to use data to construct the index. To reconstruct the index, extended windows method is preferred to rolling windows. Using rolling windows, the index will encounter some sample period in which the initial period is in a crisis period, which leads to incorrect sign of loading coefficients.

7 Out of Sample Properties

This section proposes a procedure to construct ISI for monitoring rather tracking purpose. As did in previous section, ISI is constructed within the same period as the loading coefficient is estimated. This approach will not be efficient if the index is used for monitoring the current sentiment. Because the loading coefficient has to be estimate every months when new available data of proxy is realized. Even though reestimate the loading every month is not a difficult process, monthly changes in the loading can confuse general people. The confusion can be reduced if the updating process is not too frequent.

7.1 Out of Sample ISI

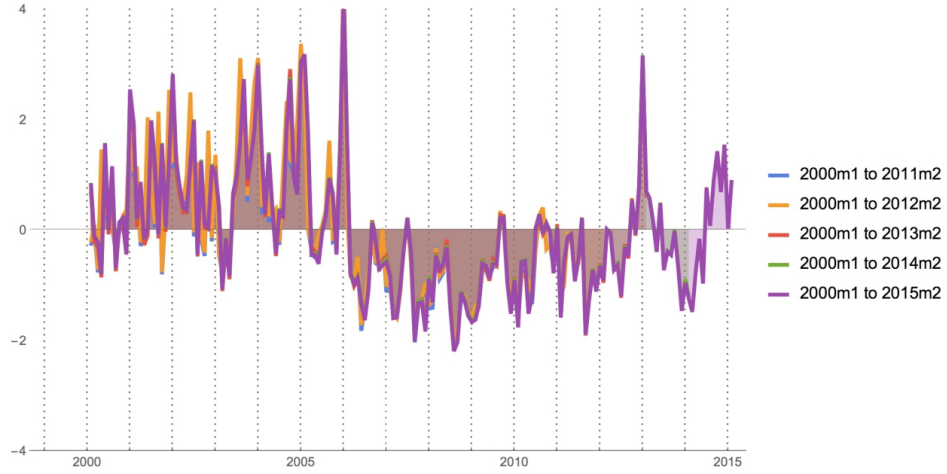
The index is proposed to update annually at the of February each year. December and January, which marks the end and beginning of calendar year, seems to be a reasonable timing to update the loading. However, investor's trading behavior in these two months are different from other months. Therefore, using December or January can mislead the loading coefficient and might be ignored by public, which have potential disadvantage. February, instead, is considered a normal month where investors resume normal trading behavior. Thus the estimated loading should be more normal and announcement of the update can be easier absorbed by public.

Table 4 shows the second step proxy and loading coefficients from extended windows estimation. The smallest window size is 12 years from 2000m1 to 2011m2. A 12-year windows estimation should long enough to cover a complete business cycle. Thus the loading and the resultant ISI should be able to reflect investor average attitude. The table shows that most of proxy have the same lag structure throughout all windows except S. Within the first two estimating windows, S_t has higher correlation with the first step index than S_{t-1}. Thus, S_t is selected as a proxy. However when the size of the windows extends to 2013m3 onward, S_{t-1} is selected as a proxy. Turn to the size of loading coefficient. The loadings of $LDTURN$ and S are slightly change over the size of windows, while ones of $NIPO$ and $NFBVAL$ have higher variations. ISI constructed by using proxies and loading coefficients in Table 4 are compared in Figure 7.

Table 4: Extended Windows Estimation

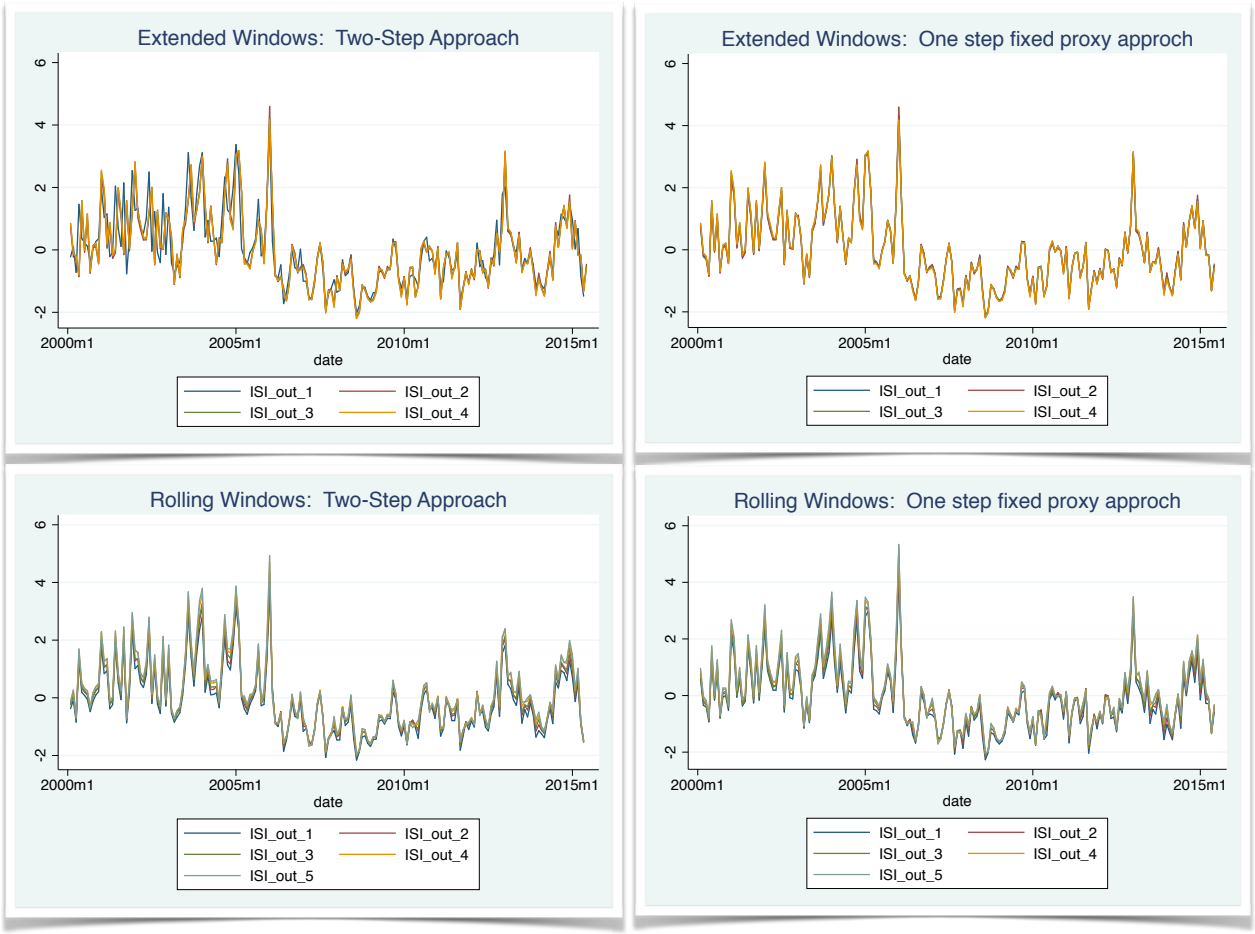
2000m1 to 2011m2	$NIPO_{t-1}$	$LDTURN$	$NFBVAL_{t-1}$	S_t
	0.3935	0.5746	0.2545	0.6710
2000m1 to 2012m2	$NIPO_{t-1}$	$LDTURN$	$NFBVAL_{t-1}$	S_t
	0.4041	0.5742	0.2261	0.6752
2000m1 to 2013m2	$NIPO_{t-1}$	$LDTURN$	$NFBVAL_{t-1}$	S_{t-1}
	0.4406	0.5455	0.2966	0.6484
2000m1 to 2014m2	$NIPO_{t-1}$	$LDTURN$	$NFBVAL_{t-1}$	S_{t-1}
	0.3702	0.5713	0.3079	0.6647
2000m1 to 2015m2	$NIPO_{t-1}$	$LDTURN$	$NFBVAL_{t-1}$	S_{t-1}
	0.3758	0.5832	0.3121	0.6490

Figure 7: ISI in Subsample



The ISI plotted in Figure 8 are considered in-sample index. It shows that even though proxies and loading coefficients are different, the indices are quite similar. Therefore it is quite safe to use S_{t-1} as a proxy to construct ISI in all estimation sample.

Figure 8: Out of Sample ISI



The selection of proxy and type of windows estimation are explored further in Figure 3. However instead of constructing the index in the same period as the loading is estimated, the index is constructed for the whole sample. Thus the indices in this figure are considered out-of-sample indices. The top panel shows the indices from extended windows estimations, while the lower panel shows ones from rolling windows estimation. The left panel demonstrates the indices from two-step approach, while the right panel displays ones from one-step fixed proxy approach. The results show that ISI is quite robust across both estimation estimation windows and estimation procedure.

7.2 Out of Sample Predictive Power Test

This section examines out-of-sample predictive power of ISI. Section 5.3.1 shows that ISI helps explain changes in MAI SET $SET50$ and $SET100$. A higher sentiment drives up the index at the current period and reverse back in the future. Accordingly, ISI is found to help predict a mean reversion in 6

and 12 months ahead. However, predictive power might be different when out-of-sample is considered. A lower root mean squared error (RMSE) is used as a criteria to access out-of-sample predictive power. For comparison purpose, a simple AR(1) with $dLVOLP$ is adopted as the competing model, called $MODEL2$.

Procedure

1. Specify an estimating period , staring with 2000m1 to 2011m2.
2. Estimate loading coefficients using one-step fixed proxy approach.
3. Construct in-sample ISI
4. Use estimation sample and in-sample ISI to estimate forecasting model.
   (a) $MODEL1$: Market Excess Return$_{t+h} = \beta_0^1 + \beta_1^1 ISI_t + \beta_2^1$Market Excess Return$_t + \beta_3^1 ln(\frac{VOLP_t}{VOLP_{t-h}}) + \epsilon_{t+h}^1$,
   (b) $MODEL2$: Market Excess Return$_{t+h} = \beta_0^2 + \beta_2^2$Market Excess Return$_t + \beta_3^2 ln(\frac{VOLP_t}{VOLP_{t-h}}) + \epsilon_{t+h}^2$,
5. Use estimated loading coefficients to construct ISI for another year and use estimated forecasting models to predict excess return starting from March forward.
6. Extend the estimating period in 1. for another year
7. Repeat 1-6 until the estimation period is 2000m1 to 2014m2

Table 5 shows RMSE of both $MODEL1$ and $MODEL2$ for current period, 1, 3, 6 and 12 months ahead. RMSE of $MODEL1$ and $MODEL2$ are shown in the top and middle panel, respectively. The bottom panel shows reduction in RMSE in percentage number with negative sign indicating a better performance of $MODEL1$. The out-of-sample sample interval ranging from 2012m3 to 2015m3, spanning for 36 observations.

For MAI, ISI performs better than the competing model in 3, 6 and 12 months ahead. The model performs the best for 6-month ahead, while it barely improves the prediction for 3-month ahead. The predictive ability for current and one month ahead does not better than the competing model.

Out-of-sample predictive power for other indices have similar pattern. The model weakly improves the predictability for the current period return, except return on $SET100$ in which a strong weak relationship between ISI and excess market return is found. However, the performance of the model

Table 5: Out of Sample RMSE

MODEL1

Horizons	0 month	1 month	3 months	6 months	12 months
MAI	0.907	0.894	0.655	0.490	0.306
SET50	0.711	0.716	0.448	0.340	0.242
SET100	0.782	0.839	0.555	0.503	0.305
SET	0.700	0.705	0.468	0.357	0.252

MODEL2

Horizons	0 month	1 month	3 months	6 months	12 months
MAI	0.892	0.892	0.657	0.501	0.311
SET50	0.712	0.712	0.441	0.330	0.249
SET100	0.825	0.825	0.550	0.507	0.295
SET	0.700	0.700	0.463	0.350	0.261

(MODEL1 - MODEL2)/MODEL2

Horizons	0 month	1 month	3 months	6 months	12 months
MAI	1.726%	0.282%	-0.273 %	-2.113 %	-1.730 %
SET50	-0.165 %	0.548%	1.453%	2.922%	-2.791 %
SET100	-5.159 %	1.727%	0.937%	-0.767 %	3.468%
SET	-0.058 %	0.675%	1.173%	2.078%	-3.437 %

is better in 12 months ahead, in which strong relationships between ISI and excess market return are found, as discussed in section 5.3.1.

The results in this section shed more light on the negative relationship between sentiment and future market return as theory suggested and supported by the results in previous section. The evidence is quite robust for MAI. The evidences for another indices are also in the same line but not as strong as MAI.

8 Conclusion

Asset markets thrive by efficiently allocating investments based on fundamentals or forward-looking information. Nevertheless, asset markets, whether in advanced economies or emerging markets, can be prone to factors beyond or unrelated to fundamentals: sentiment, animal spirits or exuberance. Booms can become more prolonged and busts more severe. On the other hand, negative sentiment can delay recovery. Nevertheless, research on measuring investor sentiment, particularly in emerging markets, has been lacking. This paper extends Baker and Wurgler (2006) and constructs a market-based investor sentiment index in the Stock Exchange of Thailand by extracting a common driving force across proxies of sentiment such as trading volume turnover, number of IPOs stock, share of equity issues in total equity and debt issues and net foreign trade.

The four proxies are selected since the associated investor sentiment index satisfies our criteria.

All loading factors have the correct sign as suggested by the theory. In-sample predictability test shows that the developed investor sentiment index display a strong predictive power with respect to mai, SET and SET50. The developed index's predictive power is stronger for mai than for SET and SET50. A positive sentiment is associated with a decrease in future excess return on market. Over optimism leads stocks to be overpriced in a current period and a decline in future stock price when the sentiment goes back to normal value.

While our developed investor sentiment index is a composite index of market-based indicators, the results show that our investor sentiment index is consistent with BSI and CCI, which are indices conducted by a direct survey. The advantage of our index is that it does not contain investor's biases and it uses lower cost and less time to obtain than the survey index does.

Our index can capture investor sentiment during some major events quite well. Sentiment cycles, on the upsides tend to last 6-8 months while on the downsides are a bit shorter, only 3-4 months. During the time of the events that drives a negative sentiment; for example, domestic political unrest in July 2007 to January 2008, Sub Prime Crisis in October 2008 to April 2009 and Thailand mega flood in late 2011, both our investor sentiment index and stock prices dropped deeply. Pessimistic trading causes stocks to be underpriced. This underpricing is eventually corrected and hence future returns tend to increase. On the contrary, during the time of the events that drives a positive sentiment; for example, fiscal cliff relief in 2012, both our investor sentiment index and stock prices increased sharply. Optimistic trading causes stock to be overpriced and the overpricing is eventually corrected over time.

The developed investor sentiment index can be divided into three zones according to the magnitude; the green zone for normal situation, the yellow zone for a sentiment trading and the red zone for a excessive sentiment trading. The categorized zones can be used as an indicator for early warning. Policy suggestion is that policymakers may take a closer monitor when our investor sentiment index is fallen into the yellow or the red zone.

In addition, the robustness check is performed to compare the selected investor sentiment index with other possible indices. The robustness check confirms that our investor sentiment index is similar to the other possible cases. The correct sign of loading coefficients is the most important features of the selected sentiment index. The selected formula for the index tends to produce the correct sign consistently for all subsample periods. However, for some set of proxies, the correct signs can be obtained only when the sample period is long enough. Therefore, to reconstruct the index, using extended windows is better than rolling windows. Since January effect and December effect are well-known calendar anomaly, this research proposes that the constructed index should be updated annually at the end of February each

year. The results from out-of-sample predictability test shows that the developed investor sentiment index displays significant out-of-sample predictive ability with respect to the market excess returns.

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Appendix A Summary Statistics of Selected Proxies forInvestor Sentiment

Figure 9: Time Series of Monthly Returns of Stock Exchange of Thailand

Figure 9 plots time series of monthly returns of stock exchange of Thailand and all sentiment proxies. The first row plots SET index and its mostly return. The other columns show the time series of proxies.

Appendix B The Second Stage Index

Figure 10: The Second Stage Index

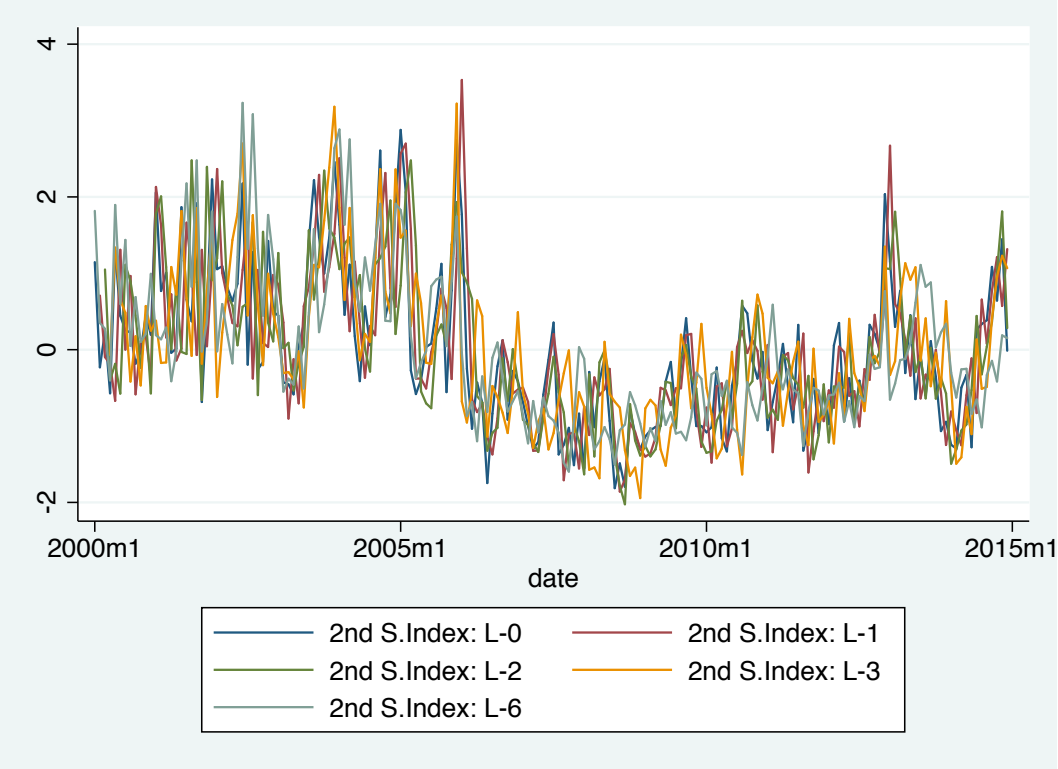
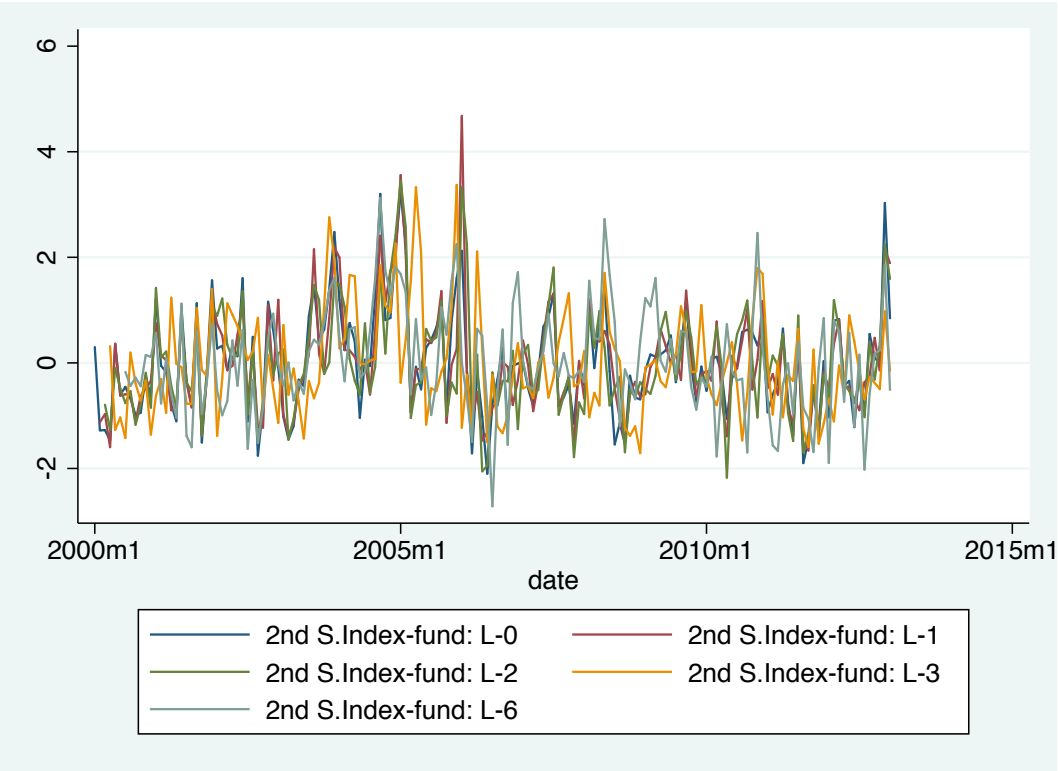


Figure 10 shows the investor sentiment index. 2nd S.Index: L_i shows the second stage investor sentiment index calculated by using proxies and its i-month lag.

Appendix C The Excess Investor Sentiment Index

Figure 11: The Second Stage Index



Appendix D In-Sample Predictability of The Two Stage Composite Investor Sentiment Index

Table D.1 : The Two-Stage Composite Investor Sentiment Index as a Leading Indicator for mai, in-sample estimation regression model estimation

$$\text{mai Excess Return}_{t+h} = \beta_0 + \beta_1 ISI_t + \beta_2 \text{mai Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h}$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.0143	-0.0289	-0.0692*	-0.121***	-0.0794***
	(0.0620)	(0.0597)	(0.0408)	(0.0317)	(0.0230)
mai	0.271***	0.275***	0.235***	0.0799	-0.274***
	(0.0901)	(0.0895)	(0.0893)	(0.0851)	(0.0678)
dln(volp)	2.076	2.077	0.312	0.297	0.0920
	(1.440)	(1.438)	(0.564)	(0.306)	(0.150)
Constant	0.00234	-0.0105	-0.000237	-0.00652	0.0689**
	(0.0726)	(0.0716)	(0.0498)	(0.0400)	(0.0293)
Observations	119	119	117	114	108
R-squared	0.085	0.087	0.078	0.119	0.220

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table D.2 : The Two-Stage Composite Investor Sentiment Index as a Leading Indicator for SET

$$\text{SET Excess Return}_{t+h} = \beta_0 + \beta_1 ISI_t + \beta_2 \text{SET Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h}$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.0551	-0.0190	-0.0652*	-0.0851***	-0.0490**
	(0.0600)	(0.0561)	(0.0375)	(0.0300)	(0.0211)
SET	0.186**	0.213**	0.232**	-0.0264	-0.241***
	(0.0905)	(0.0873)	(0.0931)	(0.0912)	(0.0803)
dln(volp)	4.613***	4.685***	1.109**	1.036***	0.461***
	(1.344)	(1.346)	(0.504)	(0.273)	(0.132)
Constant	0.0478	0.0229	0.0218	0.0345	0.0852***
	(0.0686)	(0.0674)	(0.0448)	(0.0378)	(0.0280)
Observations	119	119	117	114	108
R-squared	0.132	0.126	0.111	0.159	0.196

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table D.3: The Two-Stage Composite Investor Sentiment Index as a Leading Indicator for SET100

$$\text{SET100 Excess Return}_{t+h} = \beta_0 + \beta_1 ISI_t + \beta_2 \text{SET100 Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h}$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.217**	0.0327	-0.0272	-0.0478	0.0236
	(0.0864)	(0.0820)	(0.0613)	(0.0452)	(0.0480)
SET100	0.153	0.234**	0.203*	-0.0966	-0.280***
	(0.0964)	(0.0939)	(0.114)	(0.101)	(0.101)
dln(volp)	9.415***	8.225***	1.744**	1.997***	1.028***
	(1.965)	(1.976)	(0.852)	(0.420)	(0.237)
Constant	0.178**	0.0719	0.0556	0.0740	0.163***
	(0.0892)	(0.0887)	(0.0648)	(0.0521)	(0.0516)
Observations	102	102	98	92	80
R-squared	0.228	0.179	0.119	0.237	0.297

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table D.4: The Two-Stage Composite Investor Sentiment Index as a Leading Indicator for SET50

$$\text{SET50 Excess Return}_{t+h} = \beta_0 + \beta_1 ISI_t + \beta_2 \text{SET50 Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h}$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.217**	0.0327	-0.0272	-0.0478	0.0236
	(0.0864)	(0.0820)	(0.0613)	(0.0452)	(0.0480)
SET50	0.153	0.234**	0.203*	-0.0966	-0.280***
	(0.0964)	(0.0939)	(0.114)	(0.101)	(0.101)
dln(volp)	9.415***	8.225***	1.744**	1.997***	1.028***
	(1.965)	(1.976)	(0.852)	(0.420)	(0.237)
Constant	0.178**	0.0719	0.0556	0.0740	0.163***
	(0.0892)	(0.0887)	(0.0648)	(0.0521)	(0.0516)
Observations	102	102	98	92	80
R-squared	0.228	0.179	0.119	0.237	0.297

Note: *** p<0.01, ** p<0.05, * p<0.1

Appendix E The Excess Investor Sentiment Index as a Leading Indicator for Market Return

Table E.1 : The Two-Stage Composite Investor Sentiment Index as a Leading Indicator for mai

$$\text{mai Excess Return}_{t+h} = \beta_0 + \beta_1 ISI^{\perp}{}_t + \beta_2 \text{Market Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h},$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.0110	-0.00134	-0.0522	-0.118***	-0.0975***
	(0.0611)	(0.0586)	(0.0405)	(0.0322)	(0.0228)
mai	0.297***	0.301***	0.317***	0.160*	-0.278***
	(0.0944)	(0.0924)	(0.0924)	(0.0872)	(0.0660)
dln(volp)	2.355*	2.348*	0.700	0.382	0.0648
	(1.390)	(1.382)	(0.555)	(0.306)	(0.144)
Constant	0.0161	0.0180	0.0418	0.0557	0.103***
	(0.0699)	(0.0694)	(0.0481)	(0.0382)	(0.0270)
Observations	108	109	109	109	108
R-squared	0.106	0.108	0.114	0.126	0.261

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table E.2 : The Excess Investor Sentiment Index as a Leading Indicator for SET

$$SET\ ExcessReturn_{t+h} = \beta_0 + \beta_1 ISI^{\perp}{}_t + \beta_2 \text{SET Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h},$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.0387	0.00222	-0.0579	-0.0893***	-0.0547**
	(0.0632)	(0.0583)	(0.0390)	(0.0310)	(0.0210)
SET	0.188*	0.211**	0.249**	-0.00389	-0.256***
	(0.0957)	(0.0906)	(0.0960)	(0.0919)	(0.0784)
dln(volp)	4.791***	4.782***	1.289**	1.067***	0.444***
	(1.378)	(1.373)	(0.514)	(0.277)	(0.130)
Constant	0.0429	0.0480	0.0597	0.0779**	0.107***
	(0.0694)	(0.0692)	(0.0448)	(0.0361)	(0.0258)
Observations	108	109	109	109	108
R-squared	0.138	0.134	0.126	0.162	0.206

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table E.3 : The Excess Investor Sentiment Index as a Leading Indicator for SET100

$$SET100\ ExcessReturn_{t+h} = \beta_0 + \beta_1 ISI^{\perp}{}_t + \beta_2 \text{SET100 Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h}.$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.176*	0.0580	-0.00666	-0.0653	-0.0321
	(0.0910)	(0.0833)	(0.0600)	(0.0439)	(0.0376)
SET100	0.162	0.231**	0.194*	-0.0649	-0.250**
	(0.103)	(0.0972)	(0.114)	(0.100)	(0.0970)
dln(volp)	9.531***	8.593***	2.241***	2.110***	0.990***
	(2.065)	(2.034)	(0.846)	(0.419)	(0.237)
Constant	0.102	0.0873	0.0941	0.107**	0.134***
	(0.0823)	(0.0826)	(0.0568)	(0.0445)	(0.0336)
Observations	91	92	90	87	80
R-squared	0.227	0.197	0.148	0.259	0.301

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table E.4: The Two-Stage Composite Investor Sentiment Index as a Leading Indicator for SET50

$$\text{SET 50 Excess Return}_{t+h} = \beta_0 + \beta_1 ISI^{\perp}{}_t + \beta_2 \text{SET50 Excess Return}_t + \beta_3 ln\left(\frac{VOLP_t}{VOLP_{t-h}}\right) + \epsilon_{t+h},$$

Horizon :	0 month	1 month	3 months	6 months	12 months
ISI	0.0377	-0.00445	-0.0601	-0.0849***	-0.0496**
	(0.0673)	(0.0617)	(0.0409)	(0.0316)	(0.0204)
SET50	0.158	0.179*	0.201**	-0.0631	-0.304***
	(0.0958)	(0.0903)	(0.0953)	(0.0892)	(0.0746)
dln(volp)	5.549***	5.555***	1.583***	1.230***	0.578***
	(1.460)	(1.452)	(0.536)	(0.281)	(0.127)
Constant	0.0446	0.0487	0.0583	0.0809**	0.109***
	(0.0736)	(0.0732)	(0.0466)	(0.0368)	(0.0250)
Observations	108	109	109	109	108
R-squared	0.144	0.141	0.130	0.191	0.273

Note: *** p<0.01, ** p<0.05, * p<0.1

Appendix F List of Historical Major Events

2005
Rising interest rates had insignificant effects on corporate balance sheets, since corporate debt had continually declined compared to pre-crisis levels. In the same way, the effects of high oil prices were minimal since the Thai capital market was dominated by energy and banking sectors. In the energy sector, most companies were only slightly affected by higher oil prices since they could pass the higher crude oil prices they had to pay in the world market on to consumers. Moreover, evidence that the Thai government could effectively control the current outbreak of bird flu improved investors' confidences
2006
Even though the political situation, higher oil prices, flooding agricultural areas, and unrest in the southern provinces affected the capital market, their overall impact was relatively limited compared to the dramatic effect of the Bank of Thailand (BOT)'s announcement on December 18,2006 of a reserve requirement on short-term capital inflows. However, BOT's subsequent exemption of equities investment led to a partial recovery of the SET index, which finished the year at 679.84 points, a year-on-year (y-o-y) decrease of 5% from 713.73 points at end-2005. The mai index closed at 193.45 points at end-2006, a heady 22% increase from the 158.23 points at end-2005.
2007
In 2007, the market was affected by the country's economic slowdown and foreign investment was discouraged by the Bank of Thailand's announcement, on December 19, 2006, requiring a reserve requirement on short-term capital inflows. Historic global oil price rises to almost USD 100 per barrel also impacted the capital market negatively. The market experienced uncertain local political conditions, a depreciating US dollar and some knock-on effects of the subprime mortgage crisis in the United States. Despite these circumstances, the Thai market benefited from strengthening Asian economies and attracted huge foreign investment.
2008
25 Jan 2008 Cut in Fed fund rate expected. Actual rate cut in Jan was 1.25%. SET Index closed at 759.72 points, up 31.14 points
29 Jan 2008 Samak Sundaravej was elected prime minister. SET Index closed at 754.87 points, up 10.51 points

29 Feb 2008 Bank of Thailand lifted its 30% unremunerated reserve requirement on short-term capital inflows. AIG (in the US) announced its USD5.29 b loss for Q4/07. SET Index closed at 845.76 points, up 3.64 points
18 Mar 2008 Fed cut its rate by 75 bps to 2.25%. SET Index closed at 812.32 points, up 5.58 points
21 May 2008 SET Index closed at its peak for the year of 884.19 points, up 10.37 points
26 May 2008A day after anti-government protests began. SET Index closed at 856.80 points, down 18.79 points
Aug 26 : After protestors seized the Government House. SET Index closed at 668.92 points, down 9.28 points
Sep 3 : A day after government announced an emergency decree. SET Index closed at 649.93 points, down 9.58 points
Sep 8 : The US government took control of Fannie Mae and Freddie Mac. SET Index closed
at 665.66 points, up 19.86 points
Sep 9 : Somchai Wongsawat was elected prime minister. SET Index closed at 663.61 points, down 2.05 points
Sep17 : Fed offered bridge loan to AIG. SET Index closed at 605.14 points, down 19.42 points
Sep 29 : Bradford & Bingley PLC, Fortis, Hypo Real Estate Holding AG had severe financial difficulties. SET Index closed at 601.29 points, down 17.68 points
Oct 3 : President George W. Bush signed the bill into law authorizing the Secretary of the Treasury to spend up to USD700 b to purchase failing bank assets. SET Index closed at 590.05 points, down 7.64 points
Oct 7 : Police dissolved protests at the Parliament. SET Index closed at 528.71 points, down 23.09 points
Oct 10 : First circuit breaker of the year. SET Index closed at 451.96 points, down 48.03 points
Oct 27 : Second circuit breaker of the year. SET Index closed at 387.43 points, down 45.44 points
Oct 29 : SET Index closed at the lowest of 384.15 points, down 13.89 points
Oct 30 : Fed cut its rate by 50 bps to 1 %. SET Index closed at 408.31 points, up 24.16 points
Nov 25 : Protestors closed Bangkok's two airports. SET Index closed at 391.85 points, up 5.73 points
Dec 3 : Protestors ended demonstrations. SET Index closed at 392.92 points, up 5.60 points

Dec 30 : SET Index at year-end 08 closed at 449.96 points, down 408.14 points (-48%) from year end-07
2009
Jan 13, the decline of world oil prices, together with worsening corporate performances of listed companies in Q4/09 caused the fall of energy stock prices as well as the overall Index. SET Index closed at 433.81 points, down 18.99 points
Jan 16, the European Central Bank (ECB) decided to cut the interest rate to 2%, the lowest level since December 2005. SET Index closed at 435.20 points, up 8.94 points
Feb 2, U.S. Commerce Department announced Q4/09 GDP fell 3.8% YoY, the biggest contraction rate of GDP growth during past 27 years since Q1/82. SET index closed at 427.85 points, down 9.84 points
Apr 2, improvement of key US industrial and employment indices contributed positively to Asia stock markets. SET Index closed at 442.96 points, up 12.87 points
April 16, Political protests on the first day after Songkran did not affect the SET Index The Trading value increased to THB 22,149 million. SET Index closed at 452.97 points, down 0.91 points
May 7, 19 largest commercial banks the in U.S. passed the stress test, raising hope for global economic recovery. SET Index closed at 527.72 points, up 4.57 points
June 15, the European Central Bank (ECB) stated that the risk to the eurozone banks was still high.SET index closed at 611.92 points, down 16.63 points
July 17, Performance of big financial firms in U.S. beat market's forecast. SET Index closed at 596.11 points, up 13.37 points
Aug 17, The U.S. Consumer Confidence Index (CCI) in August plunged to its lowest level since March 2009, lower than market expectation. Meanwhile, domestic political concern was aggravated by demonstrations. SET Index closed at 632.05 points, down 22.20 points
Sep 7, G20 countries confirmed to continue using economic stimulus plan. SET Index closed at 682.57 points, up 14.16 points
Sep 30, The Administrative Court suspended 76 projects in Map Ta Phut industrial estate; nevertheless, bank and IT stock drove SET Index to edge up at 717.07 points, up 1.78 points
Oct 29, U.S. new home sales in September contracted for the first time in 6 months, contradicting market's expectations. SET Index closed at 690.10 points, down 13.85 points

Nov 27, Dubai State announced the postponement of payment for Dubai World's debt. SET Index closed at 680.37 points, down 5.36 points
Dec 14, Abu Dhabi announced to assist Dubai World. SET index closed at 709.74 points, up 6.10 points
2010
Jan 19 : Political protests started to escalate into prolonged violent confrontations between the protesters and the government. As a result, Thailand was subjected to higher political risk. (The SET Index closed at 736.48 points, down 10.41 points.)
Mar 16 : Given the country's strong economic foundation, Morgan Stanley recommended an "overweight" position on March 15, up from a previous "equal-weight" recommendation. (The SET Index closed at 752.20 points, up 17.37 points.)
April 8 : Given the severe state of emergency in Bangkok Metropolis and nearby provinces, in the evening of April 7, the Thai prime minister declared the Emergency Decree on Public Administration in Emergency Situations to be in effect. The state of affairs eroded investor confidence, as evidenced by a sharp drop in the SET Index, which closed at 783.93 points, down 28.70 points.
April 12 : Troops tried try to clear protestors. Violence erupted, affecting investor confidence. (The SET Index closed at 760.90 points, down 28.76 points.)
May 24 : The SET reopened after halting during May 20 – 21 due to domestic political unrest. (The SET Index closed at 744.31 points, down 21.23 points.)
Jun 21 : The SET Index and other Asian stock indices generally rose in response to the Chinese central bank's announcement that they would gradually allow a more flexible exchange rate for their currency. (The SET Index closed at 806.07 points, up 14.22 points.)
Jul 23 : The fact that only 7 out of 91 commercial banks in Europe failed stress tests boosted investor confidence in the global financial market and led to more investment in risky assets. (The SET Index closed at 840.24 points, up 7.23 points.)
Oct 13 : The Thai Cabinet approved three measures to curb capital inflows and ease the damage from appreciation of the Thai baht. (The SET Index closed at 992.60 points, up 15.52 points.)
Nov 16 : The SET Index and other Asian stock indices dropped due to rising concerns over measures to tackle inflation in China, after the Chinese central bank announced an increase in its benchmark monetary policy rate. (The SET Index closed at 1,000.73 points, down 28.41 points.)

Nov 29 : The Constitution Court dismissed the Election Commission's case seeking dissolution of the Democrat Party, core of the coalition government. (The SET Index closed at 1,009.00 points, up 17.29 points.)
Dec 20 : The SET Index and other Asian stock indices declined due to escalating tension in the Korean Peninsula. (The SET Index closed at 1,006.51 points, down 15.95 points.)
2011
Jan 24: Foreign investors took profit from major Asian stock exchanges after a long index rally in 2010. Also, political protests in Egypt between protesters and the government intensified. (SET Index closed at
963.68 points, down 42.89 points)
Feb 10: Egyptian protests escalate into prolonged violence, and investors worried about expansion of political protests in North Africa and Middle East, which would raise oil prices. (SET Index closed at
949.09 points, down 20.80 points)
Mar 11: Investors worried that Japanese earthquake and subsequent tsunamis might affect global economic expansion. (SET Index closed at 1,007.06 points, down 12.16 points)
Apr 4: Foreign investment rose due expectations of improving performance of Thai listed companies in Q1/2011. (SET Index closed at 1,078.66 points, up 14.31 points)
May 3: Osama Bin Laden killed by US forces, relieving terrorist threats and lowering global oil prices. (SET Index closed at 1,070.43 points down 23.13 points)
Jun 8: SET Index and other Asian stock indices dropped in response to concerns about US economic recovery after US Bureau of Labor Statistics announced higher unemployment rates. (SET Index closed at 1,014.58 points, down 20.17 points)
July 4: Yingluck Shinawatra was elected prime minister, resulting in increased confidence among foreign investors towards political stability in Thailand (SET Index closed at 1,090.28 points, up 48.8 points)
Aug 9: S&P downgraded US credit rating from top AAA to AA+ for the first time in history. (SET Index closed at 1,042.54 points, down 35.65 points)
Sep 26: Investors switched from securities to less risky assets in response to Greek bailout plan, which was still in doubt after the EU-IMF conference ended. (SET Index closed at 904.06 points, down 54.1 points)

Oct 6: European Central Bank (ECB) provided liquidity of 40 billion Euro into its bond market to ease the Eurozone sovereign debt crisis. (SET Index closed at 913.72 points, up 51.07 points)
Nov 8: Silvio Berlusconi resigned as prime minister of Italy. (SET Index closed at 983.44 points, up 27.42 points)
Dec 1: 6 major central banks (Fed, BoE, ECB, BoJ, Bank of Canada, Swiss National Bank) mutually agreed to provide liquidity to commercial banks in EU through a "dollar swap". (SET Index closed at 1,019.15 points, up 23.82 points)
2012
1 Jan: Effective the new corporate tax rate at 23%, lower than year earlier, for Thai listed companies.
26 Jan: The FED decided to keep the target range for the federal funds rate at 0 to 0.25% and maintain it at low levels at least through 2014 in order to support a stronger economic recovery.
19 Feb: Greece's cabinet approved 325 million euros of extra austerity measures needed to complete a 3.3 billion euro package of spending cuts according to the requirement of the EU/IMF bailout plan.
29 Feb: U.S. GDP in the 4th quarter of 2011 increased by 3% compared to the previous quarter. It is the highest growth since the second quarter of 2010.
16 Mar: FTSE Group upgraded the Thai capital market from the Secondary Emerging Market status to the Advanced Emerging Market status in the FTSE Global Equity Index Series.
8 May: The fact that the left-wing, anti-austerity Syriza party of Greece might be able to form a governing majority could have an adverse effect on the plan to resolve the European crisis and increased the prospect of the nation leaving the euro zone.
15 May: After the Syriza party failed to form a government, Greece would hold a new election in June.
8 Jun: Euro zone finance ministers agreed to lend Spain up to 100 billion euros to support its teetering banks.
17 Jun: The new government in Greece helped restore the investor confidence in the world capital market.
7 Aug: Germany's government supported the ECB plan to intervene the bond markets in the Euro zone as a way of pushing down borrowing costs for businesses.
6 Sep: The ECB approved a plan paving the way for the bank to make unlimited purchases in struggling euro members' bond markets.

13 Sep: The FED launched QE3 with unlimited size and timeframe.
19 Sep: The BOJ expanded its government bond-purchase fund to 10 trillion yen.
9 Oct: The IMF revised down its projections for global economic growth from 3.4% to 3.3% in 2012 and from 3.9% to 3.6% in 2013.
16 Oct: With upside risk to inflation contained but uncertainties surrounding the global economy remained high, the BOT reduced the policy rate by 0.25% to 2.75% to ward off the negative impact from the weak global economy.
7 Nov: After being re-elected as a US president for a second term, Barack Obama offers first compromise in 'fiscal cliff' battle with Republicans.
14 Nov: The MSCI Inc. added 4 Thai stocks to MSCI Global Standard Indices. As a result, the Thai stocks market weighted at 3.24% in MSCI AC Asia ex-Japan, up from 2.66% at the end of 2011.
13 Dec: the Fed announced $45 billion in the monthly treasury bond purchases. Together with the QE3 measures, this would result in an additional USD 85 billion per month in money markets.
16 Dec: The major stock market indexes around the world reacted positively to the landslide victory of the Liberal Democratic Party in the Japan's lower house general election and its macro stance of more economic stimulus.
2013
SET Index +5.91% m-o-m, China's GDP Q4/12 grew for the first time in the last 2 years. Moreover, U.S. congress temporary passed the debt ceiling bill.
Feb: SET Index +4.57% m-o-m. In Q4/12, Thai's GDP increased 18.9% y-o-y, and Thai listed company's earning announced growth as well.
Mar: SET Index +1.26% m-o-m. Fitch upgraded foreign currency long-term issuer default rating from BBB to BBB+.
Apr: SET Index +2.36% m-o-m. U.S. unemployment rate in March 2013 dropped from 7.7% to 7.6%. PMI of major economies (e.g. U.S., China and Japan) had weakened.
May: SET Index -2.24% m-o-m. Global investors expected QE tapering due to development in labor market and slightly increase in GDP.
Jun: SET Index -7.05% m-o-m, FED decided to remain QE program but may start tapering in 2014.
Jul: SET Index -1.98% m-o-m, BOT revised down GDP growth in 2013 from 5.1% to 4.2%.

Aug: SET Index -9.05% m-o-m, Group of protestor started to rally on Thai political issues. Thai's GDP growth decelerated to 2.8% yoy in Q2/13.
Sep: SET Index +6.87% m-o-m. Thai congress approved THB 2 trillion infrastructure development plan.
Oct: SET Index +4.32% m-o-m, Public debt issue and U.S. government shut down were relieved while there was no sign of QE tapering in the short term.
Nov: SET Index -4.97% m-o-m. Economic indicators showed strong signs of recovery in U.S., Japan and E.U. Thai's GDP in Q3/13 increased only 2.7% yoy (lowest in the past 6 quarters). Political situation became more intense due to expansion of protestors.
Dec: SET index closed at 1,298.71 points -5.28% m-o-m and -6.70% y-o-y. FED decided to reduce USD 10 billion of QE program to USD 75 billion per month. Thai Priminister, Yingluck, dissolved the parliament and set 2 Feb 2014 to be an election day.
2014
Jan: SET Index -1.88% FED announced additional USD 10 billion QE tapering beginning in February. Political tensions increased and protesters shut down and occupied Bangkok.
Feb: SET Index +4.01%. In Q4/13, Thai's GDP increased 0.6%, beat the expectation of 0.3%.
Mar : SET Index +3.84%. MPC decided to cut policy rate by 0.25 bps to 2.0%. FED expected to delay further QE tapering according to the high unemployment rate reported.
Apr : SET Index +2.81% China's GDP Q1/14 grew 7.4%.
May: SET Index +0.06%. Thai court ordered PM and several ministers to step down. Thai military launched a coup on May 22, 2014.
Jun: SET Index +4.95%. ECB cut its refinancing rate from 0.25% to 0.15% and announced a negative 0.1% deposit rate.
Jul: SET Index +1.12%. The S&P 500 index (1,962) and Down Jones Industrial Average (16,947) hit new record highs. U.S. jobless claims reached their lowest level since 2007.
Aug: SET Index +3.94%. Thailand 's junta leader Prayuth Chan-ocha named the new prime minister. The government approved a state budget plan for the next fiscal year; spending projected.
Sep: SET Index +1.54%. ECB has cut the benchmark rate to 0.05%. A new Thai government was formed and announced the economic stimulus package.
Oct: SET Index -0.10%. IMF cut its global growth forecast to 3.3% in 2014 and 3.8% in 2015.

Nov: SET Index +0.62%. Bank of Japan expanded its monetary stimulus measures to JPY 80 trillion a year. Japan PM called a snap election and announced a delay in consumption tax hike. Total market capitalization of SET and mai, on 27 Nov 2014, increased to THB 15.1 trillion, all time high for the Thai stock market.
Dec: SET Index closed at 1,497.67 points, -6.04% but +15.32%. OPEC leaved production targets unchanged; Crude oil fell to the lowest level since 2010. Russian ruble sharply depreciated. Trading value increased to the highest of the year at THB 102,683 million from global economic uncertainties.