

Analysis Of Retail Sector Market Reaction In Indonesia On Social Media And Investor Sentiment

Khaerunnisa Nur Fatimah Syahnur^{1*}, Dewi Fatmarani Suriyanto², Muhammad Try Dharsana³

^{1*}Institut Teknologi dan Bisnis Kalla, Makassar, Office Building Nipah Mall, Jl. Urip Sumoharjo, Panaikang, Kec. Panakkukang, Kota Makassar, Sulawesi Selatan, 90231

²Universitas Negeri Makassar, Jl. Pendidikan I No.27, Tidung, Kec. Rappocini, Kota Makassar, Sulawesi Selatan, 90222

³Universitas Hasanuddin, Makassar, Jl. Perintis Kemerdekaan KM 10, Tamalanrea, Kota Makassar, Sulawesi Selatan, 90245

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Correspondence Email:

khaerunnisanfsyahnur@kallabs.ac.id

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ABSTRACT

This study aims to examine the effect of social media and investor sentiment on the market reaction of the retail sector in Indonesia. Content analysis determines investor sentiment obtained from social media. Information related to the 2019 Indonesian presidential election was used for content analysis. The study results provide evidence that the information available on social media and online investor sentiment have a positive effect on the market reaction of the retail sector in Indonesia. This study also supports the use of signal theory to explain the effect of information available on social media on the capital market in Indonesia.

ABSTRAK

Penelitian ini bertujuan untuk menguji pengaruh media sosial dan sentimen investor terhadap reaksi pasar sektor retail di Indonesia. Analisis konten digunakan untuk penentuan sentimen investor yang diperoleh dari media sosial. Informasi terkait pemilihan umum presiden Indonesia tahun 2019 menjadi fokus analisis konten dalam penelitian ini. Hasil penelitian memberikan bukti bahwa informasi yang tersedia di dalam media sosial dan sentimen investor berpengaruh positif terhadap reaksi pasar sektor retail di Indonesia. Penelitian ini juga mendukung penggunaan teori sinyal untuk menjelaskan pengaruh informasi yang tersedia di media sosial terhadap pasar modal di Indonesia.



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INTRODUCTION

The flow of information available to the public through current technological developments has been shown to influence individual thought patterns and behaviour. The influence of widely disseminated information with easier access is considered to control many parties, one of which is investors (Yang, et al., 2017). The use of social media such as Twitter, which collects millions of information from various parts of the world, has proven to help investors make decisions regarding their investments (Bartov et al., 2018) (Mcgurk et al., 2019). The result of investors' behaviour and actions related to their investment decisions allows the emergence of market reactions that will affect stock prices (Blajer-gołębiewska et al., 2018).

Market reactions resulting from an investor's decision-making are caused by investor optimism and pessimism (Naughton et al., 2019). Investor optimism and

pessimism are then termed investor sentiment (Baker & Wurgler, 2006). Several previous studies have tried to prove the relationship between investor sentiment and stock prices (Guo et al., 2017) (Renault, 2017) (Huang, 2018). Guo et al. (2017) provided empirical evidence showing that investor sentiment cannot always significantly predict stock prices. The selection of proxies in measuring sentiment needs to be considered to see the effect of sentiment on market reactions.

Renault's research (2017) gave different results, with empirical evidence showing that intraday stock returns in one of the online stock trading platforms are influenced by investor sentiment. Another study related to the role of investor sentiment was conducted by Chau et al. (2016), which examined the impact of investor sentiment and its manifestations on the trading behavior of investors in the US, and the results show that investor sentiment is induced by buying and selling by investors is an essential determinant of stock price variations (Chau et al., 2016).

Indonesia in 2019 was in the third tier with the most active and widely distributed social media users in the world, with a growth rate of 15% per year or equivalent to 20 million users (Kemp, 2020). Indonesia is also the 9th country with the most Twitter users globally, equivalent to 6,425,000 users. The presence of social media as a medium for disseminating information that is very fast, easy to access, but not fully accurate, and can be responded to by various parties such as investors and potential investors can trigger investor sentiment, which will affect the company's stock price. Thus, changes in the company's stock price due to investor reactions do not fully reflect the company's fundamental value but are based on investors' emotions, optimism, and pessimism.

The signal theory emphasizes how information asymmetry can be reduced between two parties. Information asymmetry can occur when one party has more or better information than the other parties (Spence, 1973). Connelly et al., (2011) stated that the core idea of signaling theory is that signalers are insiders (executives or managers) who have access to information and knowledge that is not available to recipients who are outsiders. However, in the development of the application of signal theory, this statement was further developed in the research of Guldiken, et al., (2017) which proved that several studies (Daniel & Titman, 2006) (Deephouse, 2000) show that signals do not have to come from executives or managers.

Chahine & Malhotra (2018) stated that the presence of social media can be used as a signaling mechanism aimed at customers and investors with a two-way communication feature that allows signal receivers to provide input to signal senders quickly. Several previous studies have also provided evidence regarding the signals given by the media online in the form of information on company activities such as IPO, SEO, company political activities, and purchasing decisions (Chen et al., 2019) (Cheung et al., 2014) (Guldiken et al., 2017).

Guldiken et al., (2017) stated that the main reason media coverage of companies serves as an essential signal that investors use to form their impression of the company is that the signals conveyed through the media are observable, low cost, reliable, and

can be compared with other information at the same time (Torkzadeh & Dhillon, 2002). However, some information about company activities available on social media does not always provide the same direction for all companies. The direction of influence of the company's activities can be in the form of a positive or negative direction (Hartono, 2018). Hartono (2018) showed that earnings announcement events can have a positive or negative trend for different companies. This depends on the information content of earnings announcement events.

Chiou et al., (2019) tested stocks whose information is available on social media on their stock performance. The results empirically show that information on social media related to a company's stock can affect investors' cognition and emotions regarding their investment decisions, which will impact the performance of a company's stock. Consistent with the research of Lei et al., (2015) and Ali (2018), which proved that information from social media related to a company's stock is a strong signal that will affect investor optimism and pessimism, which impacts investment decisions. Therefore, the developed hypothesis is as follows. **H1:**The accumulation of social media information has a positive effect on investor sentiment.

Zhang et al., (2016) tested the direct effect of information from the media on stock prices. Zhang et al., (2016) tested the variation of stock returns and trading volume after the news was announced in the Ahead of Stock Market on NetEase, which is the largest internet content provider in China. The empirical results of the study showed a positive and significant effect on abnormal returns on the date of the event. Consistent with research conducted by Fang et al., (2018) on the capital market in China, the results show that stocks that are frequently informed in media reports (media coverage) in China tend to have higher abnormal stock returns in the long term than companies that are less covered by media.

Several previous research results prove that information available on social media can influence market reactions (Fang et al., 2018) (Naughton et al., 2019) (Yu et al., 2013). According to Hartono (2018), the market will react because the events contain an economic value that can change the company's value, so the previous stock price needs to be revised using the value of the new information. This is evidenced in the research of Oehler et al., (2013), which stated that general election events that occur in the United States can have a positive or negative impact on abnormal returns in several industrial sectors, which can be caused by campaigns or information related to new policies submitted by presidential and vice-presidential candidates on firm value. So that, **H2:**Information accumulation on social media has a positive effect on market reactions.

Sul et al., (2017) used a proxy for investor sentiment in the form of positive and negative sentiments from social media Twitter on the Cumulative Abnormal Return (CAR) of shares of companies listed in the S&P 500 index. The research results by Sul et al. (2017) showed that positive and negative sentiments or cumulative sentiments originating from Twitter social media towards companies specifically have a significant impact on stock returns on the next trading day. This study also proves that investors

currently make decisions regarding their investments using various sources of information, one of which is Twitter.

Sprenger et al., (2014) tested signals in the form of information from Twitter social media, which could mean selling, buying, or saving, which were classified using Naïve Bayes. His research provided evidence for researchers and financial analysts that the information available on Twitter social media is known. The term tweet can be a helpful proxy in explaining investor behaviour. This is evidenced in his research which shows an increase will follow an increase in positive sentiment related to company shares in share prices. Thus, the developed hypothesis is as follows. **H3:**Investor sentiment has a positive effect on market reaction.

This study has several contributions to the literature. First, this study contributes to the literature on information available on social media, investor sentiment, and market reaction using signal theory (Cheung et al., 2014) (Chahine & Malhotra, 2018) (Daniel & Titman, 2006) (Deephouse, 2000)(Guldiken et al., 2017). Second, this research can provide evidence to companies regarding the role of social media in their company performance and as material for consideration regarding the company's strategy in dealing with the development of social media as a means of two-way communication with consumers.

RESEARCH METHOD

This research uses an event study approach. An event study is a study that studies the market reaction to an event whose information is published as an announcement (Hartono, 2018). This study analyzes the influence of information or events related to government-related announcements (Hartono, 2018), namely, the 2019 Indonesian presidential election (PEMILU) circulating on Twitter and Stockbit social media. The 2019 Indonesian Elections event selection was based on information from Google Trends, which showed that the 2019 Indonesian General Elections event was the topic with the highest searches reaching more than 2 million searches during April 2019. This means that information related to the 2019 Elections is widely spread. Nationally and internationally and will impact activities in the capital market.

The population in this study is all shares listed in LQ45. This study applies several sample selection criteria as follows (Hartono, 2018) .

1. Companies engaged in the retail sector.
2. The company is included in the LQ45 index report from February to July 2019.
3. The company is included as recommended by the research results of three securities companies, RHB Sekuritas Indonesia, Henan Putihrai Sekuritas, PT. Samuel Sekuritas Indonesia is related to the 2019 Indonesian presidential election events.
4. To avoid confounding effects, the company does not take corporate actions such as distribution of dividends, stock splits, mergers, and other events.

Total of 4 companies meet all of the above criteria. Table 1 shows a list of companies with stock codes that meet the research criteria. During the study period, four

companies had 211 pieces of information in the form of tweets and ideas from social media Twitter and Stockbit using # (hashtag) or \$ (cashtag) company stock codes.

Table 1 List of Shares that Meet the Research Criteria

No.	Stock Code	Company Name	Twitter Account
1.	SMGR	Semen Indonesia (Persero) Tbk.	@semenku
2.	GGRM	Gudang Garam Tbk.	@GudangGaramTBK
3.	HMSP	H.M. Sampoerna Tbk.	@HMSampoernaTbk
4.	UNVR	Unilever Indonesia Tbk.	@UnileverIDN

Variable Operational Definition

The accumulation of social media information is defined as the accumulation of information which can be in the form of facts that are usually conveyed by national news accounts such as Kompas and CNN and can be in the form of opinions from Twitter and Stockbit users, better known as tweets and ideas, on a company's stock.

The information selected in this study is limited to information using Indonesian. The data selection using one cashtag, hashtag, or one company share code ensures that the opinion provides explicit information regarding only one company share (Bartov et al., 2018).

This study adopts the method of determining investor sentiment conducted by Renault (2017) using machine learning. Information that has been collected from Twitter and Stockbit social media users is classified of positive and negative sentences using machine learning methods with the calculation of the Naïve Bayes classifier algorithm (Renault, 2017)(Bartov et al., 2018).

The reason for choosing the machine learning method in the classification of investor sentiment is because the use of the Naïve Bayes classifier algorithm can produce higher accuracy than the dictionary approach method (Bartov et al., 2018)(Ali, 2018)(Syahnur, Bijaksana, & Mubarok, 2016).

Market reaction is defined as a market response to events or information in the form of a surprise or something that is not expected (Hartono, 2018). The market reaction in this study is proxied by the accumulation of abnormal returns. The accumulation of abnormal returns is the sum of all the previous day's abnormal returns during the event period for each security (Hartono, 2018). The following formula can calculate Cumulative Abnormal Return (CAR) calculation. The control variables used in this study are based on previous research.

1. *SIZE* is the logarithm of the company's total assets (Bartov et al., 2018).
2. *TVA* is a measurement of the company's stock liquidity obtained from calculating the number of shares traded (volume) divided by the number of shares outstanding (Chiu et al., 2018)
3. *TURN* is the ratio between trading and the number of outstanding shares (Wu & Lin, 2017).

This study tested machine learning classification analysis to determine the positive or negative tone of tweets and ideas used by investor sentiment variables.

Furthermore, this study used pooled cross section analysis testing using STATA 14 software for hypothesis testing because the combination of data management capabilities, panel data analysis tools and statistical techniques makes STATA a preferred choice for conducting pooled cross-sectional analysis (Baum, 2006) .

RESULTS AND DISCUSSION

Information collected regarding the Indonesian presidential election in 2019 was 211 tweets and ideas from Twitter and Stockbit social media, using the hashtag (#) or cashtag (\$) symbols for the entire sample of companies. This information was collected from March 24, 2019, to May 19, 2019, the selection of this date was based on Google Trends because according to Bartov et al., (2018) Google Trends will display the popularity of search topics for a certain period. This study considers the confounding effects for each company, so it only uses the observation window period from April 9th, 2019, to April 14th, 2019, so that there are 134 tweets and ideas from social media Twitter and Stockbit that will be manually labeled to be used as a proxy for the independent variable on social media. Tweets and Ideas that are neutral from the results of manual labeling will not be included in the machine learning classification (Y. Yu et al., 2013).

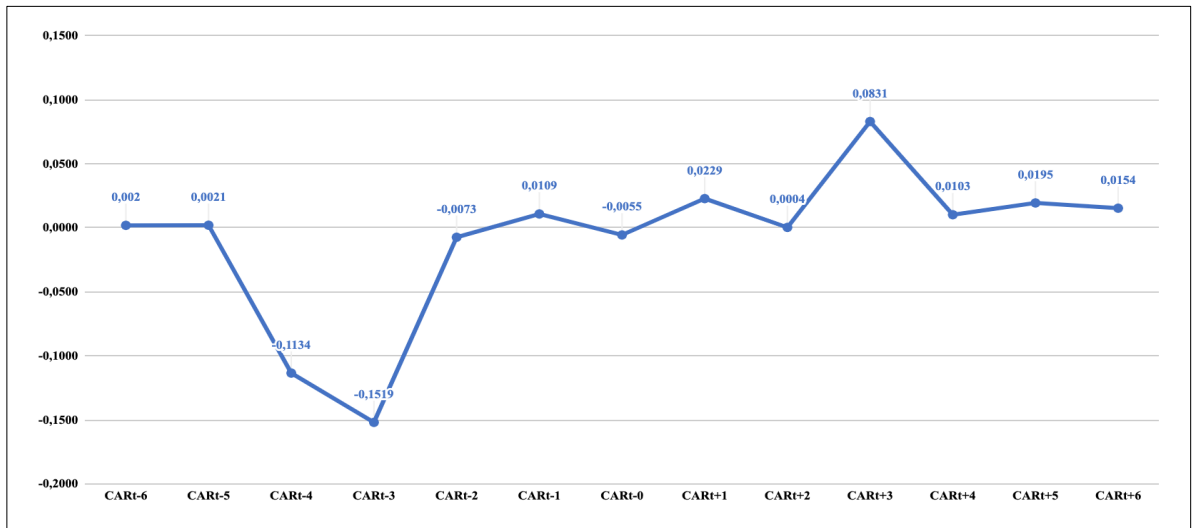
Event Study

The event study conducted by this study followed the study of Oehler et al., (2013) , Colón-de-armas & Rodriguez (2017), Boatwright et al., (2019), T. Yu & Huarng, (2019). This research window of events refers to the study of Boulland & Dessaint (2017), Bartov et al., (2018), Al-thaqeb (2018) , T. Yu & Huarng (2019) who used Google Trends or Google Search to find out an increase in the amount of information on the internet related to an event or product and used the event window for 13-14 days. Therefore, this study uses 6 days before the date of the Indonesian presidential election and 6 days after the date of the Indonesian presidential election, thus, this study predicts abnormal returns will occur 6 days before the date of the Indonesian presidential election ($t-6$) and 6 days after the date of the Indonesian presidential election ($t + 6$). Figure 1 shows a graph of the change in the proxy for the market reaction variable in this study which as a whole shows a positive value and has increased rapidly from $t-1$ to $t + 6$. Overall, it is known that the market has reacted positively to the events of the 2019 Indonesian

Presidential Election.

Figure 1 Cumulative Abnormal Return of Indonesian General Election in 2019

Source: data processing using STATA14



Machine Learning Classification

This study uses a machine-learning classification following the research of (Brown, 2012) Sprenger et al., (2014) and Renault (2017) which uses the Naïve Bayes classifier algorithm to group all information used in this study into positive classes or negative and is a proxy for the independent variable investor sentiment.

Table 2 shows the calculation results from using the machine learning classifier. The precision in Table 2 shows the ratio of relevant information based on human judgment to the number of opinions determined by the classifier. The precision results for positive class information are 75,61% and negative class information is 65,38%. Recall in Table 2 shows the ratio or success rate of the classifier in redefining relevant information. The recall results for positive class information were 77,50% and negative class information was 62,96%. Meanwhile, the accuracy result shows the number 71,64%, which means that the accuracy of the machine classifier in determining the test data in this study is 71,64%. Accuracy results for sentiment data analysis are influenced by the amount of data used (Althnian et al., 2021).

Table 2 Machine Learning Classification Results

Description		Positive Class		Negative Class	
Precision	The correct number of classes	62	75,61%	34	65,38%
	The number of classes obtained (sum class of machine-labeled)	82		52	
Recall	The correct number of classes	62	77,50%	51	62,96%
	The amount of data (hand-labeled class)	80		84	
Accuracy	71,64%				

Source: Data processing using Microsoft Excel

Hypothesis Testing

Hypothesis testing in this study uses pooled cross-section regression analysis. Table 3 summarizes the overall results of testing the first hypothesis through pooled cross-section regression analysis. Based on the results of testing the first hypothesis in this study, there is sufficient evidence to support the first hypothesis, so it can be concluded that the accumulation of social media information (AIMS) positively affects investor sentiment.

Table 3 Results of Hypothesis 1 Regression Test with Robust Std. Error

Description Hypothesis 1		Unstandardized Coefficients		t	Sig
		B	Std. Error		
H1	(Constant)	-34,78	18,765	-1,85	0,070
	AIMS	0,447	0,050	8,95	0,000***
	SIZE	0,575	0,330	1,74	0,088*
	TVA	-1065	567,0	-1,88	0,067*
	TURN	0,855	0,578	1,48	0,146
F	91,44				
Sig	0,000***				
Adj R ²	0,872				
*, **, *** significant level 10%, 5%, 1%					

Source: data processing using STATA14

The second hypothesis examines the effect of social media as an independent variable and market reaction (CAR) in the 2019 Indonesian presidential election as the dependent variable, and SIZE, TVA, and TURN as control variables. Table 4 summarizes the overall results of testing the second hypothesis. The results of testing the second hypothesis in this study show that the accumulation of social media information on market reactions to the 2019 Indonesian presidential election has a significant positive effect.

Table 4 Results of Hypothesis 2 Regression Test with Robust Std. Error

Description Hypothesis 2		Unstandardized Coefficients		t	Sig
		B	Std. Error		
H2	(Constant)	0,0671	0,658	1,02	0,313
	AIMS	-0,007	0,0015	-5,04	0,000***
	SIZE	-0,025	0,010	-2,46	0,018**
	TVA	30,95	19,34	1,60	0,116
	TURN	-0,002	0,017	-0,15	0,882
F	16,00				
Sig	0,000***				
Adj R ²	0,4126				
*, **, *** significant level 10%, 5%, 1%					

Source: data processing using STATA14

The third hypothesis examines the effect of investor sentiment and market

reaction. Table 5 summarizes the overall results of testing the third hypothesis. The results of testing the third hypothesis in this study show that investor sentiment has a significant positive effect on market reactions to the 2019 Indonesian presidential election.

Table 5 Results of Hypothesis 3 Regression Test with Robust Std. Error

Description Hypothesis 3		Unstandardized Coefficients		t	Sig
		B	Std. Error		
H3	(Constant)	0,0671	0,658	1,02	0,313
	SENTM	0,008	0,0035	2,54	0,015**
	SIZE	-0,025	0,010	-2,46	0,018**
	TVA	30,95	19,34	1,60	0,116
	TURN	-0,002	0,017	-0,15	0,882
F			16,00		
Sig			0,000***		
Adj R ²			0,4126		
*, **, *** significant level 10%, 5%, 1%					

Source: data processing using STATA14

In general, this study supported research conducted by Chahine & Malhotra (2018) and Guldiken et al., (2017) which shows that the application of signal theory can explain the effect of information available on social media on the capital market in Indonesia. The results of this study also support the study conducted by Chiou et al., (2019) which provides evidence that information available on social media can affect investors' cognitive and investors emotions regarding their investment decisions.

The study conducted by Lei et al., (2015) and Ali (2018) also show that information from social media related to a company's stock becomes a strong signal that will affect investor optimism and pessimism or what is called investor sentiment (Baker & Wurgler, 2006). Thus, it can be concluded that the information available on Stockbit and Twitter social media in Indonesia can affect investors' emotions in the form of optimism and pessimism about the 2019 Indonesian presidential election and supports hypothesis 1 in this study.

This study's testing hypothesis 2 shows a significant positive effect of investor sentiment on market reactions or cumulative abnormal returns. This study supports the study conducted by Zhang et al., (2016) which shows a positive effect of information on the most significant internet content provider in China on the abnormal returns of issuers' shares in the event period.

The positive effect of investor sentiment on market reaction in this study supports the study conducted by Sul et al., (2017) and McGurk et al., (2019). Sul et al. (2017) used cumulative sentiment (positive and negative) on cumulative abnormal returns of stocks, and the results show that sentiment on tweets is closely related to individual stock returns. Another study conducted by McGurk et al. (2019) examines the effect of investor sentiment on abnormal returns. The results show that positive

sentiment is associated with an increase in the abnormal return of an issuer's stock. The same results were also proven in Bartov et al., (2018) study that online investor sentiment or investor sentiment available on social media influences issuer stock returns.

The event study approach used in this research shows that the market reaction to Indonesia's presidential election in 2019 is similar to the research on market reactions to the presidential election in several countries, which generally gave a positive response to several industrial sectors (Oehler et al., 2013;). In general, this study also supported research conducted by Chahine & Malhotra (2018) and Guldiken et al., (2017), which shows that the application of signal theory can explain the effect of information available on social media on the capital market in Indonesia.

CONCLUSIONS

In general, this study examines the effect of the accumulation of social media information, investor sentiment, and market reaction on the 2019 Indonesian presidential election (PEMILU). The market reaction in this study was determined through an event study approach, and testing the effect between variables was determined through pooled analysis. Cross-section.

The event study approach shows that the market reaction to the 2019 Indonesian presidential election gave the same results as the market reaction to the presidential election in other countries in general. This research provides overall evidence that the market reacts positively to the 2019 Indonesian presidential election. The positive market reaction to the ELECTION events can be caused by investor sentiment, which is the emotions and behavior of investors regarding the returns they will get against the policies presented by the 2019 Indonesian presidential candidate pair.

This study has three hypotheses that test the influence between research variables in three different test models. Based on the results of the hypothesis testing that has been carried out, it is known that all the hypotheses in this study are supported. However, this study has several limitations related to research data and technical constraints. This study used a relatively short period of 13 days to avoid confounding effects. The criteria of this research also limit companies engaged in the retail sector. Another limitation of this research is that collecting information from social media Twitter and Stockbit is done manually, so it takes a longer time, and there is a possibility of errors in collecting the data.

Based on the research limitations presented above, further research with an event study approach can use a more extended period. Further research can also use other information or topics to see the effect of the accumulation of social media information in Indonesia. This is important because Indonesia has the third most active social media users globally.

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