

The Stock Exchange of Thailand

Faculty of Economics, Thammasat University

Project Update: Construction of the Investor Sentiment Index (ISI)

Siriyos Chuthanondha

Sicha Thubdimphun

Teerawut Sripinit

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Stock Exchange of Thailand

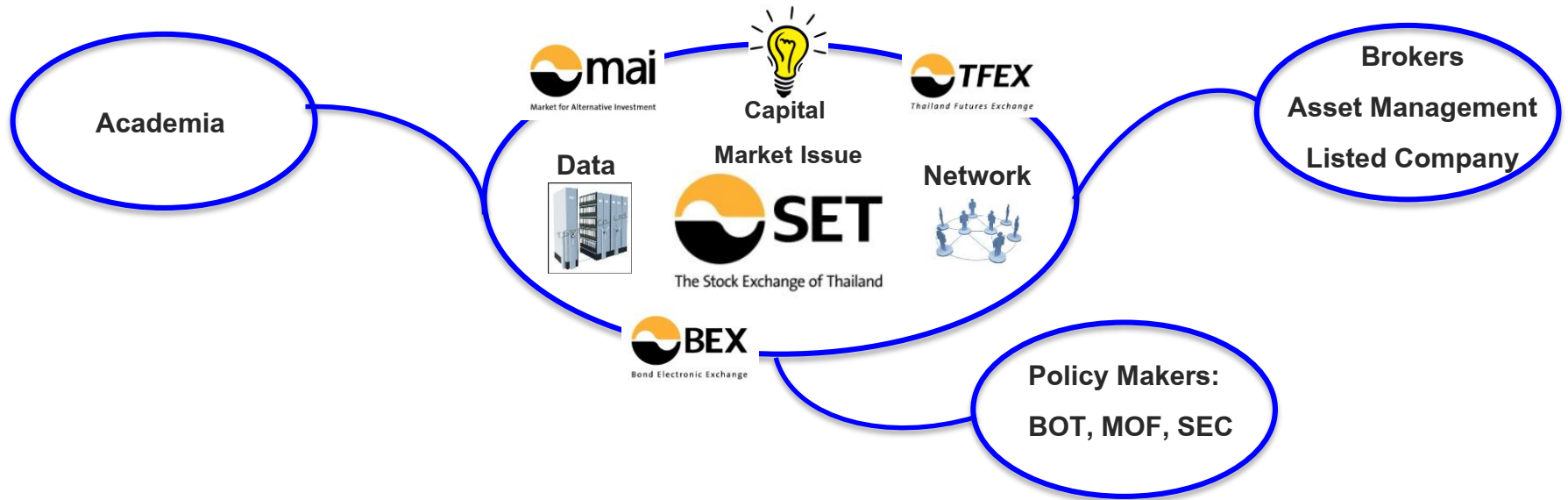
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Background

Capital Market Research Institution (CMRI) plans to be recognized as a leader research house and data centre for capital market development research



Research Question

What is in the stock market ?



Fundamental

Free Cash Flow to Equity

ROE

Price to Earning ratio

Leverage

Net Profit

Sales

Debt to equity

EBITDA

Net Cash Flow

Sentiment



How sentiment affects stock market



Positive Sentiment

- FED announced QE program
- U.S. congress passed the debt ceiling bill
- GDP increased over market expectation
- Cabinet issued new investment plan for mega project



???

- MPC decided to cut policy rate
- Crude oil price decline significantly
- Military launched a coup
- New prime minister was elected
- China stock index crash



Negative Sentiment

- IMF cut its global growth forecast
- Export growth was the lowest in the last 8 months
- Central bank issued capital control measure
- Greece default on ECB debt

How to capture sentiment

What is the practical model should be?

1. Aggregate behavior
2. Transparent (e.g. methodology, data)
3. Efficiency (e.g. fast, inexpensive)

Survey Base	Market Base
Pro • Best way to find out what people are thinking • Simple, no need a complicated model • Most popular • Can ask some other question ex. why you think so	Pro • Highly aggregate • No need to design a questionnaire • Very fast • Less costly • Long series of index available
Con • Subject to bias by respondents • Less aggregate (depend on sample size) • Take more time • More costly	Con • Lack of data • Poor data quality • Subject to model risk • Many assumption was made

How to capture sentiment

Our study follows Baker and Wurgler 2007, a well-established research in constructing the investor sentiment index for the US stock market. The index was constructed from data on US stock market, and it demonstrated how investor sentiment changed during 1987 – 2007. This index was widely quoted in academic and financial industry research.

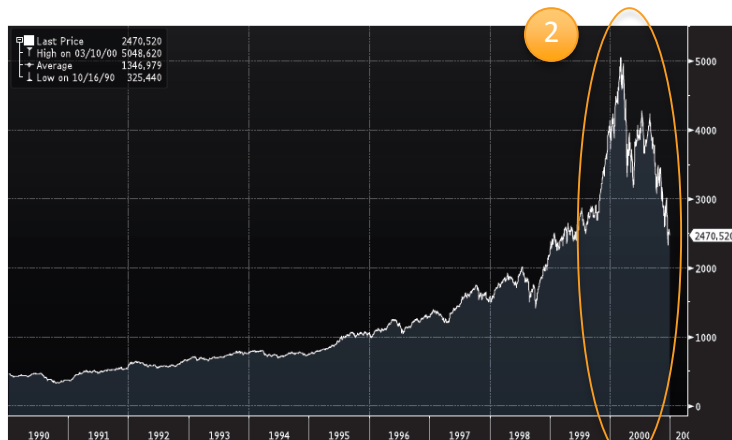
DJI Index (Dow Jones Industrial Average - DJI)

Bloomberg

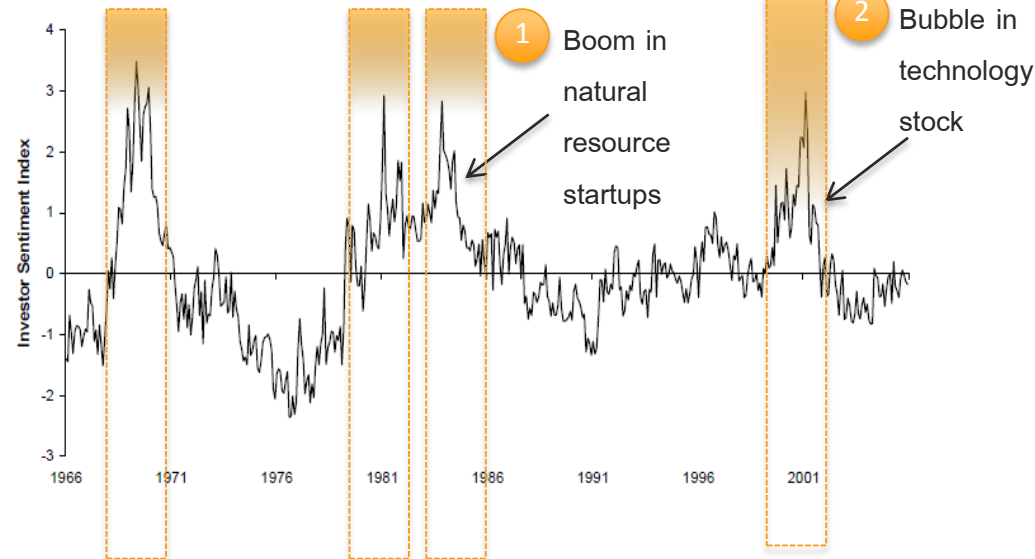


CCMP Index (NASDAQ Composite Index)

Bloomberg



$$SENT = -0.23CEFD + 0.23TURN + 0.24NIPO + 0.29RIPO - 0.32PDND + 0.23S$$



Potential proxies

The potential proxies can be classified into 5 groups as following

Group 1. Macroeconomics

Consumer Confidence Index (CCI)

Group 2. Issuer side

Number of IPO

First day return of IPO

Equity new to total equity and debt new issue

Group 3. Investor side

Net trading value of each investor type

% of trading value of each investor type

Active rate

Number of trading account

Group 4. Price effect

Closed end fund premium

Dividend premium

Volatility premium

Group 5. Risk Factor

Turnover

Number of stock in cash balance account

Long/ short future ratio

Potential proxies

Corredor et al (2013)

1. Turnover
2. Volatility premium
3. Consumer Confidence Index

Baker and Wurgler (2007)

1. Number of IPO
2. First day return of IPO
3. Turnover (volume)
4. Equity new issue
5. Closed-end fund Premium
6. Dividend premium



Variable definition (Baker Wurgler 2007)

Name	Definition	Source/ availability
Turnover (+)	Annualized daily average trading volume of each month (Daily average trading volume for the month * trading day in year)/ Total Share outstanding of the month	Data is available in SET data base since inception (1975 -2015)
Number of IPOs (+)	Number of IPO stocks traded each month	
Average IPO first-day returns (+)	Monthly average of % change of IPO stock at IPO price to close price at the first day trade	
Equity share in new issues (+)	Total equity issuance value in secondary market compare to total debt issuance value each month	Data is available in BOT website since (2000 - 2015)
Dividend premium (-)	Monthly average of difference between M/B ratio (market cap/ total asset) of dividend payer and non-dividend payer, which dividend payer must be the stock that pay dividend at least 5 year continuously)	Data is available in SET data base since (2000 - 2015)
Closed-end fund premium (+)	Monthly average of difference between price of listed closed-end fund and its NAV divided by NAV.	No data for closed end fund price, NAV from SEC.

Variable definition (Corredor et al 2013)

Name	Definition	Source/ availability
Turnover (+)	Annualized daily average trading volume of each month (Daily average trading volume for the month * trading day in year)/ Total Share outstanding of the month	Data is available in SET data base since inception (1975 -2015)
Consumer confidence index (CCI) (+)	Consumer confidence index (CCI) of each month	Data is available in UTCC website since 1998-2015
Volatility premium (+)	Monthly average of difference between M/B ratio (market cap/ total asset) of 30% top and 30% bottom in term of volatility	Data is available in SET data base since (2000 - 2015)

Variable definition (new variables for SET)

Name	Definition	Source/ availability
Net trading value of each investor type	Sum of monthly net trading value of each investor type	Data is available in SET data base since inception (1975 -2015)
% of trading value of each investor type	Proportion of monthly trading value of each investor type to total trading value	
Number of active account (+)	Number of accounts which has at least 1 transaction in each month. (data lag 1 month behind)	Report from brokers to SET starting in 2008
Turnover trading value (+)	Annualized daily average trading value of each month (Daily average trading value for the month * trading day in year)/ Total trading value of the month	Data is available in SET data base since inception (1975 -2015)
Ratio of long short future by investor type (+)	Number of long contract divided by number of long + short contracts of foreign/ institution/ retail investor in each month	Data is available in SET data base since 2011-2015
Number of stocks in cash balance (+)	Number of stocks in cash balance of each month	Data is available in SET data base since 2013-2015

Potential proxies

Corredor et al (2013)

1. Turnover
2. Volatility premium
3. Consumer Confidence Index

Baker and Wurgler (2007)

1. Number of IPO
2. First day return of IPO
3. Turnover
4. Equity new issue
5. Closed-end fund premium
6. Dividend premium

Siriyos, Sicha , Teerawut (2015)

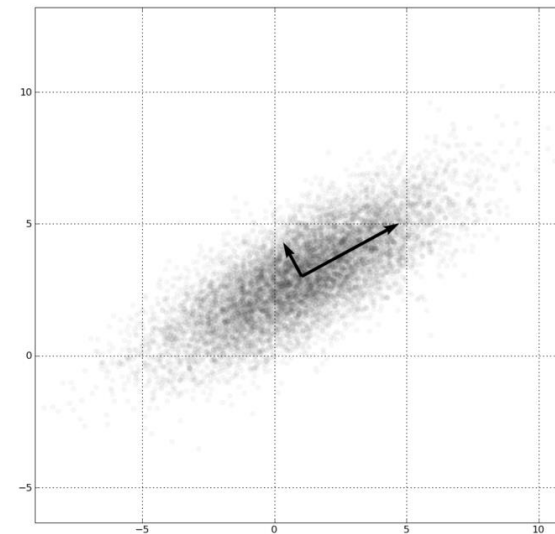
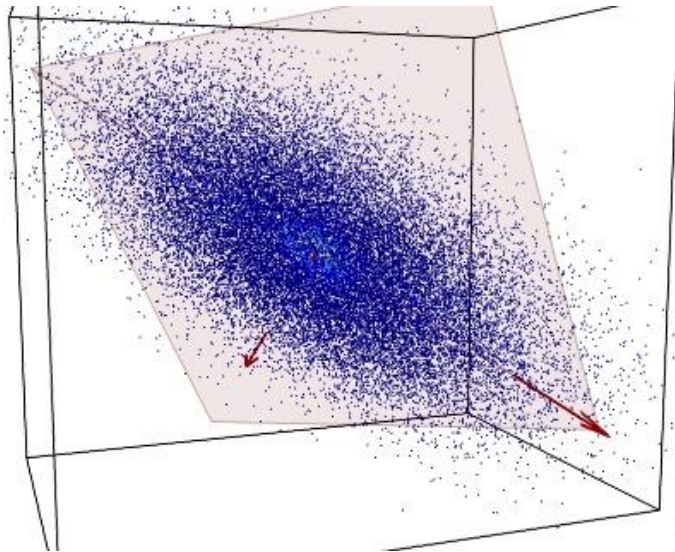
1. Turnover
2. Number of IPO
3. Net value of foreign investor trade
4. Equity new issue



Methodology:

Principal Component Analysis (PCA)

- PCA is the linear combination of the variables with the coefficients chosen to capture as much of the joint variation across series as possible.
- PCA analyzes all the variance in the variables and recognizes it into a new set of components equal to the number of original variables.



Pre- ISI

- Proxies and it's lag.

ISI

- selected lag proxies.

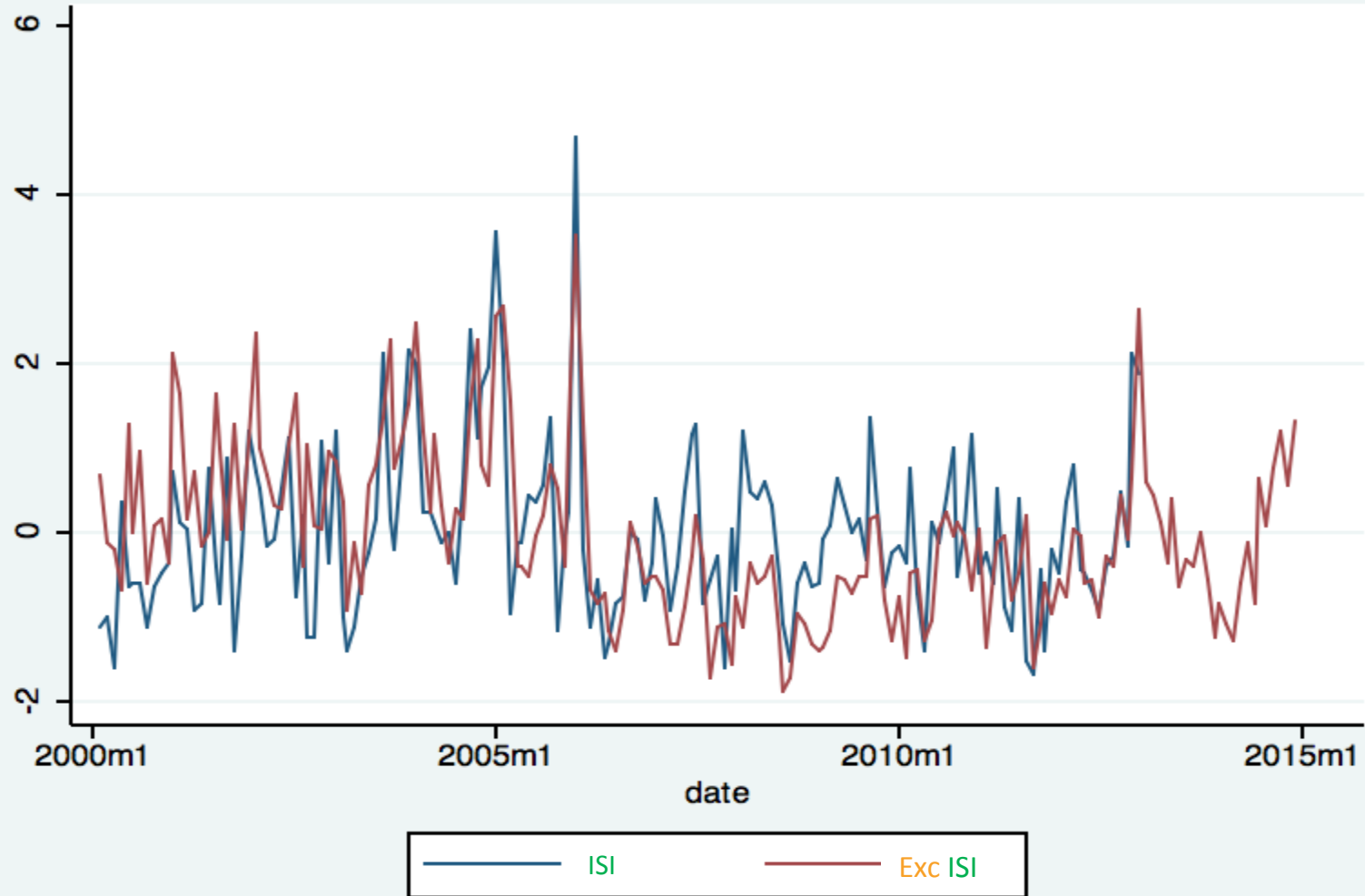
$$\text{ISI} = 0.37 \text{ Number of IPOs Stock (lag)} + 0.58 \text{ Trading Volume Turnover} + 0.65 \text{ Share of Equity Issues in Total Equity and Debt Issues (lag)} + 0.31 \text{ Foreign Investor Net Buy Value to Total Trading Value}$$

Excess ISI

- Remove Business Cycle Components

Industrial PI, Durable Goods Prices, Nondurable Goods Prices, Employment Rate

Compare **ISI** with **Excess ISI**



In-Sample Predictability

Theory :

- Sentiment and Subsequent Market Excess Return
- Sentiment and Market Capitalization

$$\text{Market Excess Return}_{t+h} = \beta_0 + \beta_1 \text{Investor Sentiment Index}_t + \beta_2 \text{Market Excess Return}_t + \beta_3 \log \text{ difference of volatility premium} + \text{residual}_{t+h}$$

	mai	SET	SET50
	beta1	beta1	beta1
0	0.0143	0.0551	0.058
1	-0.0289	-0.019	-0.0248
3	-0.0692*	-0.0652*	-0.0680*
6	-0.121***	-0.0851***	-0.0792**
12	-0.0794***	-0.0490**	-0.0424**

Proxy	2000m1 to 2014m12		2000m1 to 2009m12		2000m1 to 2007m12		2008m1 to 2014m12		2010m1 to 2014m12	
	ISI	ISI^	ISI	ISI^	ISI	ISI^	ISI	ISI^	ISI	ISI^
Number of IPO	y	y	y	y	y	y	y	y	y	y
Turnover (volume)	y	y	y	y	y	y	y	y	y	y
Equity new issue	y	y	y	y	y	y	y	y	y	y
Net buy/sell of foreign	y	y	y	y	y	y	y	y	y	y

Out of Sample Test

Extended Windows Estimation

2000m1 to 2011m2	L1NIPO	LDTURN	L1NFBVAL	S
	0.3935	0.5746	0.2545	0.6710
2000m1 to 2012m2	L1NIPO	LDTURN	L1NFBVAL	S
	0.4041	0.5742	0.2261	0.6752
2000m1 to 2013m2	L1NIPO	LDTURN	L1NFBVAL	L1S
	0.4406	0.5455	0.2966	0.6484
2000m1 to 2014m2	L1NIPO	LDTURN	L1NFBVAL	L1S
	0.3702	0.5713	0.3079	0.6647
2000m1 to 2015m2	L1NIPO	LDTURN	L1NFBVAL	L1S
	0.3758	0.5832	0.3121	0.6490

Out of sample RMSE

Model 1

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

Model 2

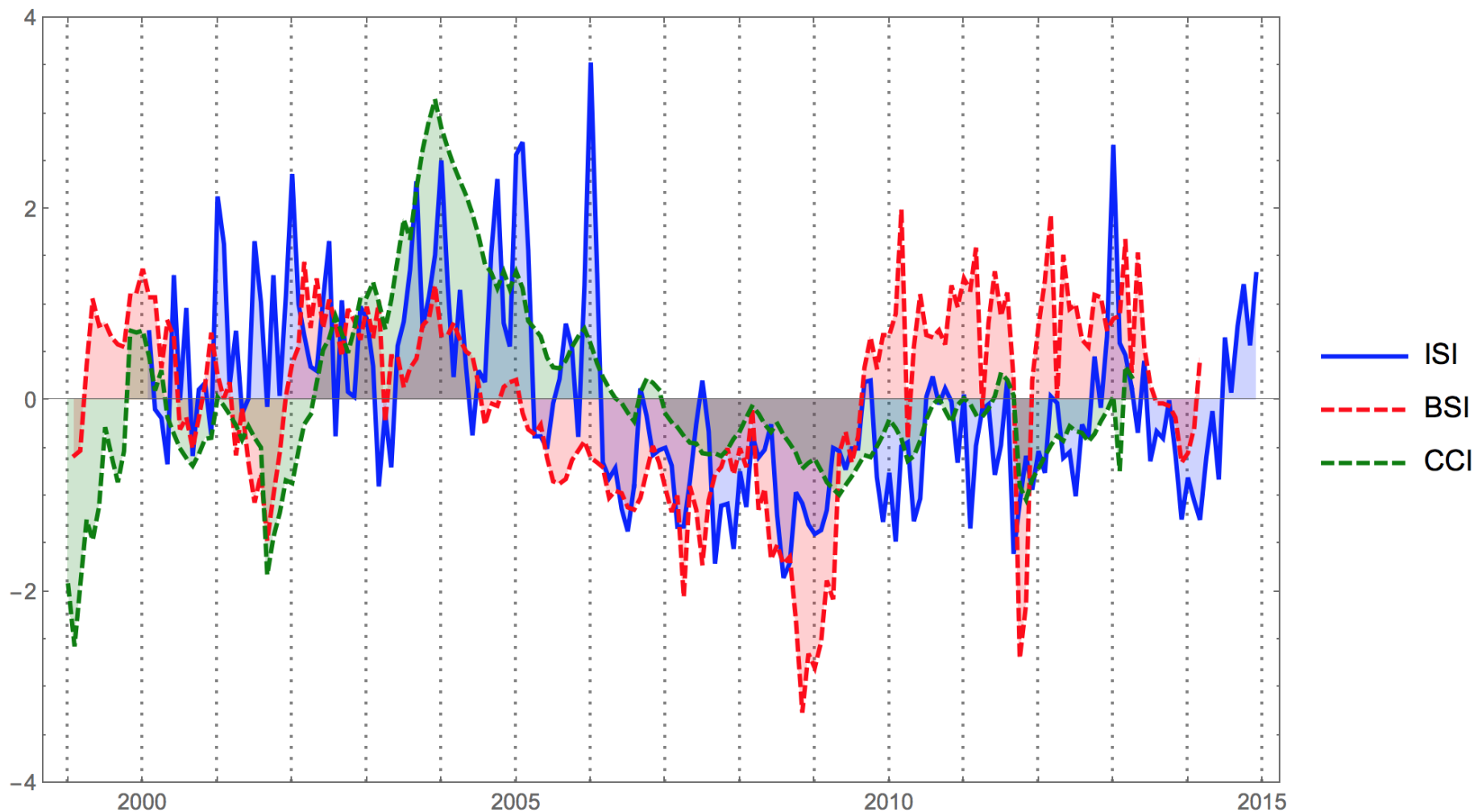
Horizons	0 month	1 month	3 months	6 months	12 months
mai	0.892	0.892	0.657	0.501	0.311
SET50	0.712	0.712	0.441	0.330	0.249
SET100	0.825	0.825	0.550	0.507	0.295
SET	0.700	0.700	0.463	0.350	0.261

Model 1 - Model 2

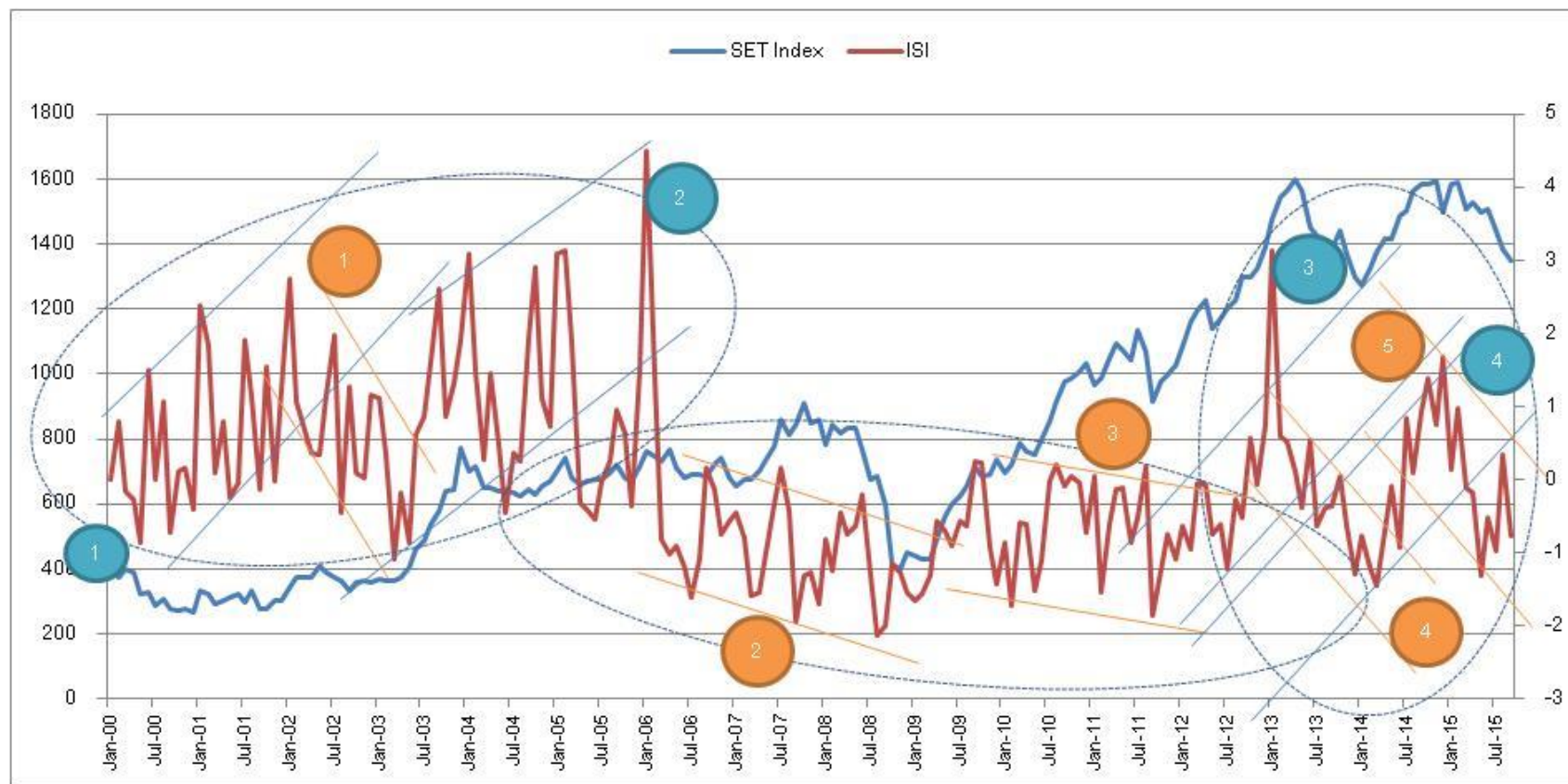
Horizons	0 month	1 month	3 months	6 months	12 months
mai	1.726%	0.282%	-0.273 %	-2.113 %	-1.730 %
SET50	-0.165 %	0.548%	1.453%	2.922%	-2.791 %
SET100	-5.159 %	1.727%	0.937%	-0.767 %	3.468%
SET	-0.058 %	0.675%	1.173%	2.078%	-3.437 %

Investor Sentiment Index

ISI BSI and CCI



Sentiment Cycle



1. Uptrend Jan 2000- Mar 2006, recovered from Tom Yum Kung crisis in 1997

2. downtrend since Apr 2006 - Nov 2012 due to series of political uncertainty (2006-current)

3. volatile period since Dec 2012 -July 2015.

Anecdote for ISI

