HOW CHANGE IN CONSUMER CONFIDENCE
IMPACT THAI STOCK MARKET

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ABSTRACT

This study examines the relationship between changing in consumer confidence and Thai stock market. The research covers both market level and firm level by studying the aggregate market return and abnormal returns as well as incorporating with the trading behaviour by investor type using the event study method and regression model. The result shows that increasing in consumer confidence affect the average market returns positively and will slightly increase when consumer confidence increases during good years with the active trading by retail and foreign investors. The results from firm level study also report that small firms appear to impact with negative abnormal returns when consumer confidence decreases. Moreover, this research finds that stocks in Property & Construction and Resources industry are affected from changes in consumer confidence. Finally, the regression results re-emphasize that the positively relationship between changing in consumer confidence and Thai stock market exist.

KEYWORDS: Consumer confidence / Market returns / Abnormal returns / Size and Industry effect / Thailand
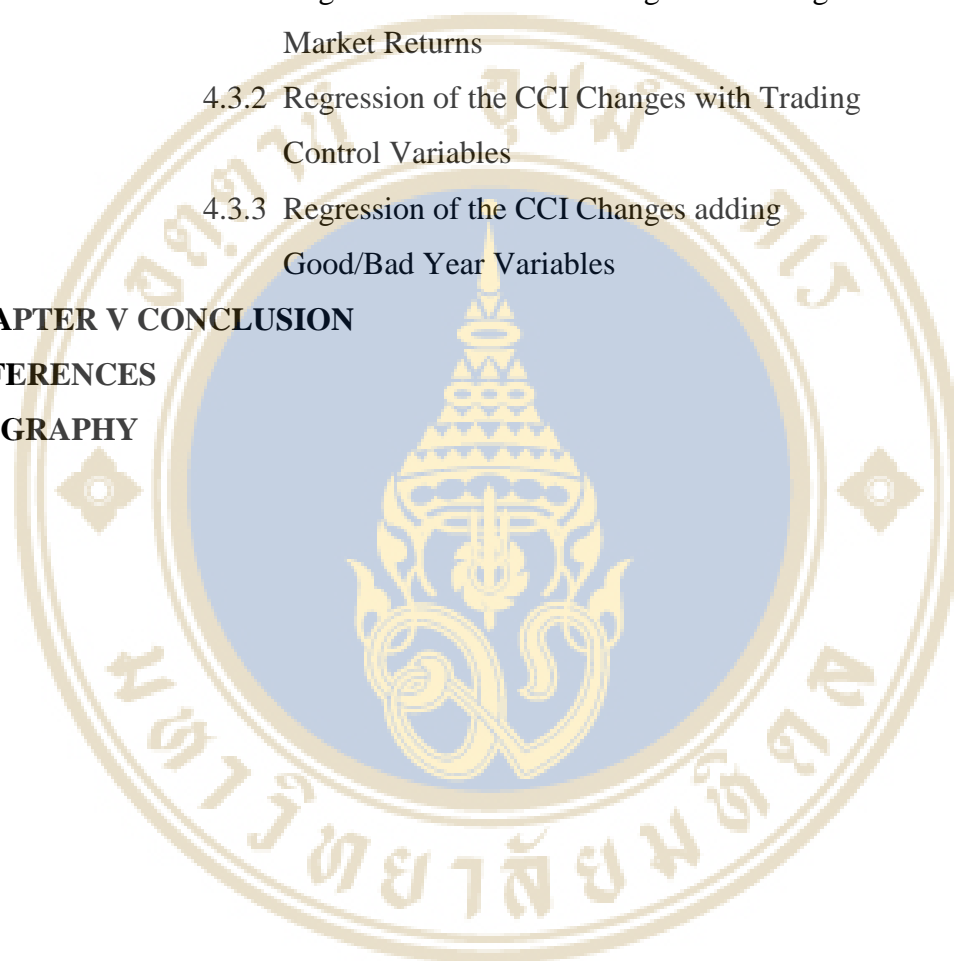
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CHAPTER I
INTRODUCTION

1.1 Sentiment Indicator

Sentiment Indicator is a numerical indicator designed to show how a group feels about the market, business environment or other factor. In term of economic and financial decision, sentiment indicators can be divided into two main group; investor sentiment and consumer sentiment. Both groups, investors and consumers, have expectations. Investors' expectations come into existence via the stock market reflecting how optimism or pessimism can lead to an increasing or declining stock market. On the other hand, consumers' expectations typically come into existence in the form consumption and saving. In essence, if the consumers are optimistic, they will tend to purchase more goods and services, where as, pessimistic consumers tend to save more and spend less. These increase and decrease in spending will inevitably stimulate the whole economy.

Many sentiment researches have focused on how to measure investor sentiment and its interaction with the stock market (e.g., Fisher and Statman (2000), Qiu and Welth (2006), Baker and Wurgler (2006)). Furthermore, Jansen and Nathuis (2003) provide cross-section evidence of the positive correlation between change in sentiment and stock returns. Brown and Cliff (2004) document a contemporaneous relation between investor sentiment and U.S. stock market returns. Ho and Hung (2009) use various measure of investor sentiment as conditioning information in asset pricing models and find that these model specifications often capture the anomalies including the size, value and momentum effects. Chung, Hung and Yeh (2012) demonstrate that investor sentiment predicts the cross-section of stock returns particularly during economic expansionary periods.

In some researches, consumer sentiment has been studied in relation to asset pricing and stock return as investor sentiment. More previous studies have identified that consumer sentiment has explanatory power for predicting changes in

macroeconomic contexts such as current household spending, GDP and consumption growth (e.g., Carroll, Fuhrer, and Wilcox (1994), Matsusaka and Sbordone (1995), Souleles (2004)). Otoo (1999) reports a correlation between stock prices and consumer sentiment. Moreover, Fisher and Statman (2003) present evidence showing that monthly changes in consumer confidence indexes and S&P stock returns exhibit a positively contemporaneous relationship. Lemmon and Portniaguina (2006) document that a measure extracted from the indexes composed by the University of Michigan (MS) and Conference Board (CCI) forecasts the return on small stocks and those stocks with low institutional ownership. Chen (2011) finds that lack of consumer confidence has greater impact on stock returns during times of bear market.

1.2 Motivation of the Study

As mention earlier, consumer confidence index or consumer sentiment index has been widely used in many researches. In the United States, there exist several indicators that measure consumer confidence. The most widely being used are Consumer Confidence Index (CCI) produced by the non-profit business group - The Conference Board since 1967 and another index, the Index of Consumer Sentiment (ICS) produced by the University of Michigan and distributed by Thomson Reuters. In Thailand, nevertheless, most of studies focus on how the stock return interact with the economic factors, for instance, Gross Domestic Product (GDP), Consumer Price Index (CPI), inflation rate, and exchange rate. Apart from economic factors, some researches study the relationship between stock price index against the Construction Material Index (CMI), Private Investment Index (PII), and Business Sentiment Index (BSI). None of those studies spot on the Consumer Confidence Index, whereas, decreasing or increasing in Consumer Confidence Index is becoming the front page news published in many websites for investors. This gives the motivation to study how change in the Consumer Confidence Index impacts Thai Stock Market.

1.3 Research Objectives

After introduction of consumer sentiment in the first chapter, the second chapter presents some evidences from other studies in U.S. and other industrial countries; many results show the relationship between stock returns and changes in consumer confidence (Mark Anthony Johnson (2010), Fisher and Statman (2003), Schmeling (2009)), some further studies include the other factors such as size effect and industry effect and find the different impacts (Baker and Wurgler (2006), Mark Anthony Johnson (2010), Lemmon and Portniaguina (2006).

The third chapter describes the research methodology in order to explore if those reaction exist in Thai stock market by using the event study and the regression model. The study includes both market level and firm level and additionally incorporates with trading behavior reaction. The methodologies are used in order to answer the research questions; i) How change in Consumer Confidence Index impact to the aggregate market returns and any different response between positive and negative change? ii) How different do the market returns react relatively to changing in CCI during good years and bad years? iii) Do changes in CCI appear to impact small firms the same as larger firms? iv) Do changes in CCI impact firms differently in between industry? and v) How change in CCI impact trading behavior by investor type?

The remainder of this paper is the empirical results of study represented in the forth chapter which reports the results starting with the results from the event study on stock returns, following by the results from the event study on trading behavior and lastly showing the results from regression model. This study provides the evidence from both event study and regression method that the relationship between changing in consumer confidence and Thai stock market exist and base on results from event study, there are different reactions resulting from size effect and industry effect as well as the difference in trading behavior by each investor type. Finally, the last chapter contains the conclusion of all findings in this paper.

CHAPTER II
LITERATURE REVIEWS

2.1 Consumer Sentiment, Investor Sentiment and Stock Return

Mark Anthony Johnson (2010) seeks to explore the relationship between stock returns and consumer sentiment to test the prospect theory (Kahneman and Tversky (1979)) and the life cycle investment hypothesis (Modigliani and Brumberg (1954), Modigliani (1986)). Each of these economic theories has the ability to explore with the help of behavioral economic which could provide the data regarding how sentiment varies amongst individuals of different ages that he is interested in. The objective of research is to show how consumer sentiment across different age groups impacts capital markets. The data used is the monthly Consumer Sentiment Index (CSI) for individuals surveyed by the University of Michigan for the sample period begins at the beginning of 1978 and ends in December 2008, resulting in 30 years of monthly time-series data. This data is segmented into three groups; 18 to 34 years old, 35 to 54 years old and persons 55 years old and older. For the excess return, he uses CRSP Value Weighted Market Index and CRSP Equally Weighted Index minus the monthly yield on a 30 day representative Treasury bill appearing in CRSP.

He uses the ordinary least square regressions of one month excess returns of various indices on lagged one month changes in CSI constructing the following model:

$$r_{i,t} = \alpha + \beta \Delta CSI_{t-1} + \varepsilon_t$$

where $r_{i,t}$ is excess returns on index i in time period t computed by the formula, $Index_{i,t}$ – $TBILL_t$ and the change in CSI (ΔCSI) is computed as (CSI_t – CSI_{t-1}) / CSI_{t-1}. The results show the positive relation for both changes in the composite CSI and changes for CSI amongst each age group. These results can be interpreted as a positive change in CSI results in positive future excess stock return. His research also shows that an aging population results in higher average risk aversion and subsequently, higher risk

premiums. An implication of this is that older individuals are more risk averse than younger individuals.

Fisher and Statman (2003) also seek to answer the questions: i) Does consumer sentiment predict stock return? ii) Do stock return affect consumer confidence? and iii) What is the relationship between consumer confidence and investor sentiment? Their research empirically shows that the stock market returns and consumer confidence are significantly related. For their motivation to see the ability of consumer confidence to predict future stock return, they use stock return as the dependent variable and the *level* of consumer confidence as the independent variable and find a negative relationship between the two. Fisher and Statman (2003) additionally present the evidence showing that S&P 500 returns predict monthly *changes* in overall consumer confidence with a positively contemporaneous relationship. Moreover, by using monthly changes in overall consumer confidence as the dependent variable and changes in monthly individual investor sentiment as the independent variable, they find a positive and statistical significant relationship among the two does exist.

2.2 Consumer Sentiment in an International Context

The consumer sentiment and its impact on stock returns have already been studied in an international context. Schmeling (2009) uses consumer confidence as an approximation for individual sentiment to investigate whether lagged sentiment explains stock returns in eighteen industrial countries; Australia, Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United State. Schmeling (2009) hypothesizes that international investor sentiment predicts future aggregate market returns, which the impact of sentiment on returns is stronger for countries that have less well developed markets and are more prone to investor overreaction. In term of specific countries, the result shows that lagged sentiment has a stronger affect on stock return in countries such as Germany, Japan and Italy while there is no evidence or little evidence of such a relationship in countries such as the

Unite Kingdom, Australia and New Zealand. For the United State, he shows this relationship holds between sentiment and some specific characteristic stocks. As a result, he argues that the stock returns in the United State, for the most part, are not affected by sentiment, as some other industrialized countries.

Jerry C. Ho and Chi-Hsiou D. Hung (2012) go a step further to test the ways investor sentiment may influence the conditional volatility of returns in eight developed countries; the U.S., four largest European countries and three Asia-pacific countries. Moreover, in addition to examining the level of investor sentiment, they also allow for the role of the change in investor sentiment may play in the formation of the future market return and volatility. They found that periods of high sentiment level tend to be followed by low aggregate market returns. The negative relationship between current consumer confidence *level* and subsequent excess monthly return is statistically significant not only for the U.S. market but also France and Italy. In Italy such impacts lead to an increase in return by 4.7% in the next month. Their results for the U.S. are in line with those of Lee, Jiang and Indro (2002) who utilize the U.S. data and show evidence that investor sentiment influences conditional volatility. Jerry C. Ho and Chi-Hsiou D. Hung (2012) additionally find an important exception in Japan where the current consumer confidence level boosts the excess market return in the next month. The stock prices are boosted not only in the current month when the market participants are optimistic, but also prices are affected in the following month. In contrast, the *change* in consumer confidence exhibits no predictive power for the subsequent excess stock market return in most of the countries except for Japan again where a positive and statistically significant relation exists.

2.3 Consumer Sentiment affects Returns by Industry

Baker and Wurgler (2006) find that sentiment has more of an impact on non-dividend-paying and extreme growth stocks. Firms that meet these two characteristics are typically technology firms. Mark Anthony Johnson (2010) who has hypothesis that changes in sentiment amongst all age groups should affect technology firms as well as other similar industries. The results show industries that consistency appear in most, if not all age groups, as being affected the most by prior change in

consumer sentiment. Changes in sentiment across age groups tend to affect technologies industries (e.g., Computer industry, Computer Software and Electronic Equipment industries), the Automobile and Trucks industry, the Precious Metal industry and the Retail industry. The technology industries being affected significantly makes sense for him since they are typically the non-dividend paying firms and growth firms which is consistence with Baker and Wurgler (2006). As for the Automobile and Tracks industry and Retail Industry appearing amongst various age groups as being affected by changes in consumer sentiment, Mark Anthony Johnson (2010) gives the explanation that vehicle purchases are sizable purchases for most consumers and possible only second to purchase of a home in term of the magnitude of the purchase price. Therefore, if consumers are optimistic about the future and feel comfortable with their personal finance situation and the economy, they are more likely to purchase a vehicle. On the other hand, if consumers are pessimistic about the future, surely they will delay this purchase. The Retail industry is heavily reliant on consumer spending and the sentiment of their primary customer, consumer, will greatly affect their profitability, and in turn their stock's returns. Lastly the Precious Metal industry can be explained by Mark Anthony Johnson (2010) in that metal such as gold, platinum and silver are also considered 'safe' investments. As a result, they can see flow of investment during both economic expansions and (most likely) economic contraction in order to aid in asset allocation amongst different asset classes.

2.4 Consumer Sentiment affects Returns by Firm Size

Lemmon and Portniaguina (2006) first test the relationship consumer confidence and size premium. They define the size premium as the difference between the return on the smallest deciles portfolio in CRSP portfolios formed based on market capitalization and the returns of the largest deciles. To carry out their size premium test, they regress the return of their size premium portfolio on lagged consumer confidence and some control variables and shows that current levels of sentiment predict the size premium as well as show that stocks with low institutional ownership (small stock) show evidence of mispricing from changes in sentiment. They state the results provide support for the noise trader hypothesis which states that stock returns

for assets held by individuals (noise trader) should be affected more so by sentiment. Baker and Wurgler (2006) also find investor sentiment, which is similar to consumer sentiment, has more of an impact on small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme growth stocks and distressed stocks. Schmeling (2009) performs a Granger causality test using the bivariate relationship of consumer sentiment and stock returns. His results of the test confirm a two-way causality – sentiment depends on previous returns and returns depend on previous sentiment. These results hold for the aggregate market, value stocks and growth stocks. He argues that this provides evidence that is consistent with his hypotheses of sentiment predict future aggregate market returns and sentiment affects being stronger for growth stocks, value stocks and small stocks.

Mark Anthony Johnson (2010) seek further for the impact on small stocks whether this noise trader argument hold amongst changes in consumer sentiment for all ages. By using CRSP market capitalization portfolios, these portfolios are segmented into deciles based on a firm's market capitalization whereby deciles 1 to 2 represent large cap stocks, deciles 3 to 5 represent mid-cap stocks, deciles 6 to 8 represent small cap stocks and portfolios 9 to 10 represent micro-cap stocks. His results show that changes in sentiment affect larger firms' market risk premiums more than smaller firms. This is not in agreement with the noise trader hypothesis. He finds that a 10 % change in overall consumer sentiment (consumers of all ages) forecast a market risk premium change of 4.05 % in the following month for the largest firms versus a market risk premium change of 1.85 % for the smallest firms. He can conclude that this size effect is, for the most part, linear in that the largest firms are affected the most and this effect gradually decreased as firm size decreases. This pattern is true for changes in consumer sentiment for all age groups.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Data and Sample Characteristics

In Thailand, two mainly organizations who produce the Consumer Confidence Index (CCI) are the University of the Thai Chamber of Commerce (UTCC) and the Bureau of Trade and Economic Indices. This research selects the Consumer Confidence Index produced by the University of the Thai Chamber of Commerce (UTCC), considering the news published in the websites for traders, the accessible online data, and the number of sample size, also the supportiveness of UTCC. The sample period covers since November 1998 until December 2011 in which the announcement of Consumer Confidence Index by UTCC is scheduled on the second Thursday of each month. The Index is based on the data from a monthly survey of 2,200 – 2,300 Thai households. The data is calculated for Thailand as a whole consists of people in the capital city – Bangkok and others provinces, both in males and females. The survey consists of seven questions on the following topics: i) current economic conditions, ii) economic conditions for the next six months, iii) current employment conditions, iv) employment conditions for the next six months, v) total family income for the next six months, vi) aggregate economic conditions, vii) aggregate employment conditions. After all surveys are collected, each question's positive, neutral and negative responses are summarized in the percentage then converted into the index values. These index values for all seven questions are averaged together to produce the CCI. The average of index values for questions i and iii form the Present Situation Index, while the average of index values for questions ii, iv and v form the Expectations Index and the average of index values for questions vi, vii and v form the aggregate CCI Index. The CCI value can be in the range of 0 – 200 in which 100 means the consumers feel neutral for the situation, whereas, the value above 100 means they feel positively and the value below 100 means they feel negatively.

Table 3.1 show the CCI index values during the sample period which covers since November 1998 until December 2011 for the total 148 samples. Table 3.1 also reports the changes in each index ($\triangle$ Index) computed by taking the percentage change from prior period. Considering the news published in the websites for investors, this research mainly focuses on the changes of aggregate CCI that is likely to be the most attractive item per the investors' point of view.

TABLE 3.1: Descriptive Statistics
This table presents the index values produced by UTCC based on the data from a monthly survey since November 1998 until December 2011. The index values can be in the range of 0 – 200 in which 100 means the consumers feel neutral for the situation, whereas, the value above 100 means they feel positively and the value below 100 means they feel negatively. The Aggregate Index reflects how the consumers feel for the overall situation. The Present Index reflects how the consumers feel for the current situation. The Expected Index reflects how the consumers feel for the situation in the next six months. The changes in the index value ($\triangle$ Index) are computed by the formula, $(\text{Index}_t - \text{Index}_{t-1}) / \text{Index}_{t-1}$

Variable	Mean	Std Dev	Max	Min	N
Aggregate CCI	81.7264	10.2984	112.4000	52.8000	148
Present CCI	66.7372	17.2296	102.4000	16.9000	148
Expected CCI	86.3797	10.2806	115.4000	63.8000	148
Aggregate Economic	75.5764	12.4090	110.9000	39.7000	148
Current Economic	68.4236	18.0442	106.6000	16.2000	148
Future Economic	82.7304	12.6381	115.9000	63.0000	148
Aggregate Employment	71.8534	11.9566	102.9000	32.9000	148
Current Employment	65.0480	16.7272	98.2000	17.5000	148
Future Employment	78.6527	10.6465	107.6000	44.5000	148
Future Income	97.7574	8.5900	123.3000	82.2000	148
$\triangle$ Aggregate CCI	0.0020	0.0375	0.1761	-0.1728	147
$\triangle$ Present CCI	0.0099	0.0703	0.4921	-0.1783	147
$\triangle$ Expected CCI	0.0009	0.0408	0.2022	-0.1844	147
$\triangle$ Aggregate Economic	0.0029	0.0465	0.2160	-0.1897	147
$\triangle$ Current Economic	0.0114	0.0808	0.4324	-0.2355	147
$\triangle$ Future Economic	0.0000	0.0433	0.1790	-0.1716	147
$\triangle$ Aggregate Employment	0.0051	0.0532	0.4244	-0.1971	147
$\triangle$ Current Employment	0.0089	0.0681	0.5521	-0.1548	147
$\triangle$ Future Employment	0.0037	0.0587	0.3770	-0.2426	147
$\triangle$ Future Income	0.0004	0.0355	0.1764	-0.1502	147

The other data incorporated are stock returns. Firstly, this research mainly focuses on how the aggregate stock market reacts as a result of changes in consumer confidence index. To seek the explanation whether that relationship exist, I obtain the data from SET SMART Database by using the daily %age changes of SET Index as the aggregate market returns. Secondly, this research will seek to further explore which industries are impacted more by the optimism or pessimism of consumers and whether the impacts are significantly deviated from the aggregate market reactions. To answer this question, the abnormal returns by industry can be calculated by using the daily security trading obtained from SET SMART and then grouping into the industries. Furthermore, this research will study whether the firm size has any role in relation to changes in consumer sentiment. Being able to explore this question, the data is also based on the daily security trading obtained from SET SMART and then divided into one of three portfolios based on the market capitalization of the firms. Firms belonging in lower deciles represent smaller firms and firms placed into higher deciles represent larger firms. In other word, the largest firms are placed in the portfolio deciles two and the smallest firms are placed in portfolio deciles zero.

This research seeks to explore not only the reaction on stock returns but also incorporated some part of behavioral investment by examining which investor types are more responsive to the changes in consumer sentiment. To explore this aspect, the data of trading volume by investor types which include Retail Trader, Foreign Trader, Institutional Trader and Proprietary Trader can be gathered from SET SMART for both the aggregate market level and the firm level. All trading data and stock returns are available for the entire sample period.

3.2 Research Methodology

3.2.1 Event Study Method

This research uses the event study method to examine the average market returns (SET Index) reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011. The CCI announcement day and a day after (i.e., day0 and day1) are indicated as an event period in order to explore whether the announcement of changing in CCI has statistically significant impact on

the market returns. The study also includes the reaction during the pre-event period and the post-event period. The pre-event is indicated for the period during twenty days before the announcement day (i.e., day-20 to day-1) in order to examine the investors expectation about CCI and whether it has statistically significant impact on the market returns before the announcement date. On the other hand, the post-event is indicated for the period during twenty days after the announcement day (i.e., day2 to day20) to see if there is investor underreaction or overreaction to the CCI change and whether it is statistically significant on the market returns after the announcement date. The changes in CCI are derived from the %age change of CCI current period compared to CCI prior period. The change in CCI then divided into positive and negative change as a purpose of studying asymmetric response in which situation that the market react between positive and negative change in CCI and whether the reaction is in a positively relationship or in the opposite way.

This research further study the impact of CCI changes on average market returns in good years and bad years. The good or bad year is indicated by the positive or negative cumulative market returns in each year. This study aims to explore how the market reacts to the change of CCI in the good years and the bad years. Besides, it also examines whether the reactions are different when there are the positive changes of CCI in good years versus the positive changes of CCI in bad years as well as how different reactions for the negative changes of CCI in good years versus the negative changes of CCI in bad years. After that, the results will be tested to ensure that good year and bad year are statistically significant difference from zero in order to emphasize that the impact of CCI change on average market returns are statistically different between good year and bad year.

After studying the impact of consumer confidence changes to the aggregate market level, this research further inspects the reaction at firm level. Studying at this level, the cumulative abnormal return during event period is used as the dependent variable and the change of consumer confidence as the independent variable in order to find a relationship between the two. The abnormal return on each stock is computed by subtracting the stock return by SET return, where SET is the aggregate market return. Being able to explore whether the firm size has statistically significant relationship with changes in consumer sentiment, all the data of daily

security trading during the sample period are divided into one of three portfolios based on the market capitalization of the firms. Firms belonging in deciles zero represent small firms while firms placed into deciles one and deciles two represent medium firms and large firms respectively. The results will be subsequently tested to ensure that the three groups by firm size are statistically significant difference from zero in a purpose to emphasize that the reaction of stock returns in relation to CCI change are statistically different between small firms and larger firms..

In addition to firm size, the firms level studying also seek for the explanation of the relationship between the abnormal return of stocks in each industry and changes in consumer sentiment. The abnormal return on each stock that is computed by subtracting its return by SET market return then cumulated during the event period is used as the dependent variable. Instead of dividing all stock returns by the firm size based on market capitalization, the stocks are grouped into eight equally weighted industries. Each stock is defined its industry by an industry code, a sector code and a sub-sector code indicated in the Stock Exchange of Thailand (SET). The stocks under the same industry then will be grouped into one portfolio to represent that industry. There are totally eight industries in the SET market which are Agro & Food Industry, Consumer Products, Financials, Industrials, Property & Construction, Resources, Services, and Technology. These eight-industry portfolios will be explored to see the stock returns in which of them have statistically significant impact resulting from changes in consumer confident index and in addition, the direction of the relationship whether they move along together in the same direction or they are in the opposite way.

Apart from the stock returns, this research includes the event study regarding behavioral investment to examine amongst different investor types which investor types are more responsive to the changes in consumer sentiment as well as in which situation that they react between positive and negative change in CCI. In this part of studying, the trading volume by investor types which are Retail Trader, Foreign Trader, Institutional Trader and Proprietary Trader are incorporated for both the aggregate market level and the firm level. The market trading behavior is determined by trading imbalance of each investor type. The trading imbalance is calculated by the net buy-sell volume divided by the sum of buy and sell volume. Using the same data

of changes in Consumer Confidence Index (CCI) during November 1998 and December 2011, studying the response of each investor type trading at the market level to the CCI changes during event period (i.e., day0 and day1), pre-event period (i.e., day-20 to day-1) ,and post-event period (i.e., day2 to day20). Similarly to the market returns reaction, this study also examines the trading behavior by investor type at the market level how those investor types react to CCI changes in good years and bad years.

Studying the investor trading behavior at firm level, the daily trading volumes by investor type are collected for each firm then determine the trading behavior by using trading imbalance of each investor type. Using the same method of studying the reaction on stock returns, the entire trading imbalance during the sample period are divided into one of three portfolios based on the market capitalization of the firms. Firms belonging in deciles zero represent small firms while firms placed into deciles one and deciles two represent medium firms and large firms respectively. This is aiming to explore whether each investor type trade in the same manner among small firms, medium firms and large firms in reaction to consumer sentiment changes positively and negatively.

Regarding the study of impact by industry, the trading imbalances of each investor type are grouped into eight equally weighted industries using an industry code, a sector code and a sub-sector code of each stock. The trading imbalance of stocks under the same industry then will be grouped into one portfolio to represent that industry. These trading imbalances by industry will be examined in which of them that each investor type have statistically significant reaction resulting from changes in consumer confident index either positively change or negatively change.

3.2.2 Regression Model

In addition to the event study method, this research also incorporates the simple regression model applied from Mark Anthony Johnson (2010), to emphasize whether the changes in consumer sentiment exhibit statistical relationship with the aggregate market return during the event period (the announcement day and a day after). The relationship is estimated by the model constructed as below:

$$\Delta SET_t = \alpha + \beta \Delta CCI_t + \varepsilon_t \qquad (1)$$

where SET_t is the average market return (SET index %age change) on the change in CCI (ΔCCI_t) during the event period t. The average market return (ΔSET_t) is calculated by $\Delta SET_t = (SET_t - SET_{t-1}) / SET_{t-1}$, where t is the CCI announcement day and a day after then average the returns between the two. Equation (1) examines whether the changes in CCI have statistically significant impact to the average SET market returns on the announcement day and a day after.

After testing for the relationship between the changes in consumer sentiment and the aggregate market returns, this research further explore the trading behavior by investor type behind the empirical result of such relationship. This studying is conducted through the model:

$$\Delta SET_t = \alpha + \beta_1 \Delta CCI_t + \beta_2 RET_t + \beta_3 FORE_t + \beta_4 INS_t + \beta_5 PROP_t + \varepsilon_t \qquad (2)$$

where RET_t is the retail trading imbalance during the event period t while $FORE_t$, INS_t, and $PROP_t$ is the trading imbalance of foreign trader, institutional trader and proprietary trader, respectively. The trading imbalance of each investor type i at period t is computed as (Buy volume$_{it}$ - Sell volume$_{it}$) / (Buy volume$_{it}$ + Sell volume$_{it}$). Equation (2) examines if the changes in CCI have statistically significant impact to the average SET market returns on the announcement day and a day after and which investor types make such the impact on the market returns as a result of their trading behaviors changed in reaction to the change in CCI.

In addition to the trading behavior, this study also investigates the relationship of good year and bad year behind the empirical result of the impact resulting from change in CCI. This studying is conducted through the model:

$$\Delta SET_t = \alpha + \beta_1 \Delta CCI_t + \beta_2 GB_t + \beta_3 RET_t + \beta_4 FORE_t + \beta_5 INS_t + \beta_6 PROP_t + \varepsilon_t \qquad (3)$$

where GB_t represents a dummy variable equal to one if the event occurs in the good years and zero otherwise. Equation (3) investigates if the changes in CCI have statistically significant impact to the average SET market returns on the announcement day and a day after with control variables including all investor types adding a dummy variable to examine the impact of good year and bad year in relation with market returns.

CHAPTER IV
RESULTS AND DISCUSSION

4.1 Empirical Results on Stock Returns Event Study

4.1.1 Changes in CCI Impact on Aggregate Market Return

According to the event study method for examining the average market returns (SET Index) reaction as a result of changes in CCI during November 1998 and December 2011, Table 2 shows the result that the positive changes in CCI affect the average market returns. The average market returns positively react to the positive CCI changes in pre-event, event and post-event period with statistically significantly different from zero at the 1%, 10% and 5% level, respectively. To illustrate, CCI increases can drive average market return of 0.52% (t-stat = 1.96) during the CCI announcement day and a day after. For pre-event period, the result per Table 2 reveals some investors expectation on the positive changes in CCI affect the positive market returns before the announcement date with statistically significant at 1% level (t-stat = 2.85). It also demonstrates that investors underreact to the positive CCI change in the event period since the average market returns larger increase in the post-event period, for instance, CCI increase can lead the cumulative market returns after event period of 2.13% (t-stat = 2.29) with statistically significantly different from zero at the 5% level.

TABLE 4.1: The Impact of CCI Changes on Pre-Event, Event, and Post-Event Cumulative Market Returns

	Cumulative Market Returns (SET)			
	Pre-Event	Event	Post-Event	N
△CCI	0.0113*	0.0012	0.0097	147
	(1.6858)	(0.6401)	(1.5541)	
△CCI-	-0.0018	-0.0019	0.0004	82
	(-0.2022)	(-0.6975)	(0.0522)	

TABLE 4.1: The Impact of CCI Changes on Pre-Event, Event, and Post-Event Cumulative Market Returns (Cont.)

| | Cumulative Market Returns (SET) | | | |
	Pre-Event	Event	Post-Event	N
△CCI+	0.0278***	0.0052*	0.0213**	65
	(2.8489)	(1.9585)	(2.2934)	

Table 4.1 reports average market returns (SET Index) reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011. The changes in CCI are computed by the formula, (Index_t - Index_{t-1}) / Index_{t-1}. △CCI is the change in CCI without separating positive or negative change. △CCI- is the negative change in CCI when consumer confidence decreases. △CCI+ is the positive change in CCI when consumer confidence increases. Event period is indicated for the reaction on the announcement day and a day after (i.e., day0 and day1). Pre-Event period is indicated for the reaction during 20 days before the announcement day (i.e., day-20 to day-1) and Post-Event period is indicated for the reaction during 20 days after the announcement day (i.e., day2 to day20). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. t-statistics are reported in the parentheses.

4.1.2 Market Returns Reaction in Good or Bad Years

Since the result of study reveals the impact on the aggregate market returns resulting from CCI changes, this research further explore if there is the different impact of CCI changes in good years (the years with positive cumulative market returns) and bad years (the years with negative cumulative market returns). Table 4.2 reports the positive changes in CCI do affect the market returns when that positive change occurred in the good years by showing the average market return 0. 64% (*t*-stat = 2.03) during the CCI announcement day and a day after in a good year if CCI increases. The result per Table 4.2 also illustrates the investors' expectation on the positive changes of CCI that affect the market returns during the pre-event period as well as the investors' underreaction in the subsequent period during good years in accordance with the result per Table 4.1. The results per Table 4.2 are also tested to ensure that the market reactions during good year are statistically significant difference from the market reactions during bad year. The test results emphasize that the impact of CCI change on average market returns in between good year and bad year are statistically different from zero at 5% level (F-value = 5.7).

TABLE 4.2: The Impact of CCI Changes on Cumulative Market Returns in Good Years and Bad Years

		Cumulative Market Returns (SET)			
		Pre-Event	Event	Post-Event	N
△CCI-	Bad year	-0.0458***	-0.0033	-0.0234	31
		(-3.3076)	(-0.8209)	(-1.6687)	
△CCI-	Good year	0.0249**	-0.0011	0.0149	51
		(2.4854)	(-0.2875)	(1.5165)	
△CCI+	Bad year	0.0236	0.0009	-0.0053	14
		(1.1595)	(0.1942)	(-0.287)	
△CCI+	Good year	0.0289**	0.0064*	0.0286***	51
		(2.5830)	(2.0339)	(2.7012)	

*Table 4.2 reports average market returns (SET Index) reaction resulting from changes in CCI during November 1998 and December 2011 which are divided into Good years and Bad years based on cumulative market return in each year (e.g., positive cumulative returns reflect Good years, negative cumulative returns reflect Bad years). The changes in CCI are computed by the formula, $(Index_t - Index_{t-1}) / Index_{t-1}$. △CCI- is the negative change in CCI when consumer confidence decreases. △CCI+ is the positive change in CCI when consumer confidence increases. Event period is indicated for the reaction on the announcement day and a day after (i.e., day0 and day1). Pre-Event period is indicated for the reaction during 20 days before the announcement day (i.e., day-20 to day-1) and Post-Event period is indicated for the reaction during 20 days after the announcement day (i.e., day2 to day20). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. t-statistics are reported in the parentheses.*

4.1.3 Size Effect on Abnormal Returns

To answer the question – do changes in consumer confidence index appear to impact small firms the same as the larger firms, this research further study the CCI impact at firm level. By examining the cumulative abnormal return of small firms and the larger firms during event period, the result per Table 4.3 shows that decrease in CCI appear to impact small firms negative returns deviated from the average market returns with statistically significant at 1% level whereas no significant response in the larger firms. This is consisted with the previous results by Baker and Wurgler (2006) as well as Lemmon and Portniaguina (2006) who state that the results provide support

for the noise trader hypothesis which states that stock returns for assets held by individuals (noise trader) should be affected more so by sentiment. Regardless of positive or negative change in CCI, Table 4 reports the CCI changes lead the negative abnormal returns of small firms of -0.82% (*t*-stat = -3.71). If going deep down to the negative abnormal returns, the results per Table 4 reveals that negative abnormal returns are statistically significant driven by the negative CCI change. For instance, the abnormal return of those firms is -1.17% (*t*-stat = -2.47) when CCI decrease. The results per Table 4.3 are also tested for the significant difference between small firms and larger firms.

TABLE 4.3: The Impact of CCI Changes on Cumulative Abnormal Returns by Firm Size Cumulative Abnormal Returns

| | Cumulative Abnormal Returns | | | |
	Small Firms	Medium Firms	Large Firms	N
$\triangle$CCI	-0.0082***	-0.0018	-0.0008	147
	(-2.7117)	(-1.0137)	(-0.8202)	
$\triangle$CCI-	-0.0117**	-0.0015	-0.0005	82
	(-2.4697)	(-0.5352)	(-0.357)	
$\triangle$CCI+	-0.0038	-0.0022	-0.0012	65
	(-1.1525)	(-1.1347)	(-0.9004)	

*Table 4.3 represents the cumulative abnormal returns by firm size reaction resulting from changes in CCI on the event periods which is the announcement day and a day after (i.e., day0 and day1) during November 1998 and December 2011. The abnormal returns on stock i in time period t are computed by the formula, $Stock_{i,t}$ - SET_t, where SET is the aggregate market return. The stock returns are divided into one of three portfolios based on the market capitalization of the firms. The large firms are placed in the portfolio deciles two, the medium firms are placed in the portfolio deciles one and the small firms are placed in portfolio deciles zero. The changes in CCI are computed by the formula, ($Index_t$ - $Index_{t-1}$) / $Index_{t-1}$. $\triangle$CCI is the change in CCI without separating positive or negative change. $\triangle$CCI- is the negative change in CCI when consumer confidence decreases. $\triangle$CCI+ is the positive change in CCI when consumer confidence increases. ** and *** indicate significance at 5% and 1% levels, respectively. t-statistics are reported in the parentheses.*

4.1.4 Industry Effect on Abnormal Returns

Apart from size effect, this study also seeks to indicate whether the change in CCI impact Thai stock returns differently between industries. By examining the

cumulative abnormal return of stocks in each industry during the event period, the result per Table 4.4 demonstrates the cumulative abnormal returns of stocks in property and construction industry and resources industry impact due to changes in CCI. Both are statistically significantly different from zero at 10% level. However, the result shows the statistically significant impact on the positive abnormal returns of stocks in Property and Construction industry only if CCI decreases. For instance, those stocks abnormal return are equal to 0.49% (t-stat = 1.79) when CCI drop. On the other hand, the abnormal returns of stocks in Resources industry have positively relationship with CCI changes only when CCI increases. To illustrate, the return on resources stock are equal to 0.56% (t-stat = 1.72) when CCI increase. The reaction on stocks in Property and Construction industry might be explained by the long term investment point of view. Since the investors see the opportunity to invest in properties at lower price when the economy is looked as downturn, thus they will invest more during that period and then expect to gain higher returns in the future when the economic is back to normal. The impact on stocks in Resources industry is also explainable. Most of stocks trading in Resource industry represent stocks in energy and mine sector which are considered as blue ship stocks. Hence, when consumers are optimistic about the future economic situation, they are more likely to invest in stock market in order to gain the higher returns, especially in blue ship stocks which are typically high and certain profitability in term of both dividend yield and capital gain.

TABLE 4.4: The Impact of CCI Changes on Abnormal Returns by Industry

	Cumulative Abnormal Returns				
	Agro & Food Industry	Consumer Products	Financials	Industrials	N
$\triangle$CCI	0.0014	0.0014	0.0003	0.0007	147
	(1.0794)	(0.6395)	(0.2492)	(0.4673)	
$\triangle$CCI-	0.0003	0.0019	-0.0003	0.0001	82
	(0.1903)	(0.5822)	(-0.1575)	(0.0449)	
$\triangle$CCI+	0.0028	0.0008	0.0010	0.0015	65
	(1.3418)	(0.2752)	(0.609)	(0.8212)	

TABLE 4.4: The Impact of CCI Changes on Abnormal Returns by Industry (Cont.)

	Cumulative Abnormal Returns				
	Property & Construction	Resources	Services	Technology	N
$\triangle$CCI	0.0035*	0.0019	0.0003	0.0017	147
	(1.7809)	(1.0561)	(0.2816)	(0.8431)	
$\triangle$CCI-	0.0049*	-0.0010	0.0008	0.0010	82
	(1.7920)	(-0.4804)	(0.4224)	(0.4386)	
$\triangle$CCI+	0.0017	0.0056*	-0.0002	0.0025	65
	(0.6101)	(1.7198)	(-0.1014)	(0.7328)	

*Table 4.4 represents the cumulative abnormal returns by industry reaction resulting from changes in Consumer Confidence Index (CCI) on the event period which is the announcement day and a day after (i.e., day0 and day1) during November 1998 and December 2011. The abnormal returns on stock i in time period t are computed by the formula, $Stock_{i,t}$ - SET_t, where SET is the aggregate market return. The stock returns are grouped into eight equally weighted industries indicated in the Stock Exchange of Thailand. The changes in CCI are computed by the formula, $(Index_t - Index_{t-1}) / Index_{t-1}$. $\triangle$CCI is the change in CCI without separating positive or negative change. $\triangle$CCI- is the negative change in CCI when consumer confidence decreases. $\triangle$CCI+ is the positive change in CCI when consumer confidence increases. * indicate significance at 10% levels. t-statistics are reported in the parentheses.*

4.2 Empirical Results on Trading Behavior Event Study

4.2.1 Changes in CCI Impact on Market Trading Behavior

This research includes the event study regarding trading behavior to examine amongst different investor types which investor types are more responsive to the changes in CCI and whether they react differently between positive and negative change in CCI. Table 4.5 shows the results with statistically significant at 1% level that either CCI increases or decreases, retail traders will buy stocks whereas foreign traders and institutional traders will sell stocks. By separating negative and positive changes in CCI, the institutional traders, nevertheless have no statistically significant reaction when CCI increase.

TABLE 4.5: The Impact of CCI Changes on Market Trading Behavior

	Trading Imbalance				
	Retail	Foreign	Institution	Proprietary	N
$\triangle$CCI	0.0145***	-0.0640***	-0.1460***	-0.0235	147
	(3.9144)	(-2.6214)	(-4.0244)	(-1.3027)	
$\triangle$CCI-	0.0162***	-0.0555*	-0.1897***	-0.0202	82
	(3.4308)	(-1.7175)	(-4.0897)	(-0.9228)	
$\triangle$CCI+	0.0124**	-0.0746*	-0.0910	-0.0276	65
	(2.0890)	(-1.9943)	(-1.5898)	(-0.9153)	

Table 4.5 reports market trading reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011. The market trading behavior is determined by trading imbalance of each investor type. The trading imbalance is calculated by the formula, (Buy volume - Sell volume) / (Buy volume + Sell volume). The changes in CCI are computed by the formula, ($Index_t$ - $Index_{t-1}$) / $Index_{t-1}$. $\triangle$CCI is the change in CCI without separating positive or negative change. $\triangle$CCI- is the negative change in CCI when consumer confidence decreases. $\triangle$CCI+ is the positive change in CCI when consumer confidence increases. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. t-statistics are reported in the parentheses.

4.2.2 Market Trading Behavior in Good Years and Bad Years

This study further explore if there is the different impact of CCI changes on trading behavior during good years and bad years. Table 4.6 reveals that the reactions are mostly occurred when CCI decreases in bad years with statistically significant at 5% and 10% levels. To illustrate, retail traders will buy stocks while foreign traders and institutional traders will sell stocks. By focusing on the CCI increases during good years that it is statistically significant impact on the market returns per my previous result, only foreign traders who react to the CCI changes in a position of seller with statistically significant at 10% level.

TABLE 4.6: The Impact of CCI Changes on Market Trading Behavior in Good Years and Bad Years

Panel A: Negative change in CCI ($\triangle$CCI-)					
	Trading Imbalance				
	Retail	Foreign	Institution	Proprietary	N
Bad Year	0.0317***	-0.1385**	-0.2072**	-0.0227	31
	(3.5250)	(-2.6415)	(-2.7094)	(-0.6185)	
Good Year	0.0067	-0.0051	-0.1791***	-0.0187	51
	(1.3802)	(-0.1280)	(-3.0419)	(-0.679)	

Panel B: Positive change in CCI ($\triangle$CCI+)					
	Trading Imbalance				
	Retail	Foreign	Institution	Proprietary	N
Bad Year	0.0275	-0.0796	-0.1953	-0.0607	14
	(1.5849)	(-0.9587)	(-1.6416)	(-1.1712)	
Good Year	0.0082	-0.0733*	-0.0623	-0.0185	51
	(1.4073)	(-1.7306)	(-0.9555)	(-0.5165)	

*Table 4.6 reports market trading reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011 which are divided into Good years and Bad years based on cumulative market return in each year (e.g., positive cumulative returns reflect Good years, negative cumulative returns reflect Bad years). The market trading behavior is determined by trading imbalance of each investor type. The trading imbalance is calculated by the formula, (Buy volume - Sell volume) / (Buy volume + Sell volume). The changes in CCI are computed by the formula, $(Index_t - Index_{t-1}) / Index_{t-1}$. $\triangle$CCI- is the negative change in CCI when consumer confidence decreases. $\triangle$CCI+ is the positive change in CCI when consumer confidence increases. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. t-statistics are reported in the parentheses.*

4.2.3 Size Effect on Investor Trading Behavior

By aiming to explore whether each investor type trade in the same manner among small firms, medium firms and large firms in reaction to consumer sentiment changes positively and negatively, the investor trading behavior is examined by stock trading imbalances that are divided into one of three portfolios – small, medium and large firm size based on the market capitalization of the firms. Table 8 reports the different manner of each investor type among small firms, medium firms and large firms with statistically significant at 1%, 5% and 10% level. For instance, foreign

traders will buy small and medium stocks; in the meantime institutional traders and proprietary traders will sell those small and medium stocks either when CCI decreases or increases. Pointing at the investors who trade in small firms as their returns are statistically significant related to CCI changes according to my previous results, Table 4.7 shows that either CCI change positively or negatively, foreign traders will buy whereas institutional traders and proprietary traders will sell those small stocks with statistically significant at 1% level.

TABLE 4.7: The Impact of CCI Changes on Investor Trading Behavior by Firm Size

Panel A: Negative change in CCI (△CCI-)			
	Trading Imbalance		
	Retail	Foreign	Institution	Proprietary
Small Firms	0.0013	0.1665***	-0.6888***	-0.1053***
	(0.1749)	(5.9043)	(-6.3908)	(-2.9431)
Medium Firms	0.0021	0.1153***	-0.4681***	-0.0777***
	(0.3745)	(5.0724)	(-8.1114)	(-4.0692)
Large Firms	0.0133	0.0406	-0.0669	-0.0412*
	(1.2521)	(1.5265)	(-1.4868)	(-1.8677)

Panel B: Positive change in CCI (△CCI+)			
	Trading Imbalance		
	Retail	Foreign	Institution	Proprietary
Small Firms	0.0019	0.1211***	-0.7124***	-0.1694***
	(0.2921)	(5.6418)	(-7.9672)	(-4.2306)
Medium Firms	0.0160**	0.0984***	-0.4627***	-0.1297***
	(2.3992)	(5.2594)	(-7.7541)	(-4.8463)
Large Firms	0.0264**	-0.0104	-0.0462	-0.0540**
	(2.2747)	(-0.4087)	(-0.7036)	(-2.3877)

Table 4.7 reports market trading reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011. The investor trading behavior is determined by trading imbalance of each investor type. The trading imbalance is calculated by the formula, (Buy volume - Sell volume) / (Buy volume + Sell volume).The stock trading imbalances are divided into one of three portfolios based on the market capitalization of the firms. The large firms are placed in the portfolio deciles two, the medium firms are placed in the portfolio deciles one and the small firms are placed in portfolio deciles zero. The changes in CCI are

computed by the formula, (Index_t - Index_{t-1}) / Index_{t-1}. △CCI- is the negative change in CCI when consumer confidence decreases. △CCI+ is the positive change in CCI when consumer confidence increases. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. t-statistics are reported in the parentheses.

4.2.4 Industry Effect on Investor Trading Behavior

This research additionally study whether each investor type trade in the same manner among firms in eight industries relatively to consumer sentiment changes either when CCI change positively or negatively. By examining the trading imbalances of each investor type who trade on the stocks in each industry during the event period, the result per Table 4.8 demonstrates the different trading behavior between each group of investor type and each industry with statistically significant at 1%, 5% and 10% level. For instance, retail and foreign traders trend to buy stocks in Agro & Food industry when CCI decrease, while proprietary traders trend to sell those stocks. On the other hand, if CCI increase, institutional traders trend to sell those stocks in Agro & Food industry whereas no statistically significant reaction by foreign traders. Another industry that are more likely to affect by changes in CCI is Property & Construction in which institutional and proprietary traders will always sell while retail traders will buy if CCI decrease and foreign traders will buy if CCI increase.

TABLE 4.8: The Impact of CCI Changes on Investor Trading Behavior by Industry

Panel A: Negative change in CCI (△CCI-)

	Trading Imbalance			
	Retail	Foreign	Institution	Proprietary
Agro & Food Industry	0.0252** (2.0621)	0.1182*** (3.4607)	-0.0873 (-1.3387)	-0.1586*** (-3.0327)
Consumer Products	0.0079 (0.641)	0.0734 (1.656)	-0.1136 (-0.974)	-0.1730** (-2.1408)
Financials	0.0117 (1.0142)	0.0224 (0.9036)	-0.1339** (-2.5682)	-0.0283 (-1.6366)
Industrials	0.0133 (1.4431)	0.0568 (1.6521)	-0.1498** (-2.5844)	0.0151 (0.4153)

TABLE 4.8: The Impact of CCI Changes on Investor Trading Behavior by Industry (Cont.)

	Trading Imbalance			
	Retail	Foreign	Institution	Proprietary
Property & Construction	0.0242** (2.5057)	0.0387 (1.4952)	-0.1712*** (-3.1839)	-0.0497** (-2.3532)
Resources	0.0020 (0.1029)	0.0556 (1.6444)	0.0433 (0.7842)	-0.0423 (-1.2291)
Services	0.0214* (1.8474)	0.0194 (0.7207)	-0.0882 (-1.511)	-0.0240 (-0.6847)
Technology	-0.0128 (-1.2193)	0.0637** (2.5952)	-0.0539 (-0.804)	-0.0619** (-2.3811)

Panel B: Positive change in CCI ($\triangle CCI+$)

	Trading Imbalance			
	Retail	Foreign	Institution	Proprietary
Agro & Food Industry	0.0572*** (4.5333)	0.0290 (0.9722)	-0.2138*** (-2.9593)	-0.1482*** (-2.6933)
Consumer Products	0.0515*** (3.347)	-0.0300 (-0.7287)	-0.0114 (-0.0897)	-0.1225* (-1.8773)
Financials	0.0184 (1.3867)	0.0008 (0.028)	-0.0161 (-0.238)	-0.0671*** (-3.2431)
Industrials	0.0118 (1.2339)	0.0521* (1.8739)	-0.1726** (-2.155)	-0.0083 (-0.1744)
Property & Construction	0.0133 (1.4686)	0.0551** (2.1202)	-0.1543*** (-2.6763)	-0.0513** (-2.2897)
Resources	0.0392 (1.6038)	0.0423 (0.9915)	-0.0697 (-1.0586)	-0.0031 (-0.0665)
Services	0.0108 (0.9941)	0.0086 (0.3376)	-0.0558 (-0.8533)	-0.0851* (-1.7651)
Technology	0.0251** (2.5216)	0.0116 (0.4246)	-0.1539** (-2.3134)	-0.0636* (-1.8186)

*Table 4.8 reports market trading reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011. The investor trading behavior is determined by trading imbalance of each investor type. The trading imbalance is calculated by the formula, (Buy volume - Sell volume) / (Buy volume + Sell volume). The stock trading imbalances are grouped into eight equally weighted industries indicated in the Stock Exchange of Thailand. The changes in CCI are computed by the formula, (Index$_t$ - Index$_{t-1}$) / Index$_{t-1}$. $\triangle$CCI- is the negative change in CCI when consumer confidence decreases. $\triangle$CCI+ is the positive change in CCI when consumer confidence increases. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. t-statistics are reported in the parentheses.*

4.3 Empirical Results from Regression

4.3.1 Regression of the CCI Changes on Average Market Returns

To emphasize whether the changes in consumer sentiment exhibit statistical relationship with the aggregate market return during the event period, regression model is used in this study. The regression result is reported in Table 4.9 indicating that the coefficient for CCI changes ($\triangle$CCI) is statistically significant at 1% level (*t*-stat = 2.99) relative to average SET market returns during the event period. The result can be interpreted that a 10% change in CCI can drive the average market return to change by 1.508% in a positively relationship with CCI change. The overall regression model is statistically significant at 1% level (F-value = 8.94) with adjusted R-square 5.61%.

TABLE 4.9: Regression of the CCI Changes on Average Market Returns Market Reaction (SET) at Event Period

$$\Delta SET_t = \alpha + \beta \Delta CCI_t + \varepsilon_t$$

	Coefficients	*t*-stat
Intercept	0.0009	0.50
$\triangle$CCI	0.1508***	2.99
Observation (N)	146	
F-Value	8.94***	
Adjust R-Square	0.0516	

Table 4.9 represents regression of average market returns (SET Index) reaction resulting from changes in Consumer Confidence Index (CCI) during November 1998 and December 2011. The changes in CCI ($\triangle CCI_t$) are computed by the formula, $(CCI_t - CCI_{t-1}) / CCI_{t-1}$. The average market return ($\triangle SET_t$) is calculated by $\triangle SET_t = (SET_t - SET_{t-1}) / SET_{t-1}$, then cumulatived during the event period t, where t is the CCI announcement day and a day after. *** indicate significance at 1% level.

4.3.2 Regression of the CCI Changes with Trading Control Variables

By incorporating with control variables of trading imbalance per each investor type, this regression model will be able to further explore the market reaction on CCI changes is resulting from which investor type trading behavior. Table 4.10 reveals that the market reaction on CCI change mainly comes from proprietary trading with statistically significant at 10% level (*t*-stat = 1.79). The result illustrates that under trading control variables, a 10% change in CCI can drive the average market return to change by 1.475% in a positively relationship with CCI change at 1% significant level (*t*-stat = 2.98). The overall regression model is statistically significant at 1% level (F-value = 4.97) with adjusted R-square 11.96%.

TABLE 4.10: Regression for the Impact of CCI Changes on Average Market Returns and Trading Behavior

$$\triangle SET_t = \alpha + \beta_1 \triangle CCI_t + \beta_2 RET_t + \beta_3 FORE_t + \beta_4 INS_t + \beta_5 PROP_t + \varepsilon_t$$

	Market Reaction (SET) at Event Period	
	Coefficients	*t*-stat
Intercept	0.0039*	1.91
$\triangle$CCI	0.1475***	2.98
RET	-0.0844	-1.08
FORE	0.0096	0.79
INS	0.0050	1.01
PROP	0.0155*	1.79
Observation (N)	146	
F-Value	4.97***	
Adjust R-Square	0.1196	

Table 4.10 represents regression of average market returns (SET Index) reaction resulting from changes in Consumer Confidence Index (CCI) incorporated with control variables of trading imbalance of each investor type during November 1998 and December 2011. The changes in CCI ($\triangle CCI_t$) are computed by the formula, $(CCI_t$ - $CCI_{t-1}) / CCI_{t-1}$. The average market return ($\triangle SET_t$) is calculated by $\triangle SET_t = (SET_t$ - $SET_{t-1}) / SET_{t-1}$, then cumulatived during the event period t, where t is the CCI announcement day and a day after. RET_t is the retail trading imbalance during the event period t while $FORE_t$, INS_t, and $PROP_t$ is the trading imbalance of foreign trader, institutional trader and proprietary trader, respectively. The trading imbalance of each investor type i at period t is computed as (Buy volume$_{it}$ - Sell volume$_{it}$) / (Buy volume$_{it}$ + Sell volume$_{it}$). and *** indicate significance at 10% and 1% level, respectively.*

4.3.3 Regression of the CCI Changes adding Good/Bad Year Variables

In addition to the trading control variables, this study also investigates the relationship of good year and bad year behind the empirical result of the impact resulting from change in CCI. Table 4.11 reports that by adding a dummy variable that indicates the event period occurred in good year or bad year, the market is still react to the changes in CCI with statistically significant at 1% level (*t*-stat = 2.95) and such reaction is mainly from proprietary trading at 10% significant level (*t*-stat = 1.79). The result shows under trading control variables incorporated with good or bad year dummy variable, a 10 % change in CCI can drive the average market return to change by 1.484 % in a positively relationship with CCI change. The overall regression model is statistically significant at 1% level (F-value = 4.11) with adjusted R-square 11.34%.

TABLE 4.11: Regression for the CCI Changes impact on Market Returns and Trading in Good Years and Bad Years

$$\Delta SET_t = a + \beta_1 \Delta CCI_t + \beta_2 GB_t + \beta_3 RET_t + \beta_4 FORE_t + \beta_5 INS_t + \beta_6 PROP_t + \varepsilon_t$$

Market Reaction (SET) at Event Period		
	Coefficients	*t*-stat
Intercept	0.0043	1.17
$\triangle$CCI	0.1484***	2.95
GB	-0.0005	-0.12
RET	-0.0863	-1.08
FORE	0.0095	0.77
INS	0.0050	1.01

TABLE 4.11: Regression for the CCI Changes impact on Market Returns and Trading in Good Years and Bad Years (Cont.)

Market Reaction (SET) at Event Period		
	Coefficients	*t*-stat
PROP	0.0155*	1.79
Observation (N)	146	
F-Value	4.11***	
Adjust R-Square	0.1134	

Table 4.11 reports regression of average market returns (SET Index) reaction resulting from changes in Consumer Confidence Index (CCI) incorporated with control variables of trading imbalance of each investor type and adding a dummy variable to represent good or bad year during November 1998 and December 2011 which. The changes in CCI ($\triangle CCI_t$) are computed by the formula, (CCI_t - CCI_{t-1}) / CCI_{t-1}. The average market return ($\triangle SET_t$) is calculated by $\triangle SET_t$ = (SET_t - SET_{t-1}) / SET_{t-1}, then cumulatived during the event period t, where t is the CCI announcement day and a day after. GB_t represents a dummy variable equal to one if the event occurs in the good years and zero otherwise. RET_t is the retail trading imbalance during the event period t while $FORE_t$, INS_t, and $PROP_t$ is the trading imbalance of foreign trader, institutional trader and proprietary trader, respectively. The trading imbalance of each investor type i at period t is computed as (Buy volumeit - Sell volume$_{it}$) / (Buy volume$_{it}$ + Sell volume$_{it}$). and *** indicate significance at 10% and 1% level, respectively.*

CHAPTER V
CONCLUSION

This research explore the relationship between changing in consumer confidence and Thai stock market including both market level and firm level by studying on average market return, abnormal returns and incorporate with the reaction on trading behavior by investor type using the event study method and regression model. This study also examines the different reaction when the consumer confidence increases and decreases comparing to the previous month.

Based on the event study at market level, the result shows that only the positive changes in Consumer Confidence Index (CCI) affect the average market positive returns during the event period. It also reveals investors expectation on the positive changes in CCI before the announcement date as well as demonstrates that investors underreact to the positive CCI change in the event period. The positive changes in CCI again affect the market returns when that positive change occurred in the good years. In the meantime that CCI increases; the investor types that react to these events are retail traders as the buyers and foreign traders as the sellers. When focusing on CCI increases in good years, however, only foreign traders have statistically significant reaction.

The results of firm level study reveal only small firms that the decrease in CCI appear to impact with negative returns deviated from the average market returns whereas no significant response in the larger firms. It also indicates that those small stocks are traded by foreign traders who buy and institutional traders along with proprietary traders who sell. In addition, the results from industry effect report two industries - Property & Construction and Resource industry in which the stocks abnormal return are affected from change in CCI.

The regression results re-emphasize that the relationship between changing in consumer confidence and Thai stock market exist. The market returns are positively

relation to changes in CCI with statistically significant at 1% level and this result is consistent with the evidence from other previous studies in some countries.

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