Market Reactions towards Changes in Analysts' Ratings and Target Prices, Evidence from

Thailand

Miss Talatarn Kromadit

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

An Independent Study Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science in Finance

Department of Banking and Finance

FACULTY OF COMMERCE AND ACCOUNTANCY

Chulalongkorn University

Academic Year 2021

-

น.ส.ธราธาร กรมดิษฐ์

สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน
คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2564

Independent Study Title   Market Reactions towards Changes in Analysts' Ratings and

Target Prices, Evidence from Thailand

By   Miss Talatarn Kromadit

Field of Study   Finance

Thesis Advisor   Assistant Professor ANIRUT PISEDTASALASAI, Ph.D.

Accepted by the FACULTY OF COMMERCE AND ACCOUNTANCY,

Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Science

INDEPENDENT STUDY COMMITTEE

-- Chairman

(Associate Professor SIRA SUCHINTABANDID, Ph.D.)

-- Advisor

(Assistant Professor ANIRUT PISEDTASALASAI, Ph.D.)

-- Examiner

(Associate Professor VIMUT VANITCHAREARNTHUM,

Ph.D.)

ธราธาร กรมดิษฐ์ : . (Market Reactions towards Changes in Analysts' Ratings and Target Prices, Evidence from Thailand) อ.ที่ปรึกษาหลัก : ผศ. ดร.อนิรุต พิเสฏฐศลาศัย

-

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

สาขาวิชา	การเงิน	ลายมือชื่อนิสิต ....
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

6484046726 : MAJOR FINANCE

KEYWORD:

Talatarn Kromadit : Market Reactions towards Changes in Analysts' Ratings and Target Prices, Evidence from Thailand . Advisor: Asst. Prof. ANIRUT PISEDTASALASAI, Ph.D.

This paper aims to perform a comprehensive analysis of the effects of the stock ratings and target prices announcement published by analysts from both domestic and foreign brokerage firms in the Thai market. There are two quantitative indicators that will be focused on in this study, target prices and stocks rating, by observing the change of these two factors along with the change of market price, I will be able to study market reaction by using the Fama-French 3-factor modal (Fama and French, 1992) to detect AR and CAR within each focused window period. The observation period starts from January 2, 2019 to December 30, 2021.

This research is believed to be one of not many of Thai research that study an up-to-date and in-depth market movement according to the change of analyst' views towards stocks. In addition to the impact of rating and target price changes on the stock price individually, this research also analyses the combined effects of the 2 focused key variables. The results a significant correlation between announcements and market price movement as there is a significantly positive AAR and ACAR when ratings and target prices are upgraded and significantly negative AAR and ACAR when they are downgraded.

| Field of Study: | Finance | Student's Signature .... |
| Academic Year: | 2021 | Advisor's Signature .... |

ACKNOWLEDGEMENTS

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

TABLE OF CONTENTS

Page

Chapter 1

Introduction

1.1. Background of the Study

It has been under the discussion for a very long time whether the market is really

efficient. According to the Efficient Capital Market Hypothesis (EMH), everyone is assumed to

have equal access to information that is not costly, thus all available information is reflected in

the price of the stock fully and instantly. However, if EMH is true, why do investors who have

identical portfolios earn unidentical returns. In this research paper, I aim to conduct a strong form[1]

of hypothesis testing to examine whether the Thai market is efficient by observing and analyzing

the reaction of the Thai stock market to changes in analysts' target price and rating.

The main inspiration and motivation of studying this research topic come from my own

skepticism and urge to find the answer to whether the market is really efficient as well as to

understand more about the investors' investment behavior. According to the existing evidence,

there are many theories and studies that try to prove the EMH wrong, for example, the new school

of thought, Behavioral Finance, which suggests that investors are not always rational as they do

not always process information correctly and often make inconsistent decisions. The mentioned

school of thought is also corresponding with the recent research in the US such as (Womack

1996), (Brav and Lehavy 2003), and (Hong and Kubik 2003) that not only find the abnormal

return (AR) in their studies of market reaction studies but also find that the degree of such

---

[1] Strong form is one of the forms of EMH to test if the current market price has already reflected a
current set of information. The strong form simply says that both public and private information will
not yield abnormal returns.

reactions are varied depending on others factors such as the magnitude of change in recommendation and reputation of analysts. Therefore, it is very to find whether the Thai market shares the same results.

In this paper, I will conduct the analysis to study the market reactions to changes in stocks' ratings and target prices revised by securities analysts from well-known brokerage houses in Thailand. There are two quantitative indicators that will be focused on in this study, target prices and stocks rating, by observing the change of these two factors along with the change of market price, I will be able to study market reaction by using the Fama-French 3-factor modal (Fama and French 1993) to detect AR within each focused window period. By using the same method, I will conduct 3 further studies to observe the sensitiveness of the market towards 1) the different degrees of the rating change, 2) analysts and brokerage firms' reputation, and 3) underwriter/ non-underwriter title by grouping samples using 1) change of ratings and target prices, 2) analysts' raking, and 3) underwriter/ non-underwriter status criteria, respectively. The observation period starts from January 2, 2019, and December 30, 2021.

1.2. Objective of the Study

The main objective of this study is to try to find the answer to these questions as follows;

1. Whether there is a correlation between a market price movement and the change of analysts' recommendations. In this study, I expect the market to react positively to the upgraded ratings and target prices and react negatively to the downgraded ones (**Hypothesis 1**) as according to (Womack 1996) and (Asquith, Mikhail et al. 2005), their study shows that the US market is

significantly affected by analyst recommendation, and there is a positive correlation between market reaction and tone of the reports and magnitude of change in target prices.

2. Whether the market reacts differently to the different magnitude of change in analysts' ratings. In this observation, I expect that 1) in upgraded rating, the market will react more positively to 2-notch change than single-notch change, while react otherwise for downgraded rating (**Hypothesis 2.1**), 2. within the upgraded rating groups (SELL > HOLD, HOLD > BUY), there is a significantly positive difference in AAR and ACAR in 1-noth change to BUY, while in the downgraded rating groups (BUY to HOLD, HOLD to SELL), there is a significantly negative difference in AAR and ACAR in 1-noth change to SELL rating (**Hypothesis 2.2**), and 3) a significantly positive difference in AAR and ACAR in maintained BUY rating announcement compared to maintained at HOLD and BUY and expect a significantly positive difference in AAR and ACAR in maintained at HOLD compared to maintained at SELL announcement (**Hypothesis 2.3**). As according to prior studies, which examine a 5-tiered rating and find that the 2-notch change causes a significantly stronger reaction compared with the 1-notch change for both upgraded and downgraded ratings

3. Whether the greater magnitude of change of the new target price effects the degree of aggressiveness the market will react. I expect market to react more positively to higher than75% upgraded of target price than to less than 25% upgraded, vice versa. (**Hypothesis 3**) As such reaction is explained in (Ishigami and Takeda 2018) that large increase in target price only

happens when analyst is considered to have a very optimistic view about business's outlook and earnings compared with when the increase is small, vice versa.

4. Whether the market reacts differently to the different direction of target price change given the same direction of change of ratings. I expect, 1) market reacts more positively to upgraded rating with upgraded target price than the downgraded target price (**Hypothesis 4.1**) but reacts more negatively to downgraded rating with downgraded target price than the upgraded target price (**Hypothesis 4.2**), 2) there is no significant different of the means among the different direction of target price change within the same maintained ratings group (**Hypothesis 4.3**). According to (Asquith, Mikhail et al. 2005) and (Ishigami and Takeda 2018), they find correlation between the target price and the content of the report, thus, even for the same rating, market reacts differently according to the directions of the changes of target price

This research will be a great accomplishment and success to me and a great contribution to literature as according to prior studies, even though many researchers have studied the correlation between the characteristics of an equity market, investors, and analysts, most of the studies are only limited to developed countries such as the US market while there are only a few of such studies in developing countries. The Thai market is very interesting to be observed as its structure is very different from the US market because according to data from the Stock Exchange Thailand (SET) and SIFMA, unlike the US stock market that is dominated by institutional investors, the Thai stock market is driven by household investors. Moreover, the findings of this study will give more in-depth knowledge to the area of study about the recent of the Thai

market's perception toward analysts and brokerage firms' reputation and ranking, and underwriter and non-underwriter title, which have not yet been studied enough in the South East Asia region. Furthermore, in the aspect of the contribution to the non-academic area, I expect this research to deliver more insight understanding about the investment behavior of the investors to all stakeholders in the finance industry, especially to equity analysts.

Chapter 2

Literature Review

2.1 US Studies

Even though the first stock exchange was officially formed in London in 1773, the New York Stock Exchange which was founded 19 years later was the first market where real stocks trading took place. However, it took more than a century after the settlement date under the buttonwood tree for the US investors to be introduced to the stock rating and investment recommendations.

The fact that the role of equity research as the market information provider has never changed since the period of the Great Depression until today confirms the importance of analysts' works in the stock market mechanism. (Lloyd-Davies and Canes 1978) perform analyses on 597 buy recommendations and 188 sell recommendations of stocks on NYSE from 1970 to 1971 to study market efficiency through the effects of stock analysts' recommendations. They find that at the day of publication, on average, the abnormal return of the stocks that get "BUY recommendation" is +0.923%, while the abnormal return of the stocks that get "SELL recommendation" is -2.374%. Such movements of abnormal return show the significant impact of analysts' recommendations on changes in stock price.

Moreover (Lys and Sohn 1990), observe that from the available earning forecast of 58 listed companies over the sample period of 1980 to 1986 (23,938 individual analyst earnings forecast revision by 100 brokerage firms) provided by Zacks Investment Research (ZIR), the results of the study also show the significant role of analyst earnings forecast as there is evidence

suggesting that the content in analyst earnings forecasts are informative with respect to stock prices even when the publication date occurs after companies' financial announcements.

Later on, the study of the equity analysts' analysis is no longer limited to the impact from earnings forecast, as in the 1990s, researchers conduct more studies about the correlation between stock prices and analyst ratings. (Womack 1996) performs an analysis of the market reaction to new buy and sell recommendations of securities analysts from well-known U.S. brokerage houses. His samples consist of 1,573 recommendation changes during the period of the year 1989-1991 (the recommendations are classified into four types which are added-to-buy, removed-from-buy, added-to-sell, and removed-to-sell) collected from papers from First Call (real-time database of daily commentary of portfolio strategies, economists, and securities analysts gathered by First Call Corporation of Boston). The study finds that the mean unadjusted 3-day return from added-to-buy recommendations is +3.3% and the return from added-to-sell recommendations is -4.3%. Moreover, it also finds the significant price drift in the post-recommendation period, that is on average, stocks that are associated with buy recommendation have the size-adjusted return of +2.4% for the first postevent month while stocks that are in sell recommendation groups have the drift of -9.1% for over 6 months postevent period. The findings of the study show that stock prices are constructive and are influenced by analysts' forecasts and recommendations.

(Brav and Lehavy 2003) study the target price, stock recommendation, and earnings forecast during the year 1997-1999. They focus on around 165,000 ratings (Strong Buy/ Buy/

Hold/ Sell) from 190 brokers provided by First Call. The analysis shows a significant abnormal

return according to the revision of analysts' target price and there is a sign indicating abnormal

return is likely to increase to favor such changes. That is, on average, the abnormal return of

returns is ranging from -3.96% to 3.21% for the most negative target price revision to the most

positive. Furthermore, the analysis shows an interesting finding about the postevent CAR as well,

that is from 1-m postevent to 6-m postevent, on average, CAR for TP upgraded stocks is ranging

from +1.03% to 3.08%, while for TP downgraded stocks, CAR is ranging from -0.80% to -0.36%.

Moreover, they also find that, compared to analysts' recommendations, target price revision

carries much more information about the future abnormal returns.

(Asquith, Mikhail et al. 2005) examine 1,126 reports published by 56 sell-side analysts

during the 1997-1999 period. They study the content of the reports as well as the target price

accuracy and how the market reacts to changes in stocks ratings. Key findings of their work are 1)

there is a positive correlation between market reaction and tone of the reports and magnitude of

change in target price in downgrades and maintained rating groups, however, no sign for such

correlation in the upgrades rating group, and 2). The quality of the content of analysts' reports is

one of the key factors determining the cumulative abnormal return of the stock.

According to prior studies (Das, Levine et al. 1998), even though there are many

researchers who study the characteristics of an equity market, investors, and analysts, the

correlation between analyst status (ranking) and the contribution of their works is still ambiguous

and not well understood. Later on, (Fang and Yasuda 2011) analysis confirm the positive relation

between two factors by analyzing 392,711 recommendations, stocks return collected from CRSP

and the Institutional Brokers Estimate System (I/B/E/S), and All-American (AA) title rewarded

by Institutional Investor magazine during the time period of 1993 to 2009. They find that market

reacts more aggressively with the recommendations from top-rank analysts and the performance

of stock recommendations is tied with analyst status as the monthly returns from AAs' BUY

recommendations are +0.6% higher than those from non-AAs for those investors who have

advance access to brokerage firm information. The reason behind such positive correlation is

explained by (Hong and Kubik 2003) who study securities firm employment and earnings

forecast of 12,000 analysts from 600 firms during the 1983 to 2000 period. They find that it is

52% more likely that analysts who are extremely publishing more accurate forecasts will move up

to higher rank career status, while those who are less accurate are about 62% more likely to go in

the opposite direction which goes the same way as (Stickel 1992), (Hall and Tacon 2010) and

(Mikhail, Walther et al. 1997)'s studies of reputation among analysts.

The issue of conflict of interest in the finance industry has been mentioned for decades

by the financial press as people might be skeptical whether or not the opinions in analysts'

recommendations are dependent when the securities firms have some sort of business deals with

listed companies they write about, especially in initial public offerings (IPOs). (Michaely and

Womack 2015), (Bradley, Jordan et al. 2008) and (Lin and McNichols 1998) (Mikhail, Walther et

al. 1997) point out that 1) compared to non-underwriters' works, underwriter analysts might issue

too optimistic recommendations, and 2) analysts might be forced to give too positive views to

poor performance firms for IPOs. After analyzing a total of 391 IPOs issued during the year 1990

to 1991, the results show that 1) buy recommendations are found issued 50% more by the lead

underwriter analysts 1 month after the quiet period, 2) on average, prices of the stocked

recommended buy by the lead underwriters fall while recommendations from non-underwriters

turn out otherwise, and 3) market response more to non-underwriters' buy recommendations as

AR at the event date from underwriters' recommendation is only +2.7% while AR from

recommendation published by another group is +4.4%. Furthermore, the findings go the same

direction as (Asquith, Mikhail et al. 2005)'s analysis which confirm that the concern about

conflict of interest among underwriter analysts' recommendation is real as the market reacts

severely when the underwriter securities company downgrades the stocks it once initiated with

buy recommendation (Lin and McNichols 1998).

2.2   Non-US Studies

(Ishigami and Takeda 2018) are two of the researchers who analyze the reaction of

Japan's securities market in in-depth aspects. Their work focuses on finding out the correlation

between the change in two quantitative variables, ratings and target prices, and market reaction.

Unlike prior studies, Ishigami and Takeda do not only observe the reaction towards changing of

any analysts' ratings and target prices, but they also add more interesting variables to their works

such as date of publication, the reputation of brokerage firms, analysts ranking in the industry,

and underwriter/ non-underwriter factors.

After the analysis of 32,969 ratings of 794 non-financial firms which are accounted for 42% of the whole Tokyo Stock Exchange (researchers avoid using data from firms in the financial sector due to the different methods they use to conduct their financial statement compared to other sectors), the key findings are that 1) change in the rating of 1 notch get a weaker market reaction than 2-notch, 2) market has a more positive reaction to a maintained of Buy than the Maintained or Sell, but no different for the maintained of Hold, 3) there is a positive reaction to a new buy rating, but the negative reaction to both new sell and hold ratings, 4) the larger of the magnitude of change, the larger of the market reaction, 5) the market reacts significantly more aggressive to ratings announced by higher rank securities firms, and 6) there is no significant difference in the market reaction to change in ratings from the underwriter and non-underwriter analysts.
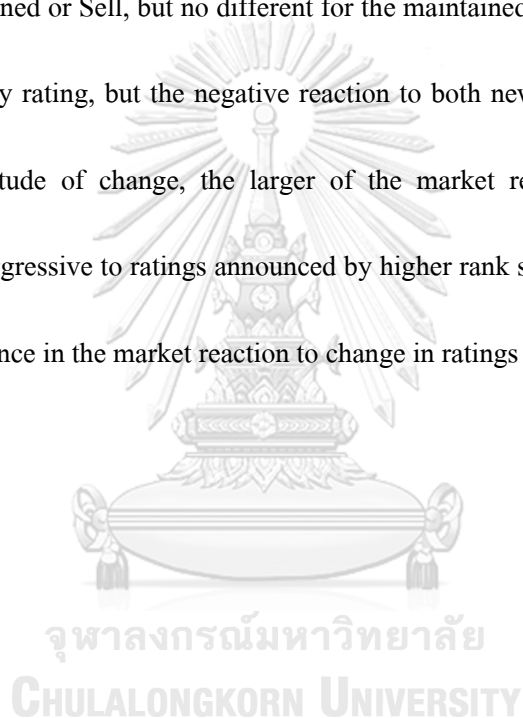
Chapter 3

Data

3.1 Data Observation and Criteria

There are two quantitative indicators that will be focused on in this study, target prices and stocks rating, by observing the change of these two factors along with the change of market price of the stocks, I will be able to conduct the analysis that shows the market reaction to changes in stocks' ratings and target prices revised by securities analyst from well-known brokerage houses in Thailand.

The primary data analyzed in this paper comes from Bloomberg Terminal, a software system provided by Bloomberg L.P., a financial company headquartered in New York City that provides in-depth financial data and financial software. With Bloomberg Professional Services, investors are able to analyze and monitor real-time financial market data from all industries.

Analyst reports from houses that will be chosen to use in this study have to meet the following criteria: Analyst reports can be obtained through a database provided by Bloomberg, which collected costly insight securities information mostly for professional investors, analyst reports must be released in the period between January 2, 2019, and December 30, 2021, in each window period, there must be no more than 1 event date in order to purely examine the real effect of analysts' recommendations for each event, to examine the anormal return in pre-event and post-event as mentioned to be exist in Womack (1996) and Ishigami and Takeda (2017), each event must have 3-day both pre-event and post-event date that does not contain any other

analysts' announcements, called window period. Moreover, the window period of any event must

not overlap with one another, and the period without ratings reported must be less than 6 months.

3.2 Sample and Observation

Table 1 shows the 16 companies that satisfy the conditions:

Out of data from 25 brokerage firms available on Bloomberg Terminal, there are 16

companies that satisfy the criteria mentioned above as follow:

1. 10 Foreign securities companies: UOB Kay Hian Securities (KAY), Asia Plus

   Securities (APS), KT ZMICO Securities (ZMC), DBS Vickers Securities (DBS),

   Finansia Syrus Securities (FSY), CIMB Securities (CIM), Phillip Securities (PHS),

   KGI Securities (KGI), Trinity Securities (TNT), Tisco Securities (TSC).

2. 6 Domestic securities companies: Kasikorn Securities (KSK), Siam Commercial Bank

   Securities (SSB), Bualuang Securities (BUA), Thanachart Securities (TCS),

   Krungthai Securities (FES), and Krungsri Securities (AYS).

Table 1: Securities firms that satisfy the study criteria

| Securities companies sample	
Foreign Securities Companies	Domestic Securities Companies
UOB Kay Hian Securities (KAY)	Kasikorn Securities (KSK)
Asia Plus Securities (APS)	Siam Commercial Bank Securities (SSB)
KT ZMICO Securities (ZMC)	Bualuang Securities (BUA)
DBS Vickers Securities (DBS)	Thanachart Securities (TCS)
Finansia Syrus Securities (FSY)	Krungthai Securities (FES)
CIMB Securities (CIM)	Krungsri Securities (AYS)
Phillip Securities (PHS)	Phatra Securities (PTS)
KGI Securities (KGI)	
Trinity Securities (TNT)	
Tisco Securities (TSC)	
Macquarie Securities (MAC)	

3.3 Sample of Rating and Target Price

Table 2 shows the industry distribution of the data used in this study. From all collected

stock ratings and target prices data from all the listed companies in the Stock Exchange Thailand

(SET) that are available on Bloomberg from the beginning of 2019 to the end of 2021. We deleted

2 groups of data which are, 1. all ratings and target prices of firms in the financial sector due to

the different methods such firms use to conduct financial statements compared to those in non-

financial sectors. For Example, in financial statements of financial institutions, there are special

items such as Net Interest Margin (NIM), Nonperforming Loan (NPL) ratio, coverage ratio, Loan

Loss Provision (LLR) to loan, and credit cost, and 2. The stocks that do not meet the criteria

explained in "data criteria" section above (however, the main reason is that many of the stocks

have very low analyst coverage or if they do, the analysts seem to not actively update the paper

during the 3 years of study). Therefore, the final sample consists of 2,747 ratings and target prices

announcements from 161 companies, accounting for 27% of all the firms listed in the Stock

Exchange Thailand (SET) The majority of the sample are from Energy and Real estate sector

which accounted for 17% and 14% of total sample, respectively. Moreover, the sample also well

represents Thai stock market as the sample is accounted for 76% of stocks in SET100.

Figure 1 shows that ratings grouping diagram used in this study. Even though the

expression of recommendation of each brokerage house is various and subjective, for example,

"Outperform", "Buy", "Neutral", and "Hold", the Bloomberg Terminal provides a 5-tiered rating

("5 = Strong Buy", "4 = Buy", "3 = Hold", "2 = Sell", and "1 = Strong Sell"). However, for

regression simplicity, I choose to use a 3-tiered rating system instead. Therefore, in this paper, 1

indicates ratings "Buy" and "Strong Buy", 2 refers to rating "Hold", and 3 refers to ratings "Sell"

and "Strong Sell".

Figure 1: Ratings classification diagram
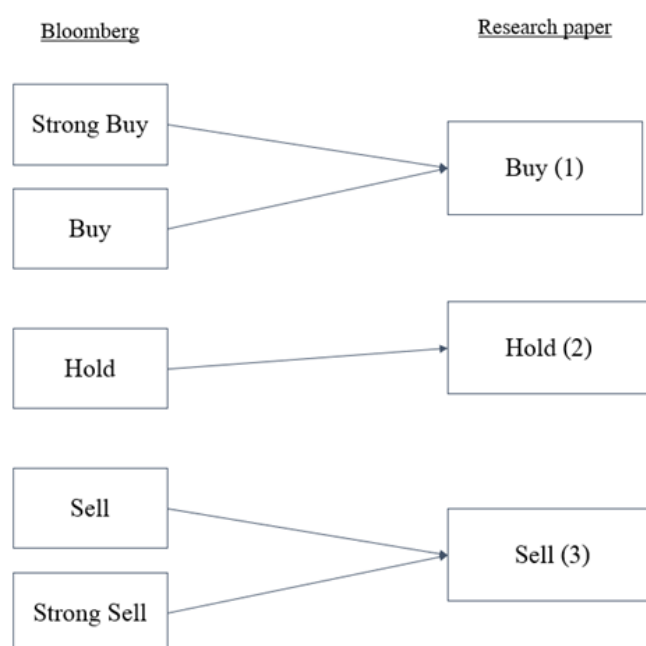
As shown in **Table 3,** for target price analysis, there are 3 main groups used in this study,

which are, 1. "Up", which refers to a positively upgraded target price from the previous

announcement, 2. "Stay", which refers to no upgraded or downgraded target price from the

previous announcement, and 3. "Down", which refers to a negatively downgraded target price

from the previous announcement. Form all the useable events, there are 437 events with upgraded

target price, 1,855 events with no change of target price, and 449 events with downgraded target

price. The data shows that the spread of the target price sample in each quantile group is very

close to each other.

Table 2: Industry Distribution

Industry	No. of sample firms (A)	No. of firms listed in SET (B)	A/B
Agribusiness (AGRI)			
Agriculture (AGRI)	2	13	15.38%
Food and Beverage	14	49	28.57%
Resources (RESOURC)			
Energy and Utilities (ENGERG)	26	64	40.63%
Mines (MINE)	0	1	0.00%
Real Estate and Construction (PROCORN)			
Construction Materials (CONMAT)	7	20	35.00%
Real Estate Development (PROP)	22	60	36.67%
Construction Services (CONS)	7	27	25.93%
Property Fund and Real Esstate Investment Trust	5	59	8.47%
Service (SERVICE)			
Commercial (COMM)	16	30	53.33%
Medical (HEALTH)	9	23	39.13%
Media and Publishing (MEDIA)	7	27	25.93%
Ad-hoc service (PROF)	1	5	20.00%
Tourism and Leisure (TOURISM)	5	14	35.71%
Transportation and Logistics (TRANS)	11	27	40.74%
Technology (TECH)			
Electronic Components (ETRON)	4	9	44.44%
Information and Communication Technology (ICT)	11	34	32.35%
Industrial Products (INDUS)			
Automotive (AUTO)	3	17	17.65%
Industrial Materials and Machinery (IMM)	0	14	0.00%
Paper and Printing Materials (PAPER)	1	1	100.00%
Petrochemicals and Chemicals (PETRO)	3	15	20.00%
Packaging (PKG)	3	20	15.00%
Steel and Metal Products (STEEL)	0	24	0.00%
Consumer Goods (CONSUMP)			
Fashion (FASHION)	1	19	5.26%
Household and Office Supplies (HOME)	0	11	0.00%
Personal Care and Medical Supplies (PERSON)	3	9	33.33%
Financial Business (FINCIAL)			
Bank (BANK)	0	11	0.00%
Funds and Securities (FIN)	0	38	0.00%
Insurance and Life Insurance (INSUR)	0	18	0.00%
Total	**161**	**597**	**26.97%**
SET 100	**76**	**100**	**76.00%**

Table 3: Target Price Sample and Quantile Grouping

Target price	Group	no.
Up	Total	437
	Q1	106
	Q2	111
	Q3	110
	Q4	110
Stay	Total	1,855
Down	Total	449
	Q1	112
	Q2	110
	Q3	111
	Q4	116

For the daily individual stock return, I calculate the return of each focused stock by using their dividend included return obtained from DataStream. For other data concerning the Fama-Fench model **(Table 5),** the sources of data are as follows; 1-month T-bill Yield (R_{ft}) and SET Total Return Index (R_{mt}) are obtained from DataStream, while SMB_t, and HML_t data used in this analysis are followed (Charoenwong, Nettayanun et al. 2021), and the data are obtained through SETSMART. From the daily data, the yearly return of each variable is 1.07%, 8.12%, 2.11%, and 3.22% respectively. The stat tells that even during the crisis, on average, the return from stocks is still higher than government T-bills.

Table5: Statistic able for Fama-French 3-factor variables.

	Mean	Min	Max	SD
Rm	0.0003	-0.1076	0.0796	0.0100
Smb	0.0001	-0.0398	0.0378	0.0063
Hml	0.0001	-0.0261	0.0379	0.0058
Rf	0.0000	0.0000	0.0001	0.0000

Chapter 4

Methodology

The main objective of this research is to study the market reactions towards changes in stocks ratings and target prices revised by securities analysts in Thailand by observing the correlation between changes in ratings, target prices, and market prices of each stock. Moreover, this paper also observes the magnitude of market reaction to difference degree of change of analyst's rating and target price. The observation period is set to be 3 years, starting from January 2, 2019 to December 30, 2021.

After data collecting, I examine the relationship among focused factors (rating, target price, and market price) of each individual stock using Fama- French 3-factor model (Fama and French, 1993) as follows.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \gamma_i SMB_t + \delta_i HML_t + \varepsilon_{it} \tag{1}$$

For equation (1), R_{it} indicates daily return (including dividend) of stock i, R_{ft} is the return of risk-free asset which in this study, we use 1-month T-bill Yield, and R_{mt} is market return, which is the daily return of the total SET Index, For size and value factor, we use SMB_t and HML_t, which refer to small cap return minus large cap return and high book-to-market stock return minus low book-to-market stock return, respectively. Lastly, ε_{it} is an error term. Follows (Womack 1996), and (Ishigami and Takeda 2018), this research use -3/+3-day and -1/+1-day

window period around the event date, and 24 months estimation window starting from January 4,

2017.

I use the equation (1) to find the expected coefficient of each variable ($\hat{\alpha}_i, \widehat{\beta}_\iota, \widehat{\gamma}_\iota$, and $\widehat{\delta}_\iota$)

in the event window by running the linear regression using data from estimation period. With

those expected coefficients, we get estimated abnormal returns (AR_{it}) for every event which will

be used later in this study.

For the window period, as different literature uses different window periods according to

their sample environment, for example, (Womack 1996) and other US studies use -3/+3 window

period, while Ishigami and Takeda (2017) use -1/+1 window period for the Japanese market.

Therefore, for the Thai market, this research follows the Us studies by using -3/+3 window period

as the main analysis approach as the method is used more widely. However, also show the results

from using -1/+1-day window to confirm the result whether they change given smaller window as

Thai market may or may not be efficient.

Secondly, calculate each stock excess return or abnormal return (AR) and cumulative

abnormal return using estimated coefficients, $\hat{\alpha}_i, \widehat{\beta}_\iota, \widehat{\gamma}_\iota$, and $\widehat{\delta}_\iota$ as follows.

$$AR_{it} = \left(R_{it} - R_{ft}\right) - \{\hat{\alpha}_i + \widehat{\beta}_\iota\left(R_{mt} - R_{ft}\right) + \widehat{\gamma}_\iota SMB_t + \widehat{\delta}_\iota HML_t\} \quad (2)$$

$$CAR_{it} = \sum_{t=T_1}^{T_2} AR_{it} \quad (3)$$

Thirdly, calculate the mean AAR (average abnormal return) and ACAR (average cumulative abnormal return) of subgroup p as follows.

$$AAR_p = \frac{1}{n_p} \sum_{t=1}^{n_i} AR_{it} \tag{4}$$

$$CAR_p = \frac{1}{n_p} \sum_{t=1}^{n_i} AR_{it} \tag{5}$$

$$n_p = \sum_{i=1}^{N} n_i \tag{6}$$

Where n_i is the number of release dates of ratings on firm i in the group p, and N is the number of firms i in group p. To test the null hypothesis, $H_0: AAR(ACAR) = 0$ means that the stock prices do not respond to the release of analysts' announcement.

$$\text{T value}_{AAR} = \frac{AAR_p - 0}{\widehat{\sigma_p}} \tag{7}$$

$$\text{T value}_{CAR} = \frac{ACAR_p - 0}{\widehat{\sigma_p} \, (L)^{1/2}} \tag{8}$$

Where L is the length of the event window and σ_{ip} is the standard deviation of AR_{it} in group p over the estimation window.

4.1 Correlation Between Market Reaction and Analysts' Announcement Study

To test whether there is a correlation between market prices and changes in ratings and target prices, I use the above methodology (equation 1- 8), if AAR and ACAR are not equal to 0, the market has response to the changes of target ratings and target price.

4.2 Market Reaction to Magnitude of Change of Ratings and Target Prices Study

4.2.1 Market Reaction to Rating announcement

To test whether the market reacts differently to the different magnitude of change in analysts' stock ratings. Firstly, I classify both the ratings samples into 3 sub-groups according to their direction of change. The grouping process is as follows.

4.2.1.1 Ratings groups

Firstly, I arrange the data by grouping each firm with its analysts' announcement. Then I filter the "useable" events by using the criteria that within -3/+3 window period, there must be no more than 1 analyst's announcement. Then, I conduct the linear regression to calculate the expected variables of each event using the R_{it}, R_{ft}, R_{mt}, SMB_{it}, and HML_{it} in the 24 months estimation period prior the first day of window (t=-3) so that I get AR_{it} and CAR_{it}.

Secondly, I group AR_{it} and CAR_{it} using 3-tiered rating system consisting of 1 for BUY (Buy and Strong Buy), 2 for HOLD, and 3 for SELL (Sell and Strong Sell), we can our observing data into 3-subgroups (Figure 2) as follow.

1) UP sub-group: Sell to HOLD (3>2), HOLD to BUY (2>3), and SELL to BUY (3>1)

2) STAY sub-group: maintained SELL (3), maintained HOLD (2), and maintained BUY (1)

3) DOWN sub-group: BUY to HOLD (1>2), HOLD to SELL (2>3), and BUY to SELL (1>3)

Thirdly, I calculate AAR_p and $ACAR_p$ in each sub-group and then compare the results between sub-groups to test Hypothesis 2.1 - Hypothesis 2.4 as follows.

Hypothesis 2.1: <u>The market will react more aggressive to 2-notch change than single-notch change</u>. To test this, I compare one group that contains stocks whose ratings are changed by 2-notch to another group that contains stocks whose ratings are changes by 1-notch. I expect significantly positive difference in AAR and ACAR in upward change, and significantly negative for the downward change.

Hypothesis 2.2: <u>For a 1-notch change in ratings, the market reacts more aggressively to a change to "BUY" (Hold to BUY) and "SELL" (HOLD to SELL) rating than to a change in the same direction to "HOLD" (SELL to Hold and BUY to HOLD) rating</u>. To test this, I compare one group that contains stocks that ratings change 1-notch to BUY or to SELL to another group that contains stocks that ratings change in the same direction to HOLD (SELL to Hold and BUY to HOLD). I expect significantly positive difference in AAR and ACAR in 1-notch change to BUY, and significantly negative for 1-notch change to SELL.

Hypothesis 2.3: <u>For maintained rating, the market reacts more positively to maintained BUY than maintained HOLD or maintained SELL. Moreover, the market also reacts more positive to maintained HOLD than to maintained SELL.</u> To test this, first, I compare one group that contains stocks that ratings are maintained at BUY to another group that contains stocks that ratings are maintained at HOLD and SELL. I also compare maintained at HOLD sub-group to maintained at BUY sub-group. I expect significantly positive difference in AAR and ACAR in maintained BUY rating announcement compared to maintained at HOLD and BUY and expect a

significantly positive difference in AAR and ACAR in maintained at HOLD compared to maintained at SELL announcement.

4.2.2 Market Reaction to Target Prices Announcement

To study the target prices, I focus on the change of them and denote them as "TP" using the following equation (9), then classify them into 3 sub-groups as follows:

$$TP = \frac{Target\ Price_t - Target\ Price_{t-1}}{Target\ Price_{t-1}} \tag{9}$$

1) UP sub-group: if the rate of change is equal to positive number.

2) STAY sub-group: if the rate of change is equal to 0.

3) DOWN sub-group: if the rate of change is equal to negative number.

Secondly, I classify Up sub-group and down sub-group in a smaller group by using the magnitude of target price change as criteria (Q1-Q4) (Figure 2). Q1 sub-group refers to a group that contains stocks in which target price are changed equal or less than 25%, Q2 sub-group refers to a group that contains stocks in which target price are changed more than 25% but equal or less than 50%, Q3 sub-group refers to a group that contains stocks in which target price are changed more than 50% but equal or less than 75%, and Q4 sub-group contains stocks that target price are changed more than 75%.

Lastly, I calculate AAR_p and $ACAR_p$ in each sub-group and then compare the results between sub-groups to test Hypothesis 3 as follows.

Hypothesis 3: <u>The greater magnitude of change of the new target price, the more aggressive market reacts</u>. To test this, I compare the group that has highest percentage change in target price (Q4) to the lowest percentage change group (Q1). I expect significantly positive difference in AAR and ACAR in UP sub-group (market reacts more positively to higher than 75% upgraded of target price than to less than 25% upgraded). Moreover, I expect significantly negative difference in AAR and ACAR in DOWN sub-group (market reacts more negatively to higher than 75% downgraded new target price than to less than 25% downgraded).

Figure 2: Target Rating and Target Price Grouping
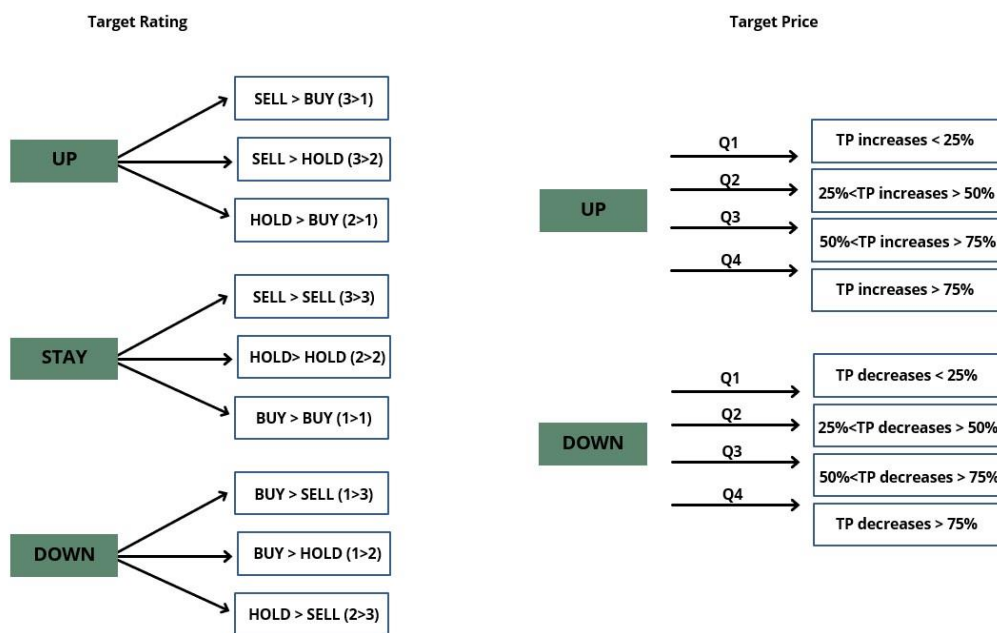
4.2.3   Market Reaction to Combination of BOTH Ratings and Target Prices

For this study, I combine RATING sub-groups and TARGET PRICE sub-groups together to study more in-depth reaction of the Thai stock market towards every type of analyst's announcement. Therefore, I classify the events into new 9 sub-groups as shown in Figure 3.

In this hypothesis testing, I adopt the same technique which is calculating AAR_p and $ACAR_p$ in each sub-group and then compare the results among others focused sub-groups to see if the magnitude of market reaction.

Figure 3: Target Rating and Target Price Grouping
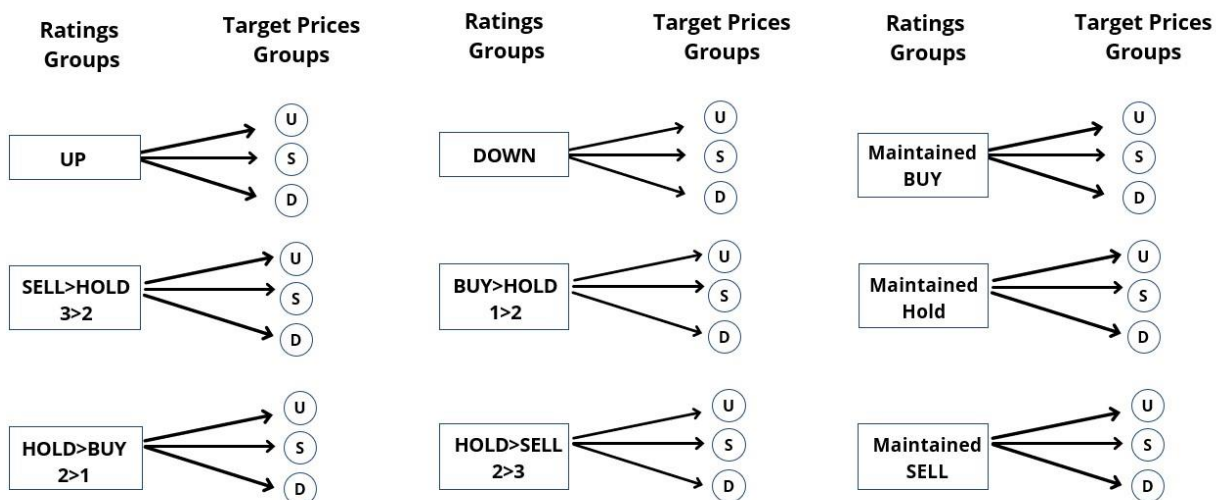
Hypothesis 4.1: <u>Market reacts more positively to upgraded rating with upgraded target price than the downgraded target price, but reacts more negatively to downgraded rating with downgraded target price than the upgraded target price</u>. For UP rating sub-group testing, I

compare AAR and ACAR of stocks in 3 groups, which are "upgraded rating with upgraded target price", "upgraded rating with maintained target price", and "upgraded rating with downgraded target price". For DOWN rating sub-group testing, I then compare AAR and ACAR of stocks in 3 groups, which are "downgraded rating with upgraded target price", "downgraded rating with maintained target price", and "downgraded rating with downgraded target price". I expect a significant positive difference of AAR and ACAR in upgraded rating with upgraded target price, while expect a significant negative difference in downgraded rating with downgraded target price.

Hypothesis 4.2: <u>For the same direction of change in rating, market react significantly different depending on the direction of change of target price</u>. To test this, I compare AAR and ACAR of different type of change in target price within the same direction of rating. For example, in Up rating sub-group (3>2 and 2>1), I compare AAR and ACAR among 3>2 with up TP, 3>2 with stay TP, and 3>2 with down TP, and repeat the same method with Down rating sub-group (1>2 and 2>3). I expect that in every rating group, market reacts differently (have significantly different means) according to the direction of change of new target price. Moreover, in Up rating sub-group, market reacts significantly more positive to stocks with upgraded target price compared to maintained and downgraded. Moreover, for Down rating sub-group, I expect market to react significantly more negative to stocks with upgraded target price compared to maintained and upgraded.

Hypothesis 4.3: <u>For maintained target price, there is no significant different in market reaction towards different direction of change in target price.</u> I compare AAR and ACAR of every direction of change of target price within the same maintained rating sub-groups (Stay1, Stay2, Stay 3). I expect no significant different of the mean among the different direction of target price change.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Chapter 5

Empirical Results

5.1 Market Reaction to Rating announcement

Objective: to test whether the market reacts differently to the different magnitude of change in analysts' stock ratings.

Table 6 presents the results of univariant analyses to test Hypotheses 2.1 - 2.4. as follow.

The differences between Group A (3>1) and Group B (2>1) are significantly positive for all AAR, -3/+3ACAR, and -1/+1ACAR, 0.0219, 0.0168, and 0.0285 respectively. While the differences of Group D (1>3) and Group F (2>3) are significantly negative for AAR and -3/+3ACAR, -0.0005 and -0.0064, respectively. The results imply that for both upward and downward rating change, market reacts significantly stronger to 2-notch change than to 1-notch change. The finding shows that in this category, Thai market follows both US and non-US's studies as the result is consistent with (Stickel 1992), which examine a 5-tiered rating and find that the 2-notch change causes a significantly stronger reaction compared with the 1-notch change for both upgraded and downgraded ratings. Therefore, the results are consistent with **Hypothesis2.1.**

Furthermore, the study also finds the significantly positive differences of Group C (2>1) and Group B (3>2) as AAR, -3/+3ACAR, -1/+1ACAR are -0.0051, -0.0060, -0.0025, respectively, and the significantly negative differences of Group F (2>3) and Group E (1>2) as AAR, -3/+3ACAR, -1/+1ACAR are -0.0002, -0.0018, -0.0129, respectively. The results imply that even though both groups represent the same direction of change, Thai market reacts stronger

to a change to BUY and SELL rating than a change to HOLD. The findings ally with Japan studies, which also find that although the analysts clearly indicate that equities are positively upgraded or downgraded when they announce a change from SELL/ BUY to HOLD and change from HOLD to BUY/ SELL ratings, but market is believed to have a stronger reaction to change to BUY/ SELL ratings and buy/ sell more of such stocks. Therefore, the results are consistent with **Hypothesis2.2.**

For the maintained ratings study, **Table 7** presents the results of univariant analyses to test Hypotheses 2.5 as follow.

The results show significantly positive AAR, -3/+3ACAR, and -1/+1ACAR in "Stay 1" sup-group (maintained buy), but not significant AAR and ACAR in "Stay 2" sup-group (maintained hold) and "Stay 3" sub-group (maintained sell). From the results, we can imply that Thai market reacts strongly positive when the analysts publish maintained BUY ratings. The Thai's findings also follow Irvine (2003), Ota and Konda (2010), and Ishigami and Takeda (2017) which find significantly positive AAR and ACAR in maintained BUY ratings (both 5-tier and 3-tier rating system). For the negative AAR and ACAR in maintained HOLD ratings, even though not significant but also ally other prior studies that explain that when a HOLD rating is maintained, the market reaction is thought to be vary based on the effects of change in target price. While (Irvine 2003) also finds a not significant results for maintained SELL ratings. Therefore, the results are consistent with **Hypothesis2.3.**

Table 6: Market Reaction to Rating Announcement (focusing on rating upgrade and downgrade)

Market Reaction to Rating announcement (Downgrade and Upgrade)

Hypothesis2.1: the differences of Group A (3>1) and Group B (2>1) are significantly positive for both AAR and ACAR, imply that for upward rating change, market reacts significantly more positive to 2-notche upgrade (SELL > BUY) than 1-nothce upgrade (HOLD > BUY). Hypothesis 2.2, the differences of Group D (1>3) and Group F (2>3) are significantly negative for both AAR and ACAR, which can be implied that for downward rating change, Thai market reacts significantly more negative to 2-notch downgrade (BUY > SELL) than to 1-notch (HOLD > SELL) downgrade. Hypothesis 2.3, the significantly positive differences of Group C (2>1) and Group B (3>2) implies that even though both groups represent an upgraded rating, Thai market reacts stronger to a positively change to BUY rating than a positively change to HOLD. Hypothesis 2.4, the significantly negative differences of Group F (2>3) and Group E (1>2). ***,**,* refer to Statistical significance at the 1%, 5%, and 10% level, respectively.

Rating	Group	No.	AAR	ACAR	ACAR
				-3,+3 window period	-1,+1 window period
Up	Total	148	0.0037	0.0121	0.0088
			8.9268 ***	10.9801 ***	11.3383 ***
3 > 1	A	17	0.0233	0.0290	0.0362
			49.8090 ***	23.4744 ***	41.9582 ***
3 > 2	B	31	-0.0003	0.0001	-0.0053
			-0.6784	0.0747	-6.8034 ***
2 > 1	C	100	0.0014	0.0122	0.0077
			3.2980 ***	11.0260 ***	9.8396 ***
Down	total	176	-0.0052	-0.0076	-0.0056
			-12.4671 ***	-6.8141 ***	-7.1335 ***
1 > 3	D	30	-0.0058	-0.0142	-0.0101
			-13.7389 ***	-12.6554 ***	-12.7799 ***
1 > 2	E	120	-0.0051	-0.0060	-0.0025
			-12.1187 ***	-5.3528 ***	-3.1722 ***
2 > 3	F	26	-0.0053	-0.0078	-0.0154
			-12.5477 ***	-6.9535 ***	-10.8034 ***
Rating	**Difference**	**No.**	**AAR**	**ACAR**	**ACAR**
				-3,+3 window period	-1,+1 window period
Hypothesis					
2.1	A-C		0.0219	0.0168	0.0285
			125.9109 ***	36.6183 ***	92.5141 ***
	D-F		-0.0005	-0.0064	0.0053
			-11.5048 ***	-53.5644 ***	66.6146 ***
2.2	C-B		0.0017	0.0121	0.0129
			49.8361 ***	137.4008 ***	218.9797 ***
	F-E		-0.0002	-0.0018	-0.0129
			-5.6834 ***	-20.0982 ***	-216.8285 ***

Table 7: Market Reaction to Rating Announcement (focusing on maintained rating)

Market Reaction to Rating announcement (Maintained)

The results show significantly positive AAR and ACAR (both -3/+3 and -1/+1 window period) in "Stay 1" sup-group (maintained buy), but not significant AAR and ACAR in "Stay 2" sup-group (maintained hold) and "Stay 3" sub-group (maintained sell) in -3/+3 window period. From the results, we can imply that Thai market reacts strongly positive when the analysts publish maintained BUY ratings. ***,**,* refer to Statistical significance at the 1%, 5%, and 10% level, respectively.

Rating	Group	No.	AAR	ACAR -3,+3 window period	ACAR -1,+1 window period
Stay	Total	2423	0.0008	0.0027	0.0002
			2.0260 ***	2.4530 ***	0.1998
1	A	1564	0.0014	0.0044	0.0017
			3.3583 ***	4.0277 ***	17.2507 ***
2	B	630	-0.0003	-0.0010	-0.0028
			-0.8161	-0.8848	-3.6690 ***
3	C	228	0.0003	0.0010	-0.0019
			0.7325	0.8650	-2.5085 ***

Rating	Difference	No.	AAR	ACAR -3,+3 window period	ACAR -1,+1 window period
Hypothesis 2.3	A > B > C				
	A - B		0.0017	0.0054	0.0045
			82.4792 ***	97.0612 ***	124.3307 ***
	B - C		-0.0006	-0.0019	-0.0009
			-26.4787 ***	-29.9258 ***	-20.9891 ***
	A - C		0.0011	0.0034	0.0036
			35.9259 ***	43.2737 ***	69.4314 ***

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

5.1.2. CAAR in Window Period for Ratings Change

Figure 4 shows the cumulative AAR around the event date when the analyst revised their

ratings up and down. The upgraded ratings cumulative AAR shows an upward sloping which

indicates that the abnormal return has been increasing from the day -3 until day +3, however, we

also observe that at day 5 to 7, the slope of the curve is flatter compared to the beginning of the

period, which also imply that the positive effect of the positive announcement declined through

times. For the downgraded rating cumulative AAR, the downward sloping graph indicates the

negative impact of the downgraded ratings which also correspond with the finding of the

significantly negative AAR and ACAR in **table 6.**

Figure 4: Cumulative Abnormal Return for Ratings Change
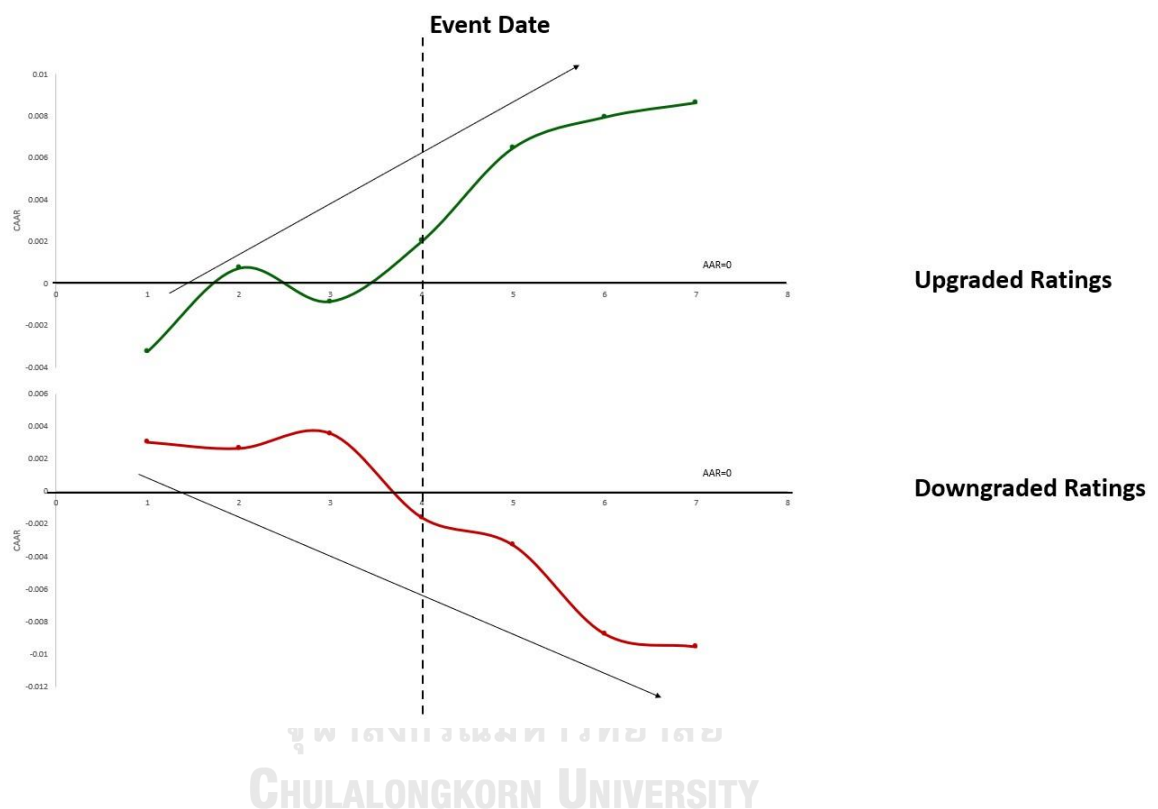
5.2   Market Reaction to Target Price announcement

Objective: to test whether the greater magnitude of change of the new target price makes

market reacts more aggressive.

Table 8 presents the results of univariant analyses to test Hypothesis 3. The results are

consistent with Hypothesis 3 as they show significantly positive difference between Q4 and Q1 in

"UP target price sub-group", but significantly negative difference between Q4 and Q1 in "DOWN

target price sub-group". This means Thai market reacts positively stronger to higher upgraded

target price, but negatively stronger to lower downgraded target price. Moreover, such reaction is

explained in (Ishigami and Takeda 2018) that large increase in target price only happens when

analyst is considered to have a very optimistic view about business's outlook and earnings

compared with when the increase is small, vice versa.

Table 8: Market Reaction to Target Price Announcement

Market Reaction to Target Price announcement

The results show significantly positive difference between Q4 and Q1 in "UP target price sub-group", but significantly negative difference between Q4 and Q1 in "DOWN target price sub-group". This means Thai market reacts positively stronger to higher than75% upgraded of target price than to less than 25% upgraded, ad also reacts negatively stronger to higher than 75% downgraded of target price than to less than 25% downgraded. ***,**,* refer to Statistical significance at the 1%, 5%, and 10% level, respectively.

Target Price	Q	No.	AAR	ACAR	ACAR
				-3,+3 window period	-1,+1 window period
Up	Total		0.0042	0.0142	0.0087
			10.2888 ***	13.0572 ***	11.3074 ***
	Q1		0.0008	0.0067	0.0003
			1.9384 *	6.1001 ***	0.4449
	Q2		0.0029	0.0079	0.0073
			6.9207 ***	7.2108 ***	10.2592 ***
	Q3		0.0035	0.0123	0.0067
			8.2613 ***	11.0862 ***	8.5387 ***
	Q4		0.0097	0.0297	0.0207
			23.3147 ***	27.0458 ***	26.6845 ***
Down	total		-0.0010	-0.0036	-0.0046
			-2.3970 ***	-3.2519 ***	-5.8791 ***
	Q1		0.0030	0.0063	-0.0020
			6.8915 ***	5.4087 ***	-2.4962 ***
	Q2		-0.0012	-0.0095	-0.0047
			-0.0001	-0.1315	-6.1196 ***
	Q3		-0.0038	-0.0022	-0.0046
			-9.0713 ***	-1.9661 ***	-5.8480 ***
	Q4		-0.0019	-0.0087	-0.0068
			-4.6257 ***	-7.9390 ***	-8.7391 ***
Rating	**Difference**	**No.**	**AAR**	**ACAR**	**ACAR**
				-3,+3 window period	-1,+1 window period
Up	Q4-Q1		0.0089	0.0230	0.0204
			21.3453 ***	20.9151 ***	28.2967 ***
Down	Q4-Q1		-0.0049	-0.0150	-0.0047
			-11.8677 ***	-13.6024 ***	-6.5550 ***

5.2.1 CAAR in Window Period for Target Price Change

Figure 5 shows CAAR around the event date when analysts revised their target price up

and down. The upgraded target price CAAR shows that upward sloping line which match with the

findings that market is significantly react positive to the upgraded target price. The graph shows a

very steep slope at the beginning of the window period and become flatter and flatter towards the

end (and shows the turnaround sign at day 7), this means that the abnormal return from the event

is not the permanent effect, and the market reaction decreases through times. This effect is also

applied with the downgraded CAAR curve which represent the downward trend that has the

pickup sign at the last day of the window period. From the graph, it can be implied that, as

mentioned in the (Ishigami and Takeda 2018) that the negative reactions are mostly short-term,

and the aggressiveness also decline overtime.

Figure 5: Cumulative Abnormal Return for Target Price Change
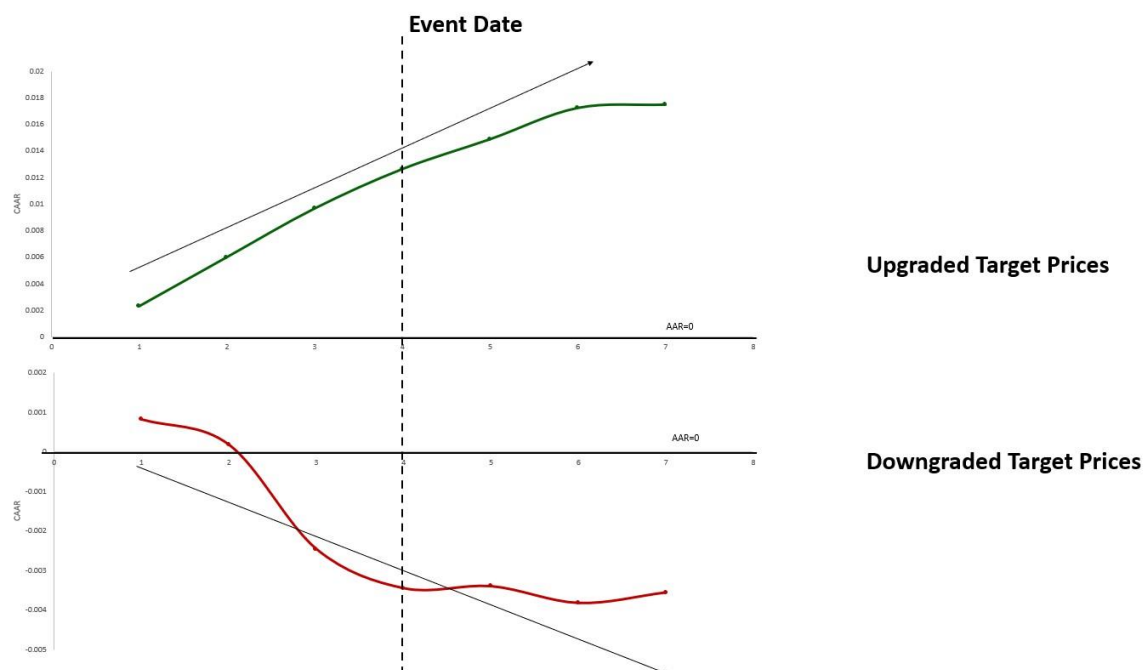
5.3 Market Reaction to Combination of BOTH Ratings and Target Prices

   Objective: to test whether the market reacts differently to the different direction of target price change given the same direction of change of ratings.

   Table 9 presents univariate analyses to Hypothesis 4.1-4.3 as follows.

   This experiment is set by comparing AAR and ACAR among different direction of change in target price within the same group of rating change (in these hypotheses. The focused rating- groups are total upward change and total downward change, and 2>1, 3>2, 1>2, and 2>3).

   The results are consistent with Hypothesis 4.1-4.2 as they show that the means of 3 groups with different directional changes (Up, Stay, Down) of target price are significantly different at 1% level and the market reacts significantly more positive to a group that contains upgraded rating with upgraded target price compared with group that contains upgraded rating but downgraded target price, while responses significantly more negative to group that contains downgraded rating with downgraded target price compared with a group that contains downgraded rating but upgraded target price. Our results are also supported by (Asquith, Mikhail et al. 2005) and (Ishigami and Takeda 2018) that find correlation between the target price and the content of the report, thus, even for the same rating, market reacts differently according to the directions of the changes of target price.

Table 9: Market Reaction to the Combination of Both Ratings and Target Prices

Market Reaction to Combination of BOTH Ratings and Target Prices

Hypothesis 4.1-4.2: The means of 3 groups with different directional changes (Up, Stay, Down) of target price are significantly different at 1% level and the market reacts significantly more positive to a group that contains upgraded rating with upgraded target price compared with group that contains upgraded rating but downgraded target price, while responses significantly more negative to group that contains downgraded rating with downgraded target price compared with a group that contains downgraded rating but upgraded target price.

Hypothesis 4.3: The results show the significant different in the means of the upgraded target price and downgraded target price at 1% level in every maintained rating groups (maintained BUY, maintain HOLD, maintained SELL) which imply that Thai market reacts differently according to the direction od change of target price even when the rating is maintained.

Rating	TP	No.	AAR	ACAR -3,+3 window period	ACAR -1,+1 window period
Up	Total	148	0.0074	0.0147	0.0088
			17.9431 ***	13.4118 ***	11.3383 ***
	Up	91	0.0101	0.0134	0.0107
			24.3805 ***	12.2121 ***	13.7264 ***
	Stay	32	-0.0009	0.0195	0.0044
			-2.0856 ***	17.5616 ***	5.5915 ***
	Down	25	0.0084	0.0133	0.0078
			19.9470 ***	11.9218 ***	9.8932 ***
Down	Total	176	-0.0052	-0.0076	-0.0056
			-12.4671 ***	-6.8141 ***	-7.1335 ***
	Up	39	-0.0004	-0.0042	0.0176
			-0.8867	-3.7904 ***	22.4554 ***
	Stay	52	-0.0038	0.0078	-0.0051
			-9.1555 ***	7.0185 ***	-6.5391 ***
	Down	85	-0.0083	-0.0185	-0.0142
			-19.7262 ***	-16.6765 ***	-18.0511 ***
2 > 1	Total	100	0.0067	0.0159	0.0077
			16.0553 ***	14.4507 ***	9.8396 ***
	Up	63	0.0097	0.0126	0.0088
			23.1562 ***	11.4612 ***	11.2939 ***
	Stay	21	-0.0013	0.0153	0.0063
			-3.0091 ***	13.7499 ***	7.9971 ***
	Down	16	0.0053	0.0300	0.0049
			12.4645 ***	26.6206 ***	6.2041 ***
3 > 2	Total	31	-0.0003	0.0001	-0.0053
			-0.6784	0.0747	-6.8034 ***
	Up	18	0.0007	0.0024	0.0000
			1.6081	2.1051 ***	0.0057
	Stay	7	0.0046	0.0318	-0.0110
			8.4394 ***	21.9416 ***	-11.0216 ***
	Down	6	-0.0073	-0.0368	-0.0109
			-15.6209 ***	-29.6489 ***	-12.7338 ***
1 > 2	Total	120	-0.0051	-0.0060	-0.0025
			-12.1187 ***	-5.3528 ***	-3.1722 ***
	Up	23	0.0035	0.0133	0.0353
			8.1727 ***	11.8825 ***	44.5262 ***
	Stay	36	-0.0031	0.0082	-0.0030
			-7.2960 ***	7.3415 ***	-3.7831 ***
	Down	61	-0.0095	-0.0216	-0.0165
			-22.7089 ***	-19.4403 ***	-21.0001 ***
2 > 3	Total	26	-0.0053	-0.0078	-0.0085
			-12.5477 ***	-6.9535 ***	-10.8034 ***
	Up	10	-0.0014	-0.0323	-0.0138
			-3.2980 ***	-28.9572 ***	-17.5204 ***
	Stay	9	-0.0097	0.0167	-0.0151
			-20.1495 ***	13.1121 ***	-17.2649 ***
	Down	7	-0.0052	-0.0041	-0.0184
			-11.7037 ***	-3.4660 ***	-22.2430 ***

Stay 1	Total	1565	0.0014	0.0044	0.0017
			3.3583 ***	4.0277 ***	17.2507 ***
	Up	220	0.0059	0.0225	0.0120
			14.1960 ***	20.4904 ***	15.5197 ***
	Stay	1105	0.0007	0.0023	0.0004
			1.7878 *	2.1339 ***	0.4845
	Down	240	0.0002	-0.0027	-0.0019
			0.5489	-2.4725 ***	-2.4728 ***
Stay 2	Total	630	-0.0003	-0.0010	-0.0028
			-0.8161	-0.8848	-3.6690 ***
	Up	64	-0.0010	0.0026	-0.0023
			-0.0190	0.0180	-2.9171 ***
	Stay	497	-0.0003	-0.0016	-0.0029
			-0.6401	-1.4294	-3.7640 ***
	Down	69	-0.0002	0.0000	-0.0028
			-0.5152	0.0195	-3.5945 ***
Stay 3	Total	228	0.0003	0.0010	-0.0019
			0.7325	0.8650	-2.5085 ***
	Up	28	-0.0088	0.0033	-0.0085
			-20.0827 ***	2.8251 ***	-10.5536 ***
	Stay	170	0.0018	-0.0010	0.0000
			4.3636 ***	-0.8787	-0.0530
	Down	30	0.0002	0.0097	-0.0066
			0.5718	8.3747 ***	-8.2208 ***

| Rating	Difference	No.	AAR	ACAR	ACAR
				-3,+3 window period	-1,+1 window period
Hypothesis 4.1					
Up	Up-Stay-Down		0.0026	-0.0194	-0.0015
			6.0680 ***	-17.0861 ***	-2.0009 **
Down	Up-Stay-Down		0.0117	0.0065	0.0369
			27.9800 ***	5.8313 ***	50.8033 ***
Hypothesis 4.2					
2 > 1	Up-Stay-Down		0.0056	-0.0326	-0.0024
			13.0812 ***	-28.6945 ***	-3.2561 ***
3 > 2	Up-Stay-Down		0.0034	0.0074	0.0220
			6.5971 ***	5.4066 ***	24.6385 ***
1 > 2	Up-Stay-Down		0.0161	0.0267	0.0548
			37.3535 ***	23.5114 ***	73.5945 ***
2 > 3	Up-Stay-Down		0.0163	0.0197	0.0473
			30.7581 ***	14.0800 ***	51.5662 ***
Hypothesis 4.3					
stay 1	Up-Down		0.0057	0.0252	0.0140
			292.0490 ***	491.3568 ***	415.5043 ***
stay 2	Up-Down		-0.0008	0.0026	0.0006
			-15.5872 ***	18.5830 ***	6.3366 ***
stay 3	Up-Down		-0.0091	-0.0064	-0.0019
			-113.8053 ***	-30.2959 ***	-14.0193 ***

Moreover, the results also show the significant different in the means of the upgraded

target price and downgraded target price at 1% level in every maintained rating group (maintained

BUY, maintain HOLD, maintained SELL) which imply that Thai market reacts differently

according to the direction od change of target price even when the rating is maintained. Even though that finding is inconsistent with Hypothesis 4.3, but consistent with (Ishigami and Takeda 2018) that find a significantly positive means different in all directions of change in target price in every maintained rating groups.

5.3.1   CAAR in Window Period for the Combination of Rating and Target Price Change

Figure 6 shows the CAAR around the event date when the effect of rating change and target price change are combined. The first graph which is the combination of upgraded ratings with upgraded, maintained, and downgraded target prices shows the upward sloping for all the lines. From the graphs, they imply that even with the same direction of ratings change, investors react differently according to the direction of change in target price which is consistent with the results that find the significantly different means between all sub-groups. For the below picture, even though all three lines are the downward sloping, however, the downed rating with upgraded target price CAAR still stay above the zero abnormal return line which correspond with Asquith et al. (2005) which find that even within downgraded rating group, upgraded target price can decrease the decline in AR and CAR.

Figure 6: Cumulative Abnormal Return for the Combination of Rating and Target Price Change
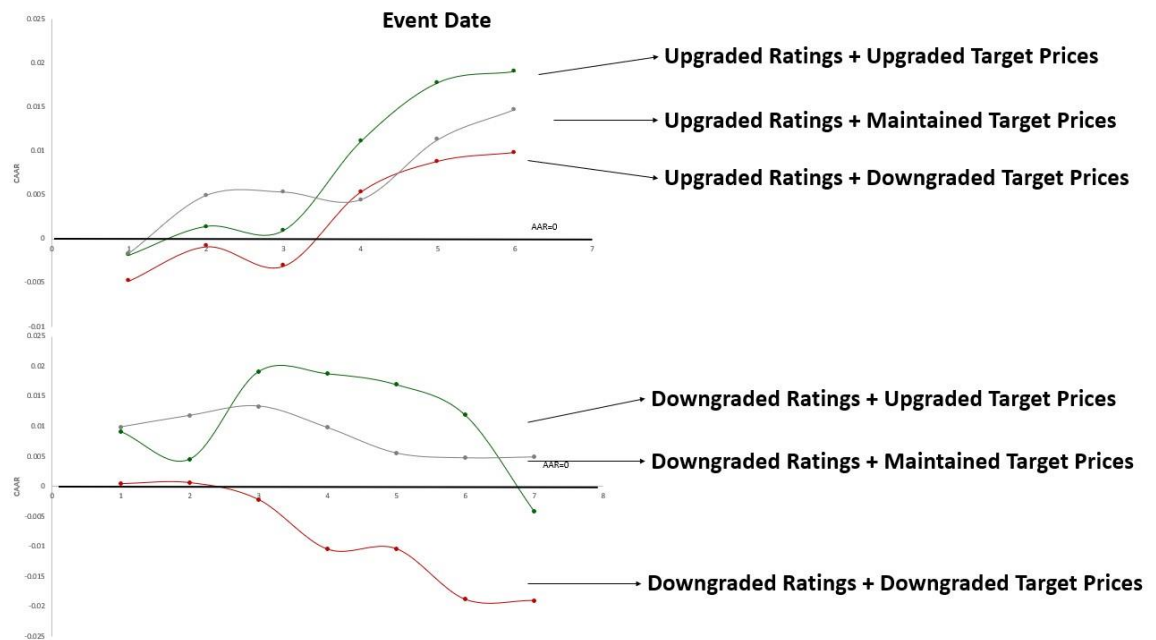
5.4 Correlation Between Market Reaction and Analysts' Announcement Study

Objective: to test if there is a positive correlation between market prices and changes in ratings and target prices.

According to the results from hypothesis 2-4.3, we can conclude that there is a significant correlation at 1% level between market prices and analysts' announcement as in every type of announcements (change in rating and target price alone or the mixed of both), AAR around the event date always be greater or less than 0 depending on the direction of change (positive or negative). The results are corresponding with Lloyd-Davies and Canes (1978), Womack (1996), Brave and Lehavy (2003) and many research paper across the world that study the correlation of market price movement and analysts' announcement and find the significant abnormal return from both the event date itself and days around the event date.

Chapter 6

Conclusion

Although, the correlation between market price movements and analysts' announcement have long been studied in the US market, the research on the announcements using Asian countries data has till way behind, especially in Thai stock market. To catch up with the Western world, this study aims to perform a comprehensive analysis of the effects of the stock ratings and target prices announcement published by analysts from both domestic and foreign brokerage firms in the Thai market. In this research, I focus on 3 major examinations, which are, to test 1. whether the market reacts differently to the different magnitude of change in analysts' ratings, 2. whether the greater magnitude of change of the new target price effects the degree of aggressiveness the market will react, and 3. whether the market reacts differently to the different direction of target price change given the same direction of change of ratings. In the end, the study find that the market responses are affected by not only the direction of changes in analyses' announcement, but also the magnitude of change in both rating and target price.

I acknowledge limitations if this research as the Thai data is limited and many small stocks in the market that has lower liquidity are mostly ignored by the well-known brokerage house. Therefore, for future improvement, different technique such as different source of data mining (rather than Bloomberg) should be sued. Nonetheless, I expect this research to deliver more insight understanding about the investment behavior of the investors to all stakeholders in the finance.

REFERENCES

Asquith, P., M. B. Mikhail and A. S. Au (2005). "Information content of equity analyst reports." Journal of Financial Economics **75**(2): 245-282.

Bradley, D. J., B. D. Jordan and J. R. Ritter (2008). "Analyst Behavior Following IPOs: The "Bubble Period" Evidence." The Review of Financial Studies **21**(1): 101-133.

Brav, A. and R. Lehavy (2003). "An Empirical Analysis of Analysts' Target Prices: Short-term Informativeness and Long-term Dynamics." The Journal of Finance **58**(5): 1933-1967.

Charoenwong, B., S. Nettayanun and K. Saengchote (2021). "Digesting anomalies: A q-factor approach for the Thai market." Pacific-Basin Finance Journal **69**: 101647.

Das, S., C. B. Levine and K. Sivaramakrishnan (1998). "Earnings Predictability and Bias in Analysts' Earnings Forecasts." The Accounting Review **73**(2): 277-294.

Fama, E. F. and K. R. French (1993). "Common risk factors in the returns on stocks and bonds." Journal of Financial Economics **33**(1): 3-56.

Fang, L. and A. Yasuda (2011). "Are Stars' Opinions Worth More? The Relation Between Analyst Reputation and Recommendation Values." Journal of Financial Services Research **46**.

Hall, J. L. and P. B. Tacon (2010). "Forecast accuracy and stock recommendations." Journal of Contemporary Accounting and Economics **6**(1): 18-33.

Hong, H. and J. D. Kubik (2003). "Analyzing the Analysts: Career Concerns and Biased Earnings Forecasts." The Journal of Finance **58**(1): 313-351.

Irvine, P. J. (2003). "The incremental impact of analyst initiation of coverage." Journal of Corporate Finance **9**(4): 431-451.

Ishigami, S. and F. Takeda (2018). "Market reactions to stock rating and target price changes in analyst reports: Evidence from Japan." Journal of International Financial Markets, Institutions and Money **52**: 134-151.

Lin, H.-w. and M. F. McNichols (1998). "Underwriting relationships, analysts' earnings forecasts and investment recommendations." Journal of Accounting and Economics **25**(1): 101-127.

Lloyd-Davies, P. and M. Canes (1978). "Stock Prices and the Publication of Second-Hand Information." The Journal of Business **51**(1): 43-56.

Lys, T. and S. Sohn (1990). "The association between revisions of financial analysts' earnings

forecasts and security-price changes." Journal of Accounting and Economics **13**(4): 341-363.

Michaely, R. and K. L. Womack (2015). "Conflict of Interest and the Credibility of Underwriter Analyst Recommendations." The Review of Financial Studies **12**(4): 653-686.

Mikhail, M. B., B. R. Walther and R. H. Willis (1997). "Do Security Analysts Improve Their Performance with Experience?" Journal of Accounting Research **35**: 131-157.

Stickel, S. E. (1992). "Reputation and Performance Among Security Analysts." The Journal of Finance **47**(5): 1811-1836.

Womack, K. L. (1996). "Do Brokerage Analysts' Recommendations Have Investment Value?" The Journal of Finance **51**(1): 137-167.

VITA

NAME	Talatarn Kromadit
DATE OF BIRTH	7 November 1993
HOME ADDRESS	99/688 Supalai River resort, Thinburi, Som Rea, 10600

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY