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Impact of News Related to Covid-19 on Stock Market Returns in Five Major ASEAN Countries

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Abstract

The sudden tightening of global finances, unprecedented and dominating news of how negative COVID-19 is has affected the global monetary, and how pessimistic the public sentiment towards the COVID-19 virus pandemic is itself has caused uncertainty in the stock market. The purpose of this study is to analyze the relationship between COVID-19-related news and stock market returns. RavenPack Coronavirus Media Monitor was used to explain important news issues related to COVID-19 with news indices such as panic, media hype, fake news, country sentiment, infodemic, and media coverage. With the quantile regression analysis technique, the results of the study were divided into three research periods. For the research period of January 2020 to March 2020, it was found that the variables that affect stock market returns are media hype, fake news, country sentiment and infodemic index; for the research period of April 2020 to December 2020, it was found that the variables that affect stock market returns are panic, fake news and country sentiment index; while for the period January 2020 to December 2020 the variables that affect stock market returns are panic, fake news, country sentiment and infodemic index.

Keywords: COVID-19, News, Stock Market Return

1. Introduction

The Health Commission of the City of Wuhan, Hubei Province, China, reported several cases of pneumonia on December 31, 2019, where the virus with the code COVID-19 was identified. On March 11, 2020, WHO finally declared that the COVID-19 outbreak was a Public Health Emergency of International Concern (PHEIC) (World Health Organization., 2020).

The number of confirmed cases in Southeast Asia began to increase in mid-March 2020. More than 15,532 confirmed cases and more than 529 deaths were reported in April 2020. As cases continue to increase worldwide, the risk of a sudden tightening of global financial conditions increases. The impact of the pandemic brings immediate disruption in all sectors of economic activity. This is because the movement restrictions imposed through lockdowns, quarantines, temporary business closures and school closures cause the company's business activities to be significantly affected due to limitations in the supply chain, product distribution, trade and investment. Jobs and livelihoods are threatened, while consumer confidence decline.

Uncertainty emerged in Southeast Asian countries caused by the COVID-19 pandemic which triggered heavy capital outflows, leading to market declines and rapid exchange rate depreciation. Many countries do not anticipate the continued impact of COVID-19 on the economy and tend to underestimate it. The Asian Development Bank explained the magnitude of the impact seen from the forecast made last year before the outbreak with the current figures during the COVID-19 pandemic, it appears that the projected growth for ASEAN which was previously 4.4% in 2019, has changed to 1.0% in 2020 (ASEAN Policy Brief, 2020).

Countries in Southeast Asia have revised their projections for a decline in economic growth due to the impact of the COVID-19 pandemic. Indonesia is projecting to grow by 5.3 percent in 2020, the growth forecast changes to -0.4-2.3% on April 1, 2020. Likewise, the Philippines' official economic growth target, which was originally 6.5-7.5% for 2020, was lowered to -0.6-4.3% in March 2020. Thailand has also revised its economic growth forecast due to the slump in the tourism sector. Thailand, with economic growth in 2020 which was previously estimated at 2.7-3.7%, decreased its projection to 1.5-2.5%. Singapore itself through the Ministry of Trade and Industry changed Singapore's growth projection from 0.5-2.5% to -0.5-1.5%. Malaysia, which has an official economic growth target of 4.8%, changed its growth projection to -2.0-0.5% on April 3, 2020.

In early January 2020, the trend of short-lived upbeat in stock markets around the world quickly occurred, followed by a decline towards the end of March 2020 caused by the panic over the COVID-19 (ASEAN Policy Brief, 2020). 2020 Stock Market Crash, where major stock market indexes fell by 20-30% globally at the end of February and March. The recovery from the 2020 Stock Market Crash began in early April 2020 (Samuelson, 2020; Williams, 2020), and many stock market indices recovered or even set new records by the end of 2020. The impact of the 2020 Stock Market Crash in 2020 was felt in the Southeast Asia region. After World Health Organization declared COVID-19 as a global pandemic on March 11, 2020, uncertainty emerged that caused a rapid decline in stock markets throughout the Southeast Asian region. About a quarter of the market value of stocks in Indonesia, Philippines, and Thailand fell (ASEAN Policy Brief, 2020). Jakarta Composite Index fell 5,01% on March 12, 2020; Kuala Lumpur Composite Index decreased 5,26% on March 13, 2020; Strait Times Index lost 6,30% on March 13, 2020; Stock Exchange of Thailand decrease 10,80% on March 12, 2020; and the Philippine Stock Exchange fell 9,71% on March 12, 2020.

From the very beginning of securities trading, the relevant information or news has been widely read and processed by humans. Computer algorithms that are used to process data to make it simpler and easier to understand are increasingly being used to read and interpret information and news over the last two decades.

The number of articles related to the COVID-19 virus is increasing after the outbreak of COVID-19. This study uses RavenPack Coronavirus Media Monitor from RavenPack to summarize the emotions or sentiments of millions of articles, both news and information from public posts related to COVID-19 into simple indicators.

This paper examines the stock market reaction to news related to COVID-19 using quantile regression. It is similar to the researches of Cepoi (2020). He uses the panel quantile regression model and the result show there is an asymmetric dependence between the stock market and information related to COVID-19 such as fake news, media coverage, and contagion.

Research on stock price reactions to other infectious diseases has been carried out, such as SARS, H1N1 Influenza, Ebola, and Zika. Chen, Jang, & Kim (2007) using an event study approach revealed that hotel stocks in Taiwan showed a significant effect on the cumulative average of abnormal returns during and after the day of the SARS outbreak.

Several previous studies that have focused on understanding whether economic and political news can drive the stock market during the COVID-19 pandemic have been carried out. Haroon & Rizvi (2020) in their research showed that news contributed to the panic over the COVID-19 virus, which contributed more to stock volatility, especially in sectors that were considered the most affected by the COVID-19 pandemic. However, media coverage and sentiment have a small to moderate impact on stock volatility. Wu & Lin (2017) state that the attitude

of investors is not only influenced by how much quantity of the news, but also how good the quality of the available news is. Different types of investors have their response to the style or pattern of each media coverage.

The purpose of this study is to examine the impact of news related to COVID-19 on stock market returns in major ASEAN countries, namely Indonesia, Singapore, Malaysia, the Philippines, and Thailand. News variables related to COVID-19 obtained from RavenPack Coronavirus Media Monitor include the Panic Index, Media Hype Index, Fake News Index, Country Sentiment Index, Infodemic Index, and Media Coverage Index. The entire period of study is divided into three phases: Phase I (January 2020 to March 2020) was when the trend of short-lived upbeat in stock markets around the world occurred, followed by a decline towards the end of February and March (2020 Stock Market Crash); Phase II (April 2020 to December 2020) is when the recovery from the 2020 Stock Market Crash began in early April 2020 and many stock market indices recovered or even set new records by the end of 2020; and Phase III (January 2020 to December 2020) for the whole of 2020.

2. Literature Review

According to Fama (1970) efficient market hypothesis, prediction of stock returns should not be possible, this is because the price in the market will reflect all available information. Several financial researchers like Johnson & Tversky (1983) have shown empirical evidence that the stock market is driven by the psychology of investors. An investor when making risky decisions will depend on their mood (Johnson & Tversky, 1983). Keynes, (1936) proposed that the market was influenced by the investor's "animal spirit" which caused prices to deviate from fundamentals. The importance of this spirit is attached to the confidence factor in determining the level of investment, as well as aggregate demand. This idea was formalized by De Long et al. (1990), which theoretically shows that changes in sentiment can lead to trading noise and excessive volatility.

The current COVID-19 pandemic can affect human sentiment or psychology, where the level of "anxiety" about the pandemic which includes human reactions to the media, be it reactions to real or fake information causes excessive panic attacks. This also applies to investors where this outbreak can change sentiment about stock prices, as evidenced by the decline in stock values in several countries (Naseem et al., 2021).

Several studies have shown evidence of dynamics in the stock market caused by the COVID-19. Ashraf (2020) in his research shows that stock market returns have a negative relationship to the number of confirmed cases. Stock market returns are driven by the number of confirmed cases compared to the number of deaths. The market reaction is more volatile when there is an increase in confirmed cases and during the first 40-60 days of the COVID-19 pandemic. Liu et al., (2020) pointed out that stock markets in major COVID-19-affected countries experienced rapid decline following the virus outbreak. Countries in the Asian region experience more negative abnormal returns than other countries.

The use of computers and intelligence in processing data from sources derived from information such as social media and news has increased in recent years and has become a viable trading strategy to use. The earlier studies conducted by Smales (2014) which aims to determine the market reaction of stocks to stock-specific news shows that the number of available news items reveals different responses to market activity, volatility, bid-ask spreads, and return; The relevance of news items is very important when identifying significant effects; and reactions to volatility, market activity, and spreads are most affected by negative news. von Beschwitz et al. (2018) adds that the news release algorithm by computer can speed up the response of trading volume and stock prices. News analysis using computer algorithms can increase market efficiency because temporary price distortions due to inaccurate news analysis can be corrected quickly. Broadstock & Zhang (2019) examines the sentiment obtained from social media (Twitter), whether it can move stock returns or not. Stock price changes are vulnerable to social media sentiment factors. This change was driven by the company and the financial market sentiment. In explaining the impact of public news sentiment on stock return volatility at the company level, Shi & Ho (2020) used the RavenPack Dow Jones News Analytics database in compiling news variables, where the results of the study indicate that macroeconomic sentiment and company-specific news affect the volatility of intraday stock returns.

Some literature shows a link between stock returns and news related to the COVID-19. Salisu & Vo (2020) evaluates the relevance of health news trends in predicting stock returns in the 20 countries worst hit by COVID-19. Health news trends are derived from Google Trends search volume data. The results show that "health news" has a significant and negative effect on stock returns, which means that stock returns will decrease when the volume of searches for health issues since the COVID-19 outbreak has increased. Cepoi (2020) investigates the impact that news related to COVID-19 has had on stock market returns. Data for news comes from RavenPack and gold prices as a benchmark for global general factors. The results show that fake news, media coverage, and contagion have negative effect on stock market returns. Meanwhile, Haroon & Rizvi (2020) show that panic-laden news can increase volatility in the stock market and industries affected by the pandemic. However, sentiment index and media coverage have a small to moderate effect on volatility in the stock market.

This study uses six news variables related to COVID-19 obtained from the RavenPack Coronavirus Media Monitor, including the Panic Index, Media Hype Index, Fake News Index, Country Sentiment Index and Media Coverage Index.

Return

According to Bringham & Houston (2001), *return* is "measure the financial performance of an investmen.". The return is very sensitive to domestic political turmoil, economic crises, natural disasters such as earthquakes, hurricanes, floods, international oil prices, the influence of inflation, changes in policies, norms, government regulations and so on (Narayan, 2016).

There is a formula for calculating stock index returns. The following is the formula for calculating the percentage change in price during the one-day *holding period* (Ross et al., 2008):

$$R_i = \frac{P_t - P(t-1)}{P(t-1)}$$

Description:

R_i : Stock returns (*return*)

P_t : market index value on day t

P_{t-1} : market index value on previous day t

RavenPack Coronavirus Media Monitor

RavenPack Coronavirus Media Monitor is a summary of the emotions (sentiments) of news articles and public posts that are processed into simpler indicators. Custom indexes were created by RavenPack data experts to provide users with additional insightful information and early warning about news changes around the COVID-19 virus. (RavenPack, 2020).

First, the panic index. This index calculates the chatter rate of news that references COVID-19- related panic or hysteria. The index ranges between 0 and 100, where the higher the score on the index, the higher the number of references related to panic found in the media.

Second, media hype index. The media hype index quantifies the percentage of the latest news that talks about the COVID-19 virus. An index is in the range 0 and 100. The value indicates the percentage of all news stories that talk about COVID-19.

Third, the Fake news index. The fake news index calculates the chatter rate in the media about the COVID-19 virus whose references lead to fake news or false information related to COVID-19. The index ranges between 0 and 100 where the result is the percentage of all stories that convey fake news and COVID-19.

Fourth, country sentiment index. The sentiment index aims to measure the level of sentiment that exists across all entities mentioned in the news together with the COVID-19 virus. The index ranges between -100 and 100. A

negative value leads to a negative sentiment while a positive value leads to positive sentiment. Zero value means neutral.

Fifth, infodemic index, Infodemic index quantifies the percentage of all related entities such as places, companies, organizations, etc that are associated and reported in the media together with the COVID-19 virus. The index ranges between 0 and 100, which means the number of percentages of all news that is co-mentioned with COVID-19.

And Sixth, media coverage index. The media coverage index calculates the percentage of all news sources providing information on the topic of the COVID-19 virus. The index ranges between 0 and 100 where the result is a percentage of the total number of available news samples covering stories about COVID-19.

3. Research Method

This research is quantitative. The data used by secondary data. The stock market return is the dependent variable consisting of daily stock market return in Indonesia (*IDX*), Malaysia (*KLCI*), Philippines (*PSEi*), Singapore (*SGX*), and Thailand (*SET*). News related to COVID-19 as an independent variable, consisting of the Panic Index, Media Hype Index, Fake News Index, Country Sentiment Index and Media Coverage Index were obtained from RavenPack Coronavirus Media Monitor. Panel data is used to cover 5 working days of the stock exchange during 2020. The entire period of study is divided into three phases: Phase I, January 2020 to March 2020; Phase II, April 2020 to December 2020; and Phase III, January 2020 to December 2020.

Due to excessive stock market volatility during the financial turmoil caused by COVID-19, quantile regression was used to process data. This is because quantile regression is very useful if the data is not homogeneous where the Y variance will change with changes in X and when the data is not symmetrical, there is a tail in the distribution or a truncated distribution (Koenker, 2005). The use of the quantile regression method makes it possible to understand the relationship between variables outside the mean. Quantile regression can handle data that is not symmetrical, there are tails in the distribution or the distribution is truncated.

In this study, data processing will be assisted by the IBM SPSS Statistics 26.0 program, with the probability value used is $\alpha = 0.05$ (5%).

At this stage, a statistical model will be compiled for the data: Stock Market Return (Y), Panic Index (X1), Media Hype Index (X2), Fake News Index (X3), Country Sentiment Index (X4), Infodemic Index (X5), and Media Coverage Index (X6) into a Quantile Regression Model, with the following equation:

$$Q_r(Y|X) = \beta_0(\tau) + \beta_1(\tau)X_1 + \beta_2(\tau)X_2 + \beta_3(\tau)X_3 + \beta_4(\tau)X_4 + \beta_5(\tau)X_5 + \beta_6(\tau)X_6$$

Where:

$Q_r(Y|X)$: The- τ^{th} quantile function of the variable Y with the condition X

τ : Index quantile with $\tau \in (0,1)$

$\beta_i(\tau)$: The- i regression coefficient on the- τ^{th} quantile, with $i = 0,1,2,3$

4. Result

Appendix A, B, and C present empirical results of quantile regression which are divided into three research periods, consisting of p-value coefficients and t-test. According to the estimation results of quantile regression analysis on the 5th, 10th, 15th, 20th, 25th, 30th, 35th, 40th, 45th, 50th, 55th, 60th, 65th, 70th, 75th, 80th, 85th, 90th, and 95th quantiles.

Phase I: January 2020 to March 2020

In Appendix A it can be seen that the results of the quantile regression test show that of the six variables, four variables have a significant effect on stock market returns in five ASEAN countries, namely, Indonesia, Malaysia,

Singapore, Philippines, and Thailand in the study period January 2020 to March 2020. Media hype index, fake news index, country sentiment index, and infodemic index gained a significance value less than 0.05.

The media hype index has a positive effect on stock market returns in the 80th and 85th quantiles. Meanwhile, in the 10th quantile, the media hype index has a negative effect on stock market returns. When stock market returns are falling, the media hype index will rise and vice versa (10th quantile). This condition can occur when the stock market is in a condition of experiencing an extreme downward trend in stock values throughout the world from January to the end of March 2020. Meanwhile, when the stock market is in an uptrend or bullish condition (80th and 85th quantiles), the media hype index will increase in line with the increase in stock market returns.

The fake news index has a positive effect on the 15th, 25th, 30th, 40th, 45th, 65th, 80th and 85th quantiles. Stock market returns were driven by fake news during January 2020 to March 2020 and occurred in almost all market conditions.

The significant and negative relationship between the country sentiment index and stock market returns occurred in the upper quantiles (75th, 80th, and 85th quantiles). This indicates that the higher the sentiment associated with the COVID-19 news, the lower the expected stock market returns.

Infodemic index is affecting stock market return at the time of extreme bullish market (95th quantile). The higher the number of news about entities reported by the media mentioned together with COVID-19, the higher the stock market returns in the five ASEAN countries.

Phase II: April 2020 to December 2020

In the recovery period after the 2020 Stock Market Crash which began in early April 2020 until the end of 2020, it can be seen from Appendix B, the results of the quantile regression test show that of the six variables, three variables have a significant effect on stock market returns in five ASEAN countries. The Panic Index, Fake News Index, and Country Sentiment Index have a significance value of less than 0.05.

The level of news that refers to the COVID-19 panic has a significant and positive effect on stock market returns in the five ASEAN countries. The higher the panic index value, the higher the stock market returns in the five ASEAN countries. In particular, the panic index has a positive effect on the upper quantiles, namely the 80th, 85th, and 95th quantiles. The effect of the panic index on stock market returns occurs when the stock market is in an uptrend or strengthening (bullish condition).

The fake news index has a significant and positive effect on the upper quantile (95th quantile). This shows that the higher the level of media chatter about COVID-19 that refers to misinformation or fake news, the higher the stock market returns.

The negative relationship between the country sentiment index and stock market returns only occurred in the 75th quantile. When the value of the country sentiment index increases, the stock market returns will decrease by the coefficient value (Appendix B).

Phase III: January 2020 to December 2020

It can be seen from Appendix C, the results of the quantile regression test of six variables, four news variables related to COVID-19 affect stock market returns in the five ASEAN countries in the research period January 2020 to December 2020. The Panic Index, Fake News Index, Country Sentiment Index and Infodemic Index have a significance value of less than 0.05.

The panic index negatively affects stock market returns during bearish markets (5th, 10th, 15th, and 20th quantiles) and positively affects stock market returns during bullish markets (85th, and 95th quantiles). The panic index will increase when stock market returns decline. This condition occurs when the market is in a bearish condition (5th,

10th, 15th, and 20th quantiles). Meanwhile, when the stock market is in bullish condition (85th, and 95th quantiles), the panic index will increase in line with the increase in stock market returns.

The fake news index has a significant and positive effect on the 90th and 95th quantiles. The fake news index will increase along with the increase in stock market returns when the market is experiencing extreme bearish conditions (90th and 95th quantiles).

The country sentiment index has a positive impact from the lower quantile (10th and 15th quantile). While the negative impact occurred in the upper quantile (the 70th and 75th quantiles). The market reacts positively when it is in a bearish condition. The increase in the country sentiment index will be in line with stock market returns. On the other hand, when the market is in a bullish condition, the increase in the country sentiment index will not be in line with or against stock market returns.

The Infodemic index does not affect stock market returns when the market is in a bearish or bullish condition and seems to positively influence stock dynamics during a period that leads to a decline (around the 40th quantile).

5. Discussion

The test results in this study indicate that the effect of the panic index on stock market returns in the five ASEAN countries occurs in 2 phases of the research period, namely Phase II (April 2020 to December 2020) and Phase III (January 2020 to December 2020). Haroon & Rizvi (2020), also revealed in their research results that the panic-laden news generated by the media was related to increased volatility in financial markets around the world during the COVID-19 outbreak, especially for the industries that are most vulnerable due to events that occurred during the pandemic.

The media hype index affected stock market returns during Phase I (January 2020 to March 2020), when the trend of short-lived upbeat in stock markets around the world occurred, followed by a decline towards the end of February and March. The results of testing with quantile regression in this study are in line with the results of research conducted by Zaremba et al. (2020), which revealed in their research results that the action applied chronologically especially at the beginning of information dissemination and restrictions on public activities were the main contributors to the growth in volatility when the COVID-19 outbreak occurred.

The fake news index affects stock market returns in the three research periods. During Phase I (January 2020 to March 2020) fake news contributed positively to almost all market conditions. Several previous studies have stated that fake news has implications for stock trading, and shows that there is an increasing importance of fake news on financial markets and its implications for stock trading (Allcott & Gentzkow, 2017; Zhang & Ghorbani, 2020). The results of research conducted by Cepoi (2020), also illustrate how the fake news index affects stock market returns in several global stock markets during the global COVID-19 event. The results of his research show that the stock market presents an asymmetric dependence with information related to COVID-19, one of which is fake news.

Another variable that influences stock market returns is Country Sentiment. Country sentiment variable affects stock market return in the three research periods. The country sentiment index has a negative effect on stock market returns in the upper quintiles. Except for the research period January 2020 to December 2020, the country sentiment index has a positive impact on the lower quantile. This fact can be proven from a previous study conducted by Chundakkadan & Nedumparambil (2021), which found evidence that attention to the COVID-19 virus created a general negative sentiment among market participants and resulted in pressure on the stock market. The effect became even higher when WHO (World Health Organization) declared COVID-19 as a global pandemic. Chundakkadan & Nedumparambil (2021) also found that sentiment over the COVID-19 pandemic resulted in excessive volatility in the market.

The infodemic index has a positive impact on the middle to upper quantiles. These impacts occurred in Phase I (January 2020 to March 2020) and Phase II (January 2020 to December 2020). The test results in this study are in

line with the results of research conducted by Liu et al. (2020), where research results show that stock markets in the main affected countries and regions fell rapidly after the virus outbreak occurred. Countries in Asia experienced more negative abnormal returns than other countries. The adverse effect of confirmed cases of COVID-19 on stock index abnormal returns added to investor pessimism.

The test results in this study indicate that there is no significant effect between the media coverage index on stock market returns in ASEAN-5 countries. The media coverage index which is a percentage of total news with topics related to COVID-19 does not affect stock market returns in all quantile areas and throughout the study period. Research conducted by Haroon & Rizvi (2020), found that media coverage has a relationship with price volatility, but the relationship is small. Wu & Lin (2017) state that the attitude of investors is not only influenced by how much quantity of the news, but also how good the quality of the available news is. Different types of investors have their response to the style or pattern of each media coverage. In addition, one of the determinants of decision making is the calculation of the influence on the company's risk, and the characteristics of investors' also the personal information which cannot be observed directly.

6. Conclusion

The results of this study indicate that the effect of each variable is different depending on the period of the study. In Phase I (January 2020 to March 2020), news variables that affect stock market returns in the five ASEAN countries are the media hype index, fake news index, country sentiment index, and infodemic index. For Phase II (April 2020 to December 2020), news variables that affect stock market returns in the five ASEAN countries are panic index, fake news index and country sentiment index. Meanwhile, for the research period Phase II (January 2020 to December 2020), news variables that affect stock market returns in five ASEAN countries are panic index, fake news index, infodemic index, as well as country sentiment.

The independent variables that affect stock market returns are different from previous studies. After researching for different periods, the influencing variables also differ as the time of the research changes. Research objects such as different countries, entities, and industries allow producing different research results.

Suggestions that can be given by researchers include avoiding panic over COVID-19 so as not to take the wrong steps when making decisions on selling shares that will have an impact on losses. Be more careful in using information through the media related to COVID-19 to reduce financial turmoil.

References

- Allcott, H., & Gentzkow, M. (2017). Social Media and Fake News in the 2016 Election. *Journal of Economic Perspectives*, 31(2), 211–236.
- ASEAN Policy Brief. (2020). Economic Impact of Covid-19 Outbreak on ASEAN. In *Association of Southeast Asian Nations (ASEAN)* (Issue April). https://asean.org/storage/2020/04/ASEAN-Policy-Brief-April-2020_FINAL.pdf
- Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance*, 54(May). <https://doi.org/10.1016/j.ribaf.2020.101249>
- Bringham, E. F., & Houston, J. F. (2001). *Manajemen Keuangan*. Erlangga.
- Broadstock, D. C., & Zhang, D. (2019). Social-media and intraday stock returns: The pricing power of sentiment. *Finance Research Letters*, 30(November 2018), 116–123. <https://doi.org/10.1016/j.frl.2019.03.030>
- Cepoi, C. O. (2020). Asymmetric dependence between stock market returns and news during COVID-19 financial turmoil. *Finance Research Letters*, 36(April), 101658. <https://doi.org/10.1016/j.frl.2020.101658>
- Chen, M. H., Jang, S. C. (Shawn), & Kim, W. G. (2007). The impact of the SARS outbreak on Taiwanese hotel stock performance: An event-study approach. *International Journal of Hospitality Management*, 26(1), 200–212. <https://doi.org/10.1016/j.ijhm.2005.11.004>
- Chundakkadan, R., & Nedumparambil, E. (2021). In search of COVID-19 and stock market behavior. *Global Finance Journal*, xxx, 100639. <https://doi.org/10.1016/j.gfj.2021.100639>
- De Long, J. B., Shleifer, A., Summer, L. H., & Waldmann, R. J. (1990). Noise Trader Risk in Financial Markets. *Inefficient Markets*, 98(4), 28–52. <https://doi.org/10.1093/0198292279.003.0002>

- Fama, E. F. (1970). Session Topic: Stock Market Price Behavior Session Chairman: Burton G. Malkiel Efficient Capital Markets: A Review Of Theory And Empirical Work. *The Journal of Finance*, 25(2), 383–417.
- Haron, O., & Rizvi, S. A. R. (2020). COVID-19: Media coverage and financial markets behavior—A sectoral inquiry. *Journal of Behavioral and Experimental Finance*, 27, 100343. <https://doi.org/10.1016/j.jbef.2020.100343>
- Johnson, E. J., & Tversky, A. (1983). Affect, generalization, and the perception of risk. *Journal of Personality and Social Psychology*, 45(1), 20–31. <https://doi.org/10.1037/0022-3514.45.1.20>
- Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. Macmillan Cambridge University Press. <https://www.marxists.org/reference/subject/economics/keynes/general-theory/>
- Koenker, R. (2005). *Quantile Regression*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511754098>
- Liu, H., Manzoor, A., Wang, C., Zhang, L., & Manzoor, Z. (2020). The COVID-19 outbreak and affected countries stock markets response. *International Journal of Environmental Research and Public Health*, 17(8), 1–19. <https://doi.org/10.3390/ijerph17082800>
- Narayan, P. (2016). Literature on Stock Returns : A Content Analysis. *AJF Amity Journal of Finance*, 1(1), 194–207.
- Naseem, S., Mohsin, M., Hui, W., Liyan, G., & Penglai, K. (2021). The Investor Psychology and Stock Market Behavior During the Initial Era of COVID-19: A Study of China, Japan, and the United States. *Frontiers in Psychology*, 12(February), 1–10. <https://doi.org/10.3389/fpsyg.2021.626934>
- RavenPack. (2020). *Coronavirus Media Monitor*.
- Ross, S. A., Westerfield, R. W., & Jaffe, J. (2008). Corporate Finance. In *The Journal of Finance* (8th Editio, Vol. 12, Issue 4). McGraw- Hill. <https://doi.org/10.2307/2976227>
- Salisu, A. A., & Vo, X. V. (2020). Predicting stock returns in the presence of COVID-19 pandemic: The role of health news. *International Review of Financial Analysis*, 71(June), 101546. <https://doi.org/10.1016/j.irfa.2020.101546>
- Samuelson, R. J. (2020, March 11). *Opinion: What the Crash of 2020 means*. The Washington Post. <https://www.washingtonpost.com/opinions/2020/03/11/what-crash-2020-means/>
- Shi, Y., & Ho, K. Y. (2020). News sentiment and states of stock return volatility: Evidence from long memory and discrete choice models. *Finance Research Letters*, September 2019, 101446. <https://doi.org/10.1016/j.frl.2020.101446>
- Smales, L. A. (2014). Non-scheduled news arrival and high-frequency stock market dynamics. Evidence from the Australian Securities Exchange. *Research in International Business and Finance*, 32, 122–138. <https://doi.org/10.1016/j.ribaf.2014.03.006>
- von Beschwitz, B., Donald B., K., & Massimo, M. (2018). First to “Read” the News: News Analytics and Algorithmic Trading. *International Finance Discussion Paper*, 2018(1233), 1–65. <https://doi.org/10.17016/ifdp.2018.1233>
- Williams, S. (2020, March 10). *Stock Market Crash 2020: Everything You Need to Know*. The Motley Fool. <https://www.fool.com/investing/2020/03/10/stock-market-crash-2020-everything-you-need-to-kno.aspx>
- World Health Organization. (2020). *Archived: WHO Timeline - COVID-19*. Who. <https://www.who.int/news-room/detail/27-04-2020-who-timeline---covid-19%0Ahttps://www.who.int/news-room/detail/27-04-2020-who-timeline---covid-19?gclid=EAIaIQobChMI4MaewOeo6gIVyyMrC>
- Wu, C. H., & Lin, C. J. (2017). The impact of media coverage on investor trading behavior and stock returns. *Pacific-Basin Finance Journal*, 43, 151–172. <https://doi.org/10.1016/J.PACFIN.2017.04.001>
- Zaremba, A., Kizys, R., Aharon, D. Y., & Demir, E. (2020). Infected Markets: Novel Coronavirus, Government Interventions, and Stock Return Volatility around the Globe. *Finance Research Letters*, 35(May), 101597. <https://doi.org/10.1016/j.frl.2020.101597>
- Zhang, X., & Ghorbani, A. A. (2020). An overview of online fake news: Characterization, detection, and discussion. *Information Processing & Management*, 57(2), 102025. <https://doi.org/10.1016/J.IPM.2019.03.004>

Appendix A Quantile Regression Result for Phase I – January to March 2020

	q=0,0 5	q=0,1	q=0,1 5	q=0,2	q=0,2 5	q=0,3	q=0,3 5	q=0,4	q=0,4 5	q=0,5	q=0,5 5	q=0,6	q=0,6 5	q=0,7	q=0,7 5	q=0,8	q=0,8 5	q=0,9	q=0,9 5
(Intercept)																			
Coefficient	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,000	0,002	0,002	0,007	0,006
t	0,012	0,006	0,003	0,001	0,001	0,000	0,001	0,001	0,001	0,001	0,001	0,001	0,000	0,000	6	0	2	2	5
Sig.	0,842	0,568	0,361	0,221	0,272	0,150	0,211	0,357	0,357	0,399	0,369	0,355	0,080	0,032	0,137	0,458	0,416	0,594	0,593
	3	4	4	3	0	4	3	9	9	3	4	6	1	4	9	8	8	5	7
	0,400	0,570	0,718	0,825	0,785	0,880	0,832	0,720	0,720	0,690	0,712	0,722	0,936	0,974	0,890	0,646	0,677	0,552	0,553
	4	3	1	0	8	5	8	7	7	0	2	4	2	1	5	8	2	7	3
PI																			
Coefficient	0,000	-	-	0,000	0,000	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	-	0,000	0,000	0,001
t	0,534	-	-	0,059	0,008	-	0,961	1,086	1,264	1,359	1,199	1,450	1,242	0,536	-	-	0,374	0,636	1,964
Sig.	0,593	0,725	0,689	0,953	0,993	0,897	0,337	0,278	0,207	0,175	0,231	0,148	0,215	0,592	0,851	0,466	0,708	0,525	0,050
	6	3	1	0	0	9	4	4	1	3	5	1	4	5	5	1	3	1	5
HY																			
Coefficient	0,001	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000
t	1,941	2,163	0,930	0,995	1,296	1,275	1,030	1,850	1,891	1,819	0,964	0,834	0,506	-	0,205	0,791	2,078	1,985	1,643
Sig.	0,053	0,031	0,353	0,320	0,195	0,203	0,303	0,065	0,059	0,070	0,335	0,405	0,613	0,837	0,429	0,038	0,048	0,101	0,254
	3	5	0	3	9	3	8	4	7	0	8	0	1	3	5	7	2	4	9
FNI																			
Coefficient	0,005	0,004	0,003	0,002	0,002	0,002	0,001	0,001	0,001	0,001	0,000	0,000	0,001	0,001	0,001	0,002	0,001	0,000	-
t	2,554	2,698	2,071	1,966	2,099	2,102	1,929	2,100	2,024	1,781	1,469	1,326	2,149	1,647	1,666	3,742	2,250	0,031	-
Sig.	0,011	0,007	0,039	0,050	0,036	0,036	0,054	0,036	0,044	0,076	0,143	0,185	0,032	0,100	0,096	0,000	0,025	0,974	0,189
	2	4	3	4	8	5	8	7	0	0	0	8	6	8	8	2	3	8	6
CSI																			
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
t	0,312	1,618	1,105	0,541	1	0,849	9	0,410	0,272	2	0,319	1,038	1,526	1,771	2,173	2,591	1,980	0,338	0,974
Sig.	0,755	0,106	0,270	0,588	0,860	0,396	0,983	0,681	0,785	0,970	0,749	0,300	0,128	0,077	0,030	0,010	0,048	0,735	0,331
	1	8	1	9	3	3	4	8	8	4	9	1	3	7	7	1	8	3	0
IDI																			
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
t	1,195	0,584	1,710	0,501	0,535	1,019	0,280	0,407	-	0,012	0,363	0,555	0,657	0,927	0,968	0,848	0,229	0,379	0,909
Sig.	0,233	0,559	0,088	0,616	0,593	0,309	0,779	0,684	0,990	0,716	0,578	0,511	0,354	0,333	0,396	0,818	0,704	0,364	0,000
	2	7	5	5	0	2	6	3	3	4	8	6	8	6	9	3	4	2	5
MCI																			
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	-	-	-	-	-
t	0,764	0,631	0,372	0,048	0,439	0,536	0,113	0,896	0,891	0,927	0,318	0,138	-	-	-	-	-	-	-
Sig.	0,445	0,528	0,710	0,961	0,660	0,592	0,909	0,370	0,373	0,354	0,750	0,890	0,784	0,592	0,402	0,112	0,103	0,128	0,054
	0	6	0	5	4	4	7	6	6	4	7	0	7	7	2	0	2	4	7

Appendix B Appendix A Quantile Regression Result for Phase II – April to December 2020

	q=0,0 5	q=0,1	q=0,1 5	q=0,2	q=0,2 5	q=0,3	q=0,3 5	q=0,4	q=0,4 5	q=0,5	q=0,5 5	q=0,6	q=0,6 5	q=0,7	q=0,7 5	q=0,8	q=0,8 5	q=0,9	q=0,9 5	
(Intercept)																				
Coefficient	0,003	0,003	0,000	-	0,000	-	-	-	-	-	-	-	-	-	-	0,002	0,006	0,005	0,009	
t	0,501	0,695	0,142	-	0,056	-	-	-	-	-	-	-	-	-	-	0,581	1,538	0,991	1,329	
Sig.	0,616	0,487	0,886	0,953	0,955	0,574	0,196	0,070	0,193	0,085	0,102	0,191	0,377	0,268	0,325	0,561	0,124	0,322	0,184	
PI																				
Coefficient	0,000	-	0,000	0,000	0,000	0,000	-	-	-	-	0,000	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	
t	0,041	-	0,580	0,158	0,012	0,161	-	-	-	-	-	-	-	0,196	1,806	2,398	2,416	1,505	2,665	
Sig.	0,967	0,614	0,561	0,874	0,990	0,871	0,603	0,174	0,303	0,642	0,788	0,477	0,686	0,844	0,071	0,016	0,015	0,132	0,007	
HY																				
Coefficient	0,000	-	0,000	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	0,000	0,000	0,000	
t	0,063	0,620	0,097	0,706	0,153	0,274	0,573	1,240	1,562	1,430	1,196	1,040	1,197	0,987	0,149	-	0,531	1,427	1,848	
Sig.	0,949	0,535	0,922	0,480	0,878	0,783	0,566	0,215	0,118	0,152	0,231	0,298	0,231	0,323	0,881	0,579	0,595	0,153	0,064	
FNI																				
Coefficient	0,000	0,000	0,000	-	0,000	0,000	-	-	-	-	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	
t	0,842	0,584	0,576	0,206	0,164	0,533	0,941	1,479	0,751	1,314	1,037	-	0,101	-	0,091	-	1,419	1,848	1,355	5,403
Sig.	0,399	0,559	0,564	0,836	0,869	0,593	0,346	0,139	0,452	0,189	0,299	0,919	0,878	0,926	0,831	0,156	0,064	0,175	0,000	
CSI																				
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	-	-	0,000	0,000	0,000	0,000	
t	0,430	0,884	0,252	0,365	-	-	-	-	-	-	-	-	-	-	-	1	1	1	0,035	-
Sig.	0,667	0,376	0,801	0,714	0,753	0,863	0,273	0,468	0,525	0,386	0,501	0,487	0,117	0,091	0,037	0,380	0,338	0,971	0,580	
IDI																				
Coefficient	0,000	0,000	0,000	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	
t	1,145	1,139	0,807	0,017	-	0,229	0,747	0,672	0,687	1,261	1,292	1,038	0,674	1,037	1,061	1,393	0,629	0,562	0,374	
Sig.	0,252	0,254	0,419	0,985	0,982	0,818	0,454	0,501	0,492	0,207	0,196	0,299	0,500	0,299	0,288	0,163	0,529	0,573	0,708	
MCI																				
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	0,000	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	-	
t	1,267	0,647	1,028	0,515	1,049	0,917	0,790	0,518	0,978	0,651	0,263	-	0,044	0,012	0,284	1,012	0,718	-	-	
Sig.	0,205	0,517	0,303	0,606	0,294	0,359	0,429	0,604	0,327	0,515	0,792	0,964	0,990	0,776	0,311	0,472	0,721	0,496	0,205	

Appendix C Appendix A Quantile Regression Result for Phase III – January to December 2020

	q=0,0 5	q=0,1	q=0,1 5	q=0,2	q=0,2 5	q=0,3	q=0,3 5	q=0,4	q=0,4 5	q=0,5	q=0,5 5	q=0,6	q=0,6 5	q=0,7	q=0,7 5	q=0,8	q=0,8 5	q=0,9	q=0,9 5	
(Intercept)																				
Coefficient	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,000	0,003	0,006
t	0,009	0,004	0,002	0,002	0,002	0,002	0,002	0,003	0,002	0,002	0,002	0,001	0,001	0,001	0,001	0,000	1	5	3	6
Sig.	0,325	0,332	0,390	0,428	0,340	0,281	0,230	0,120	0,280	0,284	0,213	0,465	0,593	0,579	0,596	0,965	0,882	0,440	0,287	
PI																				
Coefficient	-	-	-	-	-	-	-	-	-	-	-	-	0,000	0,000	0,000	0,000	0,000	0,000	0,001	
t	0,002	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0	1	1	2	4	4	3	
Sig.	0,000	0,000	0,000	0,000	0,081	0,062	0,149	0,265	0,314	0,185	0,499	0,539	0,981	0,490	0,299	0,175	0,004	0,054	0,000	
HY																				
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	
t	0	1	1	0	0	1	1	0	1	1	1	1	1	1	1	0	1	2	1	
Sig.	0,879	0,706	0,505	0,812	0,847	0,527	0,271	0,499	0,214	0,406	0,233	0,406	0,127	0,167	0,427	0,801	0,235	0,154	0,507	
FNI																				
Coefficient	0,000	0,000	-	-	-	-	-	-	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,001	
t	0,252	0,287	-	-	-	-	-	-	-	0,485	1,277	1,383	0,732	0,624	0,306	1,650	1,754	4,400	3,034	
Sig.	0,800	0,774	0,678	0,486	0,797	0,532	0,589	0,261	0,583	0,627	0,201	0,166	0,464	0,532	0,759	0,099	0,079	0,000	0,002	
CSI																				
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	-	-	-	0,000	-	-	
t	1,064	2,477	2,147	1,236	0,968	0,268	0,520	0,201	-	-	-	-	-	-	-	-	-	-	-	
Sig.	0,287	0,013	0,031	0,216	0,333	0,788	0,603	0,840	0,599	0,604	0,591	0,542	0,099	0,021	0,008	0,102	0,342	0,106	0,259	
IDI																				
Coefficient	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	
t	0,222	-	-	0,625	0,765	0,597	1,614	2,544	1,355	1,273	1,163	1,373	0,764	0,966	1,440	1,467	1,060	0,464	0,859	
Sig.	0,824	0,922	0,760	0,531	0,444	0,550	0,106	0,011	0,175	0,203	0,244	0,170	0,444	0,333	0,150	0,142	0,289	0,642	0,390	
MCI																				
Coefficient	-	-	-	-	-	-	-	-	-	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-	-	
t	0,439	1,046	1,094	1,121	1,166	1,168	1,785	1,400	1,314	0,615	0,562	0,336	0,505	0,268	8	4	0,254	0,478	0,425	
Sig.	0,660	0,295	0,274	0,262	0,243	0,243	0,074	0,161	0,189	0,538	0,573	0,736	0,613	0,788	0,906	0,691	0,799	0,632	0,670	