

The Relationship between News Portals Sentiment and GoTo Stock Daily Price Movement

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Abstract

PT GoTo Gojek Tokopedia Tbk (GoTo), the first decacorn in Indonesia, has shown its commitment to supporting global sustainable development goals by 2030. GoTo started its Initial Public Offering on 11 April 2022, and has attracted national news portals to write about its business performances. This research investigates the relationship between news portal sentiment and GoTo stock daily price movement. Firstly, articles from news portals related to GoTo were collected from 12 April to 30 September 2022. Next, Netlytics monitoring tools were used to categorize articles as positive or negative sentiments, and the simple linear regression analysis was done using Microsoft Excel. The result shows a moderate positive correlation between news portals sentiment and GoTo stock daily price movement ($r = 0.41$; $p = 0.0018$), but it also proves that the former could not be used as a sole indicator to predict the latter ($R^2 = 0.1685$; $p = 0.0018$). Finally, it reveals that 32.7 % of articles with positive sentiment were published on the same days as the days with stock price increases, and the news about the increase in GoTo transactions and revenues dominated those articles.

Keywords

GoTo, Gojek Tokopedia, news portal, sentiment analysis, stock market, price movement, Netlytics

1. Introduction

PT GoTo Gojek Tokopedia Tbk is a company that was established by the merger of two prominent technology startups in Indonesia, Gojek and Tokopedia (Fahrezi & Nathasia 2022). GoTo

offers various services, such as ride-hailing, e-commerce, logistics and financial services, through its leading platforms, Gojek, Tokopedia and GoTo Financial (Fahrezi & Nathasia 2022). Gojek connects drivers and customers for ride-hailing and courier services through its application. Furthermore, Tokopedia is an online marketplace that connects merchants and customers through its platforms (Rizqyta 2021). Their latest platform after the merger, GoTo Financial, offers services such as digital wallets and credits for individuals and small to medium business units (Rizqyta 2021). Before the merger, Gojek and Tokopedia had already become decacorn and unicorn startups, respectively, making GoTo one of the first decacorn companies in Indonesia (Haryanto 2022).

GoTo was listed on the Indonesia Stock Exchange or Bursa Efek Indonesia on 11 April 2022, and its Initial Public Offering was the third largest in Indonesia after raising \$1.1 billion (Poh 2022). In order to support UN Sustainable Development Goals, GoTo determines key performance indicators called Three Zeros (Zero Emissions, Zero Waste and Zero Barriers) that align with global Sustainable Development Goal commitments by 2030 (cf. GoTo 2022). The Zero Barriers indicator focuses on improving their drivers and merchants' welfare by providing more income opportunities through the GoTo ecosystem (cf. GoTo 2022). As the GoTo ecosystem expands, more features are added, such as food delivery, shopping assistance, a moving house service, and many other services (cf. Gojek 2023). Thus, those features can benefit drivers and merchants to get more income sources (Rizqyta 2021). Furthermore, in line with their goals, GoTo stated that the company will give specific amounts of free GoTo stock to their Gojek drivers following their working period through its program called “saham gotong royong” (cf. Rahardian 2022).

After the merger, GoTo has implemented many strategies to increase their revenue, such as the GoTo – TOBA collaboration to supply 300 electric motorcycles for Gojek (cf. Timorria 2022), the launch of Jago Merchant in collaboration with Bank Jago to support small to medium business units in managing their finance (cf. Catriana 2021), and many other programs, and published them on news portals. However, news portals also reported that GoTo still recorded losses of up to 954.85 million \$ US from January to June 2022, which is more than double the loss of the previous year in the same period (cf. Maulida 2022).

Moreover, according to Gao et al. (2022), financial news could reflect market sentiment and credible news platforms could affect investors in making investment decisions. When investors read news articles, they will make their own interpretation of the current market conditions and sentiments (Li et al., 2014). The sentiment interpretation will then affect their decision-making towards investment, and investors' actions will impact the stock price movement (cf. Li et al. 2014).

Therefore, this research investigates the relationship between news portal sentiment and GoTo stock daily price movement. The hypothesis proposed in this research was that news portal sentiment would correlate with the daily movement of GoTo stock prices.

2. Literature Review

Previous studies aimed to find relations between news sentiment and stock price movement, and this research follows the use of several indicators, such as news sentiment, topics and platforms. A study by Li et al. (2020) designed a model to predict Hong Kong stock prices using a combination of technical indicators and news article sentiments. The stock data was collected from the Hong Kong Exchange, and technical indicators used in the study were moving average, relative strength indicators and money flow index (Li et al. 2020). Next, news articles were collected from FINET news during the same time frame as the stock data and analysed using specific sentiment dictionaries (Li et al. 2020). Utilising a long short-term memory network deep learning model, the study found that models formulating both technical analysis data and news article sentiments as prediction factors produce better prediction results than those that only include one of the factors (Li et al. 2020). Therefore, following the study, this research investigates GoTo news sentiment on portal news and how it relates to GoTo stock daily price movements.

Another study focusing on stock price movement and news sentiment was conducted by Lin et al. (2022) by using different deep learning models and news platforms to develop stock prediction formulas. Firstly, they collected stock price data from Yahoo Finance and news articles from Reuters, CNBC and The Motley Fool platforms that often publish news related to the stock market (cf. Lin et al. 2022). Next, the stock data and news sentiment were included in the prediction factors in the models built (cf. Lin et al. 2022). The study concluded that different news platforms and deep learning models could result in different stock price predictions (cf. Lin et al. 2022). Following the study's conclusion, this current research uses many news platforms to determine the sentiment and investigate its relationship to GoTo stock daily price movements.

A study by Huang et al. (2022) also discovered other relations between stock prices and news sentiment. In addition to stock price data and news sentiment, they included unpublished future events only known to insiders of related parties or communities as another factor for stock prediction models. This study determined future events as news published within seven days after a specific price date. Huang et al. (2022) found that stock prediction models that include future events as one of the prediction factors are more accurate than the ones without. However, in contrast to the study's discoveries, this research investigates the relationship between

news sentiment and the GoTo stock daily price movement only on the same trading day. Moreover, this research does not plan to make any prediction model. Therefore, the researcher decided not to include future events in the data.

Furthermore, a previous study conducted by Ballinari et al. (2022) finds a relationship between investors' attention to the news and the volatility of stock prices. They measured investors' attention by counting the number of social media posts related to specific news topics. The study discovered that price volatility increases when retail investors show greater attention to certain news. Moreover, the volatility continues up to four trading days after the post's publication (cf. Ballinari et al. 2022). However, unlike retail investors, institutional investors' attention to the news results in faster price adjustment, reducing volatility (cf. Ballinari et al. 2022). Based on the study's findings, this research categorizes the news topics to find complete data references before analysing the relationship between the news sentiment and GoTo daily price movement.

Finally, based on the previous studies, this research addresses several gaps regarding the relationship between news sentiment and stock market prices. Firstly, this research summarises and uses several effective indicators for each previous study. Those indicators are news sentiment, platforms and topics. However, this research does not consider future events or insider news as an indicator, as this research is only investigating the daily price returns that can be used for short-term trading reference and does not develop any prediction model. Next, this research focuses only on the news sentiment related to GoTo from Indonesian news portals. Moreover, this research focuses specifically on GoTo daily stock prices and excludes other stock prices in the Indonesian Stock Exchange.

3. Methods

This study uses sentiment analysis, simple linear regression statistics analysis, and descriptive statistics analysis methods using Netlytic and Microsoft Excel as analysis tools. It has four main steps: data collection, sentiment analysis, simple linear regression analysis and descriptive statistics analysis. The steps will be explained in the following parts of this methods section.

3.1 Data collection

The data collection was conducted from 12 April to 30 September 2022 in several different steps. Firstly, GoTo stock price historical data with a daily time frame filter was collected from Investing.com. The dataset collected consists of opening and closing daily prices, daily price changes and daily trading volume. The next step was manually collecting articles related to

GoTo from credible national news portals. The latter were chosen based on their performance on Google’s Search Engine Result Page. Google was used in this research because Google search volume has correlations with stock market returns (Ekinici & Bulut 2021). Next, the researcher collected news articles that appeared in the daily top ten search results with “berita GoTo” (GoTo news) as the keyword. As a result, the researcher found 55 days with news related to GoTo. Only one article per day that published complete information on the chosen topic was selected to be analysed. Thus, 55 articles were collected and ready to be analysed.

3.2 Sentiment analysis

Regarding sentiment analysis, Netlytic was used to identify and categorize sentiment for each news article. Firstly, certain words and phrases that reflect financial market sentiment were manually collected and categorized into positive and negative sentiment datasets. Secondly, the dataset was uploaded to Netytic’s sentiment dictionaries for text analysis. The next step was to analyse each news article and capture the sentiment categorization result as Netlytic displayed the number of words and phrases for both negative and positive sentiment in an article. A method from Das et al. (2021) for their research on online news sentiment was applied to this study to define the sentiment score of each news article. To simplify the method calculation, the sentiment score of each news article was determined using this formula:

$$\text{Sentiment score} = \text{the number of positive sentiments} - \text{the number of negative sentiments}$$

If the sentiment score was positive, the news was categorized as positive sentiment. Conversely, if the sentiment score was negative, the news was categorized as negative sentiment. Finally, if the sentiment score was zero, the news was categorized as neutral sentiment.

3.3 Simple linear regression statistics analysis

Simple linear regression analysis was conducted using Microsoft Excel to find correlations between news sentiment and GoTo stock daily price movement. As mentioned previously, 55 days with one article per day were collected. Initially, the researcher counts the sentiment score for each article and collects GoTo’s daily price returns from Investing.com. Next, the sentiment scores of 55 articles and daily price returns of 55 days were compiled into variables in datasets. Finally, the researcher uses simple linear regression data analysis in Microsoft Excel to analyse the relationship between those variables.

3.4 Descriptive statistics analysis

Furthermore, Microsoft Excel is used to conduct descriptive statistics analysis to find supporting data for the analysis. The data will be used to find valuable insights, such as the frequency, mean, percentages and other analyses.

4. Results and Discussion

After data observation, 55 days were selected with relevant news topics related to GoTo. In addition, as shown in Table 1, each day's sentiment score and price change were collected to be analysed. The result of the linear regression statistics analysis using Microsoft Excel can be seen in Tables 2 and 3.

This analysis used the sentiment score as the independent variable (X) and price change as the dependent variable (Y). The value of the significant level (α) used in the analysis is 5 %. The analysis data result showed that the value of Multiple R was 0.410558315, and the P-value was 0.00184968. Because the P-value was lower than the significant level ($\alpha = 0.05$) and the Multiple R value was between 0.2 and 0.4, it can be concluded that there was a moderate positive correlation between both variables.

Furthermore, the equation for simple linear regression could be constructed from the analysis data. The formula used is $Y = a + b(X)$, where a is the intercept value, and b is the independent variable regression coefficient value. Hence, the equation model is price change = $-0.780728538 + 0.204364833$ (sentiment score). However, the analysis data result showed that the value of R Square was 0.16855813, which indicates that only 16.85 % of price change values fitted the equation model. Therefore, the equation with sentiment score as the independent variable used in this analysis is not good enough to use as a prediction model for GoTo stock daily price changes.

These findings are consistent with the previous studies; stock prediction models that include more indicators, such as news sentiment and technical analysis, will create better prediction results than the ones that only used news sentiment as the single independent indicator (Lin et al. 2022). Furthermore, apart from news sentiment, other prediction factors should be added to the model, such as future events that have proven more effective in predicting stock price movements (Huang et al. 2022). Moreover, the number of news articles could affect the prediction results (Al-Maadid et al. 2022). Therefore, larger quantities of news articles could be used to get more accurate prediction results. Another study also found that time delay should be used as an indicator, as it will take time for investors to react to the news (Peng et al. 2022). Hence, more extended time frames could be used to predict GoTo stock price movement

instead of daily time frames. Even though the objective this research is not to develop prediction models, these findings support the suggestion that GoTo’s investors should not rely only on news sentiment as their investment reference.

No	Date	Sentiment Score	Price Changes (%)	No	Date	Sentiment Score	Price Changes (%)
1	30/09/22	16	-1.6	29	11/07/22	12	-3.43
2	29/09/22	-5	-3.1	30	28/06/22	3	-0.51
3	27/09/22	8	-1.56	31	22/06/22	7	0.53
4	26/09/22	11	-3.03	32	16/06/22	3	-2.97
5	23/09/22	0	0	33	15/06/22	-1	1
6	22/09/22	-6	0	34	14/06/22	5	3.09
7	21/09/22	22	-0.75	35	10/06/22	23	0.52
8	20/09/22	15	9.92	36	07/06/22	18	10.3
9	15/09/22	11	-2.21	37	06/06/22	17	-6.78
10	12/09/22	7	-1.42	38	03/06/22	9	2.91
11	05/09/22	-3	-0.7	39	02/06/22	7	13.16
12	02/09/22	4	-2.07	40	31/05/22	-5	-3.18
13	31/08/22	-2	-6.79	41	30/05/22	-36	0.64
14	30/08/22	19	1.25	42	23/05/22	-1	-2.63
15	29/08/22	0	0.63	43	20/05/22	10	8.57
16	25/08/22	7	-0.61	44	19/05/22	16	12.9
17	23/08/22	9	1.88	45	18/05/22	37	24
18	16/08/22	3	10.2	46	13/05/22	-9	-6.73
19	15/08/22	-5	0.68	47	09/05/22	-10	-6.62
20	12/08/22	4	1.35	48	27/04/22	-18	-6.45
21	11/08/22	21	5.71	49	25/04/22	17	-3.53
22	09/08/22	23	-0.71	50	22/04/22	3	0
23	05/08/22	18	0	51	19/04/22	8	-5.29
24	04/08/22	5	0	52	18/04/22	3	0.53
25	03/08/22	5	3.5	53	14/04/22	10	0.53
26	25/07/22	11	-2.6	54	13/04/22	5	1.08
27	15/07/22	6	-3.61	55	12/04/22	9	-3.14
28	13/07/22	16	-1.82				

Table 1: GoTo stock price changes and news article sentiment scores (the data was collected and compiled by the researcher)

Regression Statistics	
Multiple R	0.410558315
R Square	0.16855813
Adjusted R Square	0.152870548
Standard Error	5.202587918
Observations	55

Table 2: Regression statistics data processed with Microsoft Excel (the data was collected and compiled by the researcher)

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	290.825537	290.825537	10.7446849	0.00184968
Residual	53	1434.54682	27.066921		
Total	54	1725.37235			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0.780728538	0.81271985	-0.9606367	0.3410971	-2.4108381	0.84938105	-2.4108381	0.84938105
Sentiment Score	0.204364833	0.0623461	3.27790861	0.00184968	0.07931438	0.32941528	0.07931438	0.32941528

Table 3; ANOVA table processed with Microsoft Excel (the data was collected and compiled by the researcher)

Several data results from descriptive statistics analysis also provide valuable insights for this study. There are 55 data with 41 positive sentiment news, 12 negative sentiment news and 2 neutral sentiment news. As shown in Table 4, there are 18 days with the highest percentage of positive price changes, and those days also have positive sentiment scores. The news topics with the highest percentage of positive price changes are GoTo’s increased transactions, stock performances, prospect analysis, collaboration with other companies, and strategies to increase revenue. Therefore, GoTo’s investors could anticipate the possibility of a high percentage of positive price changes if those topics are published on news portals. The findings align with the study from Ballinari et al. (2022), which discovered interesting news topics for investors that could result in a higher volatility in the market. Those news topics are revenues, earnings, acquisitions, mergers and analyst reports (cf. Ballinari et al. 2022).

No.	Date	Sentiment score	Price change (%)	News topic
1	18/05/22	37	24.00	Increased transactions
2	02/06/22	7	13.16	Stock performances
3	19/05/22	16	12.90	Increased transactions
4	07/06/22	18	10.30	Increased transactions
5	16/08/22	3	10.20	GoTo prospect analysis
6	20/09/22	15	9.92	Collaborations with other companies
7	20/05/22	10	8.57	Stock performances
8	11/08/22	21	5.71	Collaborations with other companies
9	03/08/22	5	3.50	Strategies to increase revenue
10	14/06/22	5	3.09	Stock investment from other companies
11	03/06/22	9	2.91	Stock performances
12	23/08/22	9	1.88	Programs launched
13	30/08/22	19	1.25	Increased revenue
14	13/04/22	5	1.08	GoTo's influences on other technology startups
15	22/06/22	7	0.53	Programs launched
16	18/04/22	3	0.53	Stock performances
17	14/04/22	10	0.53	Environmentally friendly programs
18	10/06/22	23	0.52	Strategies to increase revenue

Table 4: News topics with positive score sentiments and price changes (the data was collected and compiled by the researcher)

No	Date	Sentiment score	Price change (%)	News topic
1	31/08/22	-2	-6.79	GoTo recorded losses
2	13/05/22	-9	-6.73	Inflation data
3	09/05/22	-10	-6.62	Stock performances
4	27/04/22	-18	-6.45	Stock performances
5	31/05/22	-5	-3.18	GoTo recorded losses
6	29/09/22	-5	-3.10	The effect of global recession on stocks
7	23/05/22	-1	-2.63	Internal stakeholders
8	05/09/22	-3	-0.70	Rise in fuel prices

Table 5: News topics with negative score sentiments and price changes (the data was collected and compiled by the researcher)

Furthermore, as shown in Table 5, there are also eight days with the highest percentage of negative price changes, and those days also have negative sentiment scores. This study listed news topics published on those days: GoTo’s losses, global inflation data, stock performances, global recession, a rise in fuel prices and news about internal stakeholders. Hence, GoTo’s investors could be aware of the possibility of a high percentage of negative price changes if those

topics are published on news portals. These findings are also consistent with the study by Al-Maadid et al. (2022), which stated that different types of news would result in different effects on the stock market.

Moreover, 18 days have positive sentiment scores and positive price changes, 10 days more than the days with negative news sentiment scores and negative price changes. However, the data also means that only 43 % of 41 days have positive sentiment news and price changes. In addition, 10 days with negative sentiment scores and negative price changes also show that there are 66 % of 12 days with negative sentiment news and price changes. These findings are consistent with the research by Baek and Lee (2021) on the US stock market, which concluded that bad news has a significant effect on the stock market, specifically on the volatility and price movement, while good news has a minor effect. They also stated that bad news could give significant prediction results on stock market volatility (cf. Baek & Lee 2021). Thus, GoTo’s investors should be more vigilant when bad news with negative sentiments is published on news portals, as negative sentiment news affects price changes substantially.

It could be seen by looking at the news topics that they not only consisted of themes with direct relations with GoTo but also about the general financial market. These findings follow the study by Guo et al. (2022) that discovered strong influences of the federal funds rate on stock market reactions during certain phases of investor sentiment. Furthermore, there are news topics related to crises, such as rise in the fuel price and global recession. These discoveries align with the Chinese stock market research by Duan et al. (2021), which concluded that a crisis such as the COVID-19 pandemic creates sentiments positively correlated with the stock market and could be used as a variable to predict stock price movements. Thus, investors should also pay attention to non-fundamental news to anticipate GoTo stock price changes because, as stated by Ftiti et al. (2021), non-fundamental news also influences stock market prices.

5. Conclusion

Based on this study, it could be concluded that there is a moderate positive correlation between news portal sentiment and GoTo stock daily price movement. However, news portal sentiment could not be used as a sole indicator to predict GoTo stock daily price movement. Furthermore, this study also finds specific fundamental news topics with positive sentiments that are also followed by the highest percentage of positive price changes, such as GoTo’s increased transactions, stocks performances, prospect analysis, collaboration with other companies and strategies to increase revenue. However, investors should also pay attention to specific fundamental news topics with negative sentiments, such as GoTo’s losses and stock performances, as those

topics could result in a high percentage of negative price changes. Moreover, investors should be vigilant with non-fundamental news, such as global recession and inflation data, as that kind of news topic could also generally affect GoTo's stock prices and stock markets significantly. Future research should include other indicators, such as upcoming events, technical analysis and time delay. Additionally, more extended time frames, more significant numbers of news articles and different types of news topics should be used to get more accurate results.

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Short biography of the author



Lady Joanne Tjahyana, S.Kom., MMM., is a lecturer and researcher at the Communication Department, Petra Christian University, Surabaya, Indonesia. She earned her master’s degree in multimedia design from Monash University Australia. She is specialized in interactive digital media development, such as website, mobile application, virtual reality, augmented reality and metaverse. Also, she conducts research on virtual community using netnography and sentiment analysis method. In addition, she is a trainer on several professional development programs hosted by Petra Christian University, such as media monitoring tools and search engine optimization workshops. Her interest in cryptocurrency and stock market results in several studies on the relations between news, sentiment, virtual community and price movement.

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