

EXAMINING THE IMPACT OF GOVERNMENT INTERVENTION ON STOCK MARKET PERFORMANCE AMID COVID-19: THE CASE OF ASEAN COUNTRIES

Hoang Cam Huong Pham, Thi Bich Ngoc Tran, Thanh Cong Bui

Faculty of Accounting and Finance, University of Economics

– Hue University, Vietnam

Email: phchuong@hce.edu.vn

ABSTRACT

This study examines the impact of strictness of government policy responses during the COVID-19 pandemic on the stock market performance in five of the Association of Southeast Asian Nations (ASEAN) member countries including Indonesia, Malaysia, Philippines, Thailand and Vietnam. In this study, the stock market performance are measured by two aspects, stock returns and volatilities. Also, the strictness of government policies during the COVID-19 pandemic is measured by the Stringency Index GARCH(1,1) which is adopted in the study to predict the volatilities in stock markets. The empirical results from regression models show that the five stock markets in react so much more forcefully once the governments impose restrictions during COVID-19. Specifically, the intervention of governments, such as lockdown policies or travel restrictions, has detrimental impact on the five ASEAN stock markets, characterized by lower stock returns and higher stock volatilities. These findings might suggest helpful policy implications to key stakeholders in order to mitigate the dramatic effects of COVID-19 widespread or other crises in the future.

Keywords: *Government intervention, stringency index, stock market performance, ASEAN countries, COVID-19*

1. INTRODUCTION

On March 2020, Covid-19, which caused by SARS-CoV-2 virus, was officially announced as a global pandemic. From the first known case in Wuhan, SARS-CoV-2 and its variants quickly spread out to over the world.

According to Johns Hopkins University, at the end of May, 2022, there are more than 530 million confirmed cases with over 6 million deaths across the globe.

Under the widespread of the pandemic, almost all economies have suffered serious losses. According to Albulescu (2021), this deadly coronavirus causes a huge loss to various economic industries such as trade, tourism, transportation or even local cuisine. Not an exception, many stock markets over the world have witnessed a dramatic decrease. When the global pandemic is confirmed in March 2020, the US stock market plummeted with the Dow Jones Industrial Average Index reduced by 6.400 points, approximately 26%. At that time, Vietnamese stock market was also affected by the pandemic. VN-Index dropped by 35%, the highest decrease over the past 3 years.

In respond, governments around the world have implemented with emergency actions, such as social distancing (including closure of school, workplaces, markets, travel restrictions, etc), containment and health response (raising public awareness about the pandemic, testing and quarantining policies), and income support packages (government financial aid in the form of cash). The main purpose of these actions is to contain the spread of the pandemic and minimize the economic impact at the same time. However, the effectiveness of these efforts is uncertain. For example, social distancing could reduce the number of infected cases, but it also affects the income of millions of people. The impacts of government actions on stock markets, which contain the pool of sophisticated and noise traders, is even more unpredictable. Containment and health response and income support packages are likely to have positive impacts on the market since it boosts the investors' confidence and mitigate the economic affects due to the pandemic. However, social distancing may have both direct and indirect impacts on the stock markets. For the direct effect, this action may reduce the stock market returns and increase the stock volatility since it adversely impacts the economic activities. On the contrary, in long term, social distancing may help to control the number of new infections, which in turn, will facilitate the economic development and therefore positively impact the stock market.

For that reason, this research then aims to evaluate the behavior of the financial markets under the implementation of social distancing measures, which is represented by the Stringency Index. This index captures social

distancing and total lockdown policies of one country once the COVID-19 pandemic enacted. To be more specific, we would like to capture the influence of the government's intervention on the stock market performance characterized by two aspects, which are stock returns and stock volatilities. The paper focuses on the stock markets from some of the most affected countries in ASEAN since there is a lack of research that is conducted on stock markets of this region. Also, according to the WorldAtlas, these selected countries are considered as the five dominant Southeast Asian countries, which are Thailand, Malaysia, Indonesia, the Philippines and Vietnam. These markets all witnessed a rapid plunge from mid-February to late March, as was in the US stock market.

Within the scope of this study, the following question is raised: How does government's intervention affect stock market performance in some of ASEAN countries?

The contribution of this paper to the literature is three-fold. First, to the best of our knowledge, this is one of the first studies investigating the impact of social distancing measures on the major ASEAN stock markets by a panel regression approach. This fills the gap in the existing literature that has not investigated the effect of COVID-19 pandemic on ASEAN emerging markets as a whole yet. Second, previous studies focus on either stock market returns or stock market volatilities. In our study, we consider comprehensively the impact of government intervention on stock market performance by two aspects, including stock returns and volatilities. Third, this paper might suggest meaningful insights and appropriate policies for ASEAN policymakers to understand the impact of COVID-19 and maintain their stock markets better in the future.

The rest of the paper proceeds as follows: Section 2 introduces the literature review about the research problem. Section 3 represents the data and research methods. Empirical results will be presented in Section 4. Finally, section 5 concludes the study.

2. LITERATURE REVIEW

A quickly growing of research have been done related to the impact of the COVID-19 pandemic on the economy and financial markets. Specifically, a huge body of literature has previously investigated the impact of COVID-19

development on capital markets (Al-Awadhi et al., 2020; Baker et al., 2020, He et al., 2020; Liu et al., 2020; Tahat & Ahmed, 2020) and figured that the COVID-19 negatively affects stock market around the globe. Al-Awadhi et al (2020) investigated the impact of confirmed cases and total deaths caused by COVID-19 on from the Hang Seng Index and Shanghai Stock Exchange Composite Index from January 10th to March 16th 2020. The study indicated that the daily stock returns were negatively affected by the COVID-19 development. Baker et al. (2020) point out that the US stock market was more affected by the COVID-19 outbreak than to previous crises such as the 2003 SARS 2003 or the 2009 Wine Flu. Liu et al. (2020) and He et al. (2020) both document that Asian stock markets reacted so much more forcefully under the effects of COVID-19 than other capital markets. Regarding the UK stock market, the sectoral market returns witnessed a severe impact by the outbreak (Tahat & Ahmed, 2020).

Another strand of literature focus on analyzing the impacts of government interventions on stock market during the outbreak of COVID-19. However, the literature is yet to form a consensus around this topic. Chang et al. (2021) claimed that government responses such as closing down workplaces, restricting international travel, implementing financial support, etc have a positive impact on stock market returns by using panel data of 20 countries in the period from 2nd January 2020 to 21st July 2020. In the similar vein, Ashraf (2020) reached to the same conclusion when analyzing daily data of market returns of 77 stock markets from January 22 to April 17, 2020. The study stated that stock market returns will increase given government interventions such as raising public awareness campaigns, quarantining policies, providing income support packages. Interestingly, the government social distancing measures affect the stock market returns negatively. Similar to Ashraf (2020), Yang and Deng (2021) applied the panel regression model for the data from 20 OECD countries and obtained a same conclusion. The government response index, containment and health index and stringency index all positively affect the stock market returns.

Differently, according to Shanaev et al. (2020), government policy intervention, which can be specified into two categories namely lockdown measures and financial supports, is even the main driver for the downturn of

the stock market. Adopting the event study, Liu et al. (2020) indicate an increase in stock volatility in countries which are affected by the COVID-19 outbreak. Zaremba et al. (2020) use the sample of 67 countries about the stringency of policy responses to prove that such interventions would increase the volatilities of the equity market. Baker et al. (2020) also agree on that point and state that the trading restrictions and social distancing are the main reasons for the unprecedented reaction of the US stock market. By applying the dynamic Spatial Durbin Model with fix effect on the data of 45 major stock indices, Alexakis et al. (2021) also conclude that stock market returns are negatively correlated with the intensity of social distancing. Therefore, government intervention can have both positive and negative impacts on the stock market, depending on the measurement of government intervention during the time of COVID-19 pandemic.

Several studies in ASEAN countries related to the COVID-19 pandemic have been done lately. Sutrisno et al. (2021) documented a significant relation between the COVID-19 pandemic and stock returns on ASEAN stock exchanges by using an event study approach. Sadiq et al. (2021) investigate the effects of COVID-19 on ASEAN stock markets from 21st March 2020 to 31st April 2020, with a focus on the most affected sectors. The empirical results show that the COVID-19 negatively affects the stock markets in these countries, in which Indonesia and Singapore were the most affected countries. La and Miranti (2021) indicated that government intervention in South-East and East-Asia markets, such as public event cancellations, school closures, domestic travelling bans, stay-at-home encouragement did help to reduce the COVID-19 spread in these countries. However, there is lack of studies investigating the stringency of government policy responses on stock market performance in ASEAN stock markets.

Hence, concerning the gap in the literature, our study aims to provide a comprehensive look into the effect of government intervention during the time of COVID-19 on stock market performance in ASEAN stock exchanges by approaching two aspects of performance: stock returns and stock volatilities. In brief, it has been suggested in previous studies that stringency index has a negative effect on stock returns. Different from previous studies, we extend the investigation period longer to address the intervention of the government more carefully.

In this study, we propose the following hypotheses:

Hypothesis 1: The strictness of government policies reduces stock market returns.

Hypothesis 2: The strictness of government policies increases stock market volatilities.

3. DATA AND METHODOLOGY

3.1. Data source

The time frame in this study spans from 11th March 2020 when WHO declared COVID-19 outbreak as global pandemic, until 1st August 2021. The stock indices used in the study are retrieved from the website Investing.com. The stock market return is then calculated by the daily change in the stock index. The core explanatory variable is the stringency index, which is one of the four main indicators of the government's policy response during COVID-19 pandemic, which is collected from the database of the Oxford COVID-19 Government Response Tracker (OxCGRT). The stringency index is measured by the nine metrics, including school closures, workplace closures, cancellation of public events, restrictions on public gathering, closures of public transports, stay-at-home requirements, public information campaigns, restriction on international movements and international travel controls.

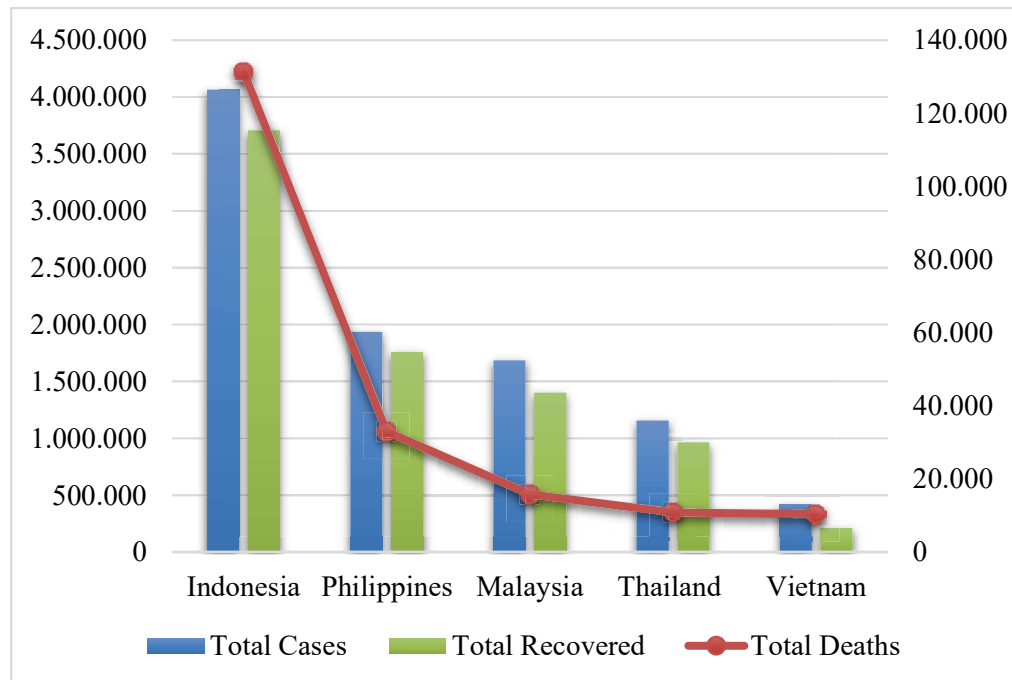


Figure 1. COVID-19 cases, deaths and recovered patients as of August 2021

(Source: www.worldometers.info/coronavirus/#countries) Worldometers)

Also, similar to the study of He et al. (2020), in this study, we adopt S&P 500, VIX (CBOE Volatility Index), WTI (West Texas Intermediate) Oil price, Exchange rates between USD and other currencies as control variables. Data on these variables are also collected from the website Investing.com.

We choose the top five most affected countries in ASEAN according to Reporting ASEAN¹ as of August 2021. These countries are also considered as the major financial markets in ASEAN. Figure 1 presents the number of confirmed cases, deaths and recovered patients in our sample countries.

3.2. Methodology

3.2.1. GARCH(1,1) model

We adopt the GARCH(1,1) model which was proposed by Bollerslve (1986) to estimate stock volatilities. GARCH(1,1) is conceived as the most robust and simplest model in estimating volatilities (Engle, 2001).

The GARCH (1,1) model equation is presented as follows:

$$\sigma_n^2 = \gamma V_L + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2$$

where:

V_L : the long-run variance rate

u_{n-1} : the rate of the return of the day n-1

σ_{n-1} : the variance of the day n-1

γ , α and β : the weights assigned to V_L , u_{n-1}^2 and σ_{n-1}^2 respectively and $\gamma + \alpha + \beta = 1$

Setting $\omega = \gamma.V_L$, the GARCH(1,1) model can also be written as:

$$\sigma_n^2 = \omega + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2$$

To reach a stable GARCH(1,1) process, the condition is that $\alpha + \beta < 1$. The maximum likelihood method is engaged to estimate this model.

3.2.2. Panel regression model

Earlier studies on the COVID-19 pandemic mainly adopt the event-study method. However, Al-Awadhi et al. (2020) propose that the event-study is not suitable since the start date is not the same as the peak of the

¹ <https://www.reportingasean.net/covid-19-cases-southeast-asia/>

event. Baltagi (2021) signifies that in examining a group of countries, panel data regression is the most appropriate methodology, which can reduce bias estimates and also control for multicollinearity and individual heterogeneity. We then choose to apply the random-fixed effect model in our study. Similar to previous studies (Liu et al., 2020; Shanaev et al., 2020); Zaremba et al., 2020), the independent variables are employed by their lags of 1. Additionally, the country fixed-effect dummy variables are also included to control for the factors which are fixed over the observed period but can change across 5 countries in our sample.

Our baseline models are described below:

$$\begin{aligned} Return_{i,t} = & \alpha_0 + \beta_1 Stringency Index_{t-1} + \sum_{i=1}^{C-1} \beta_i C_i \\ & + Control Variables_{t-1} + \varepsilon_{i,t} \quad (1) \end{aligned}$$

$$\begin{aligned} Volatility_{i,t} = & \alpha_0 + \beta_1 Stringency Index_{t-1} \\ & + \sum_{i=1}^{C-1} \beta_i C_i + Control Variables_{t-1} + \varepsilon_{i,t} \quad (2) \end{aligned}$$

Where

$Return_t$ is the stock market returns in country i on day t .

$Volatility_t$ is the stock market volatility in country i on day t .

$Stringency Index_{t-1}$ indicate the action of government such as lock down policies or cancellation of public events in country i during the COVID-19 pandemic on day $t - 1$.

C_i represents for country dummy variables.

$Control Variables_{t-1}$ include a set of variables which refers to the variation from the major stock market, the US, such as S&P500 daily returns, daily changes in VIX, WTI oil price and exchange rates. Specifically, in the model (1), the control variables include the lag variables of S&P500 daily returns, WTI oil price and exchange rates. In the model (2), as the dependent variable is the stock volatility, we include daily changes in VIX as the control variable instead of using S&P500, other variables are still the same. We use the percentage change of these variables in the econometric models.

4. RESULTS

4.1. Descriptive Statistics

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Stock Return	1,624	0.0806	1.719	-13.34	8.97
Stock Volatilities	1,624	1.477	0.8714	0.5876	6.871
Stringency Index (t-1)	1,624	0.283	5.152	-30.582	118.914
SP500 (t-1)	1,624	0.147	1.761	-11.98	9.38
VIX (t-1)	1,624	26.603	10.725	15.07	82.69
Oil price (t-1)	1,624	-0.957	18.936	-305.97	37.66
Exchange rate (t-1)	1,624	0.007	0.366	-2.75	4.57

(Source: Author's computation)

As can be seen from table 1, the average stock return in the sample is about 0.08% and the lowest point is -13.34%, recorded in Philippines on 19th March 2020. It is notable that March 2020 was also highlighted by the dramatic stock market crash around global markets. The stringency index has reached the maximum point of about 119, which was recorded in Malaysia recently. Specifically, the strictness of government response during the time of COVID-19 pandemic gradually increases overtime for each country, meaning that the governors in these ASEAN countries have considerably changed the policy responses to moderate the severe impact of the COVID-19 pandemic.

4.2. Multicollinearity test

Table 2. Multicollinearity test

	Return	Volatilities	Stringency	SP500	VIX	Oil price	Exchange rate
Return	1.000						
Volatilities	0.0298	1.000					
Stringency	-0.1136	0.1552	1.000				
SP500	0.2371	0.0179	0.0610	1.000			
VIX	-0.1126	0.7130	0.1323	-0.171	1.000		
Oil price	0.1241	-0.1107	-0.0024	0.1556	-0.131	1.000	
Exchange rate	0.0662	0.1041	-0.0020	-0.089	0.1402	0.0014	1.000

(Source: Author's computation)

Organizing Institutions:

Can Tho University - Hue University of Economics - Tay Nguyen University - Sofia University, Bulgaria

The result from the multicollinearity test shows there is no high correlation among variables, as the correlation coefficients are below 0.8.

4.3. Stationary test

The stationary test was adopted to check whether a time series possesses a unit root. We employed the Fisher-type tests which was developed by Choi (2001), in which the hypothesis states that all the panels contain the unit root. All variables in the regression models are stationary for the whole period.

4.4. Panel regression results

Table 3. Panel regression results for model (1)

VARIABLES	Stock Returns
Stringency (t-1)	-0.0576** (0.0259)
SP500 (t-1)	0.237*** (0.0202)
Oil prices (t-1)	0.00816*** (0.00102)
Exchange rates (t-1)	0.389*** (0.116)
Constant	0.0878*** (0.0287)
Country fixed-effect	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(Source: Author's computation)

Similar to the study Owjimehr and Samadi (2022) for the Iran context, the stringency level of government policies, which are school closures, cancellation of public events or restrictions on public gatherings, reduces the stock returns. The result also shows that the return on the US stock exchange can improve the stock returns in ASEAN countries. Furthermore, there is a

positive relationship between exchange rates and stock market returns. In addition, a higher in oil price might lead to a higher in stock market return among the five ASEAN countries in the sample. We might expect that exchange rate policy can also mitigate adverse impacts on the stock markets in the region.

Table 4. Panel regression results for model 2

VARIABLES	Stock Volatilities
Stringency (t-1)	0.0112* (0.00652)
VIX (t-1)	0.0565*** (0.0168)
Oil prices (t-1)	-0.000737 (0.000625)
Exchange rates (t-1)	4.06e-05 (0.0741)
Constant	-0.0596 (0.421)
Country fixed-effect	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(Source: Author's computation)

As can be seen from table 4, the stringency level of government policies increases the stock volatilities, meaning that the strictness of government lead to risk aversion and pessimism among investors in ASEAN countries. This result is akin to Baker et al. (2020), Sharif et al. (2020), Zarembo et al. (2020). Furthermore, CBOE VIX also leads to higher volatility in ASEAN stock markets, meaning that the market risk from the US stock exchange boosts the fear and stress of investors in these countries. This finding indicates that the developing stock markets are strongly affected by the developed ones. Additionally, oil price changes at the lag of 1 seem to not affect the stock volatilities. It can be partly explained that the WTI oil price takes time to influence the national stock markets.

In sum, the two hypotheses are confirmed, meaning that the strictness of government policies negatively affect the stock market performance in ASEAN countries.

4.5. Robustness checks

We re-examined the results by using another regression method, which is the Panel-Corrected Standard Errors (PCSE). This method could also account for the contemporaneous correlation across the panels. The result stays the same as that of the baseline models. Results are available upon request.

5. CONCLUSION

The study aims to look into the influence of the government's intervention on stock market performance during the COVID-19 pandemic in ASEAN stock markets. We can confirm that there is a negative effect on these stock markets once the strict policies of government enacted, which are school closures, travel restrictions, lockdown policies, etc. Specifically, during the observed period, these stock markets were characterized by lower stock returns and higher stock volatilities under the strictness of government policies. On top of that, the global stock performance could further dampen the performance of these ASEAN stock markets under the intervention of governments. The results from this study suggest that the five stock markets have to beware of not only the domestic policies but also the fluctuation in the global stock market.

This research can be developed by considering the impact of COVID-19 development, stringency for containment in the US, a leading stock market in the world, or local policies such as monetary policy and fiscal policy.

REFERENCES

- Albulescu, C. T. (2021). COVID-19 and the United States financial markets' volatility. *Finance Research Letters*, 38, 101699.
- Alexakis, C., Eleftheriou, K., & Patsoulis, P. (2021). COVID-19 containment measures and stock market returns: An international spatial econometrics investigation. *Journal of Behavioral and Experimental Finance*, 29, 100428.

- Ashraf, B. N. (2020). Economic impact of government interventions during the COVID-19 pandemic: International evidence from financial markets. *Journal of behavioral and experimental finance*, 27, 100371.
- Baker, S. R., Bloom, N., Davis, S. J., Kost, K. J., Sammon, M. C., & Viratyosin, T. (2020). *The unprecedented stock market impact of COVID-19* (No. w26945). national Bureau of economic research.
- Baltagi, B. H. (2021). *Econometric analysis of panel data*. Springer Nature.
- Bollerslev, T. (1986). Generalized Autoregressive Conditional Heteroscedasticity. *Journal of Econometrics*, 31, 307–327.
- Chang, C. P., Feng, G. F., & Zheng, M. (2021). Government Fighting Pandemic, Stock Market Return, and COVID-19 Virus Outbreak. *Emerging Markets Finance and Trade*, 1-18.
- Choi, I. (2001). Unit root tests for panel data. *Journal of international money and Finance*, 20(2), 249-272.
- Engle, R. F. (2001). *GARCH 101: An Introduction to the Use of ARCH/GARCH Models in Applied Econometric* (Vol. 30). NYU Working Paper No. FIN-01.
- He, Q., Liu, J., Wang, S., & Yu, J. (2020). The impact of COVID-19 on stock markets. *Economic and Political Studies*, 8(3), 275-288.
- La, H. A., & Miranti, R. (2021). Financial Market Responses to Government COVID-19 Pandemic Interventions: Empirical Evidence from South-East and East Asia. Retrieved from: https://www.eria.org/uploads/media/discussion-papers/ERIA-Research-on-COVID-19/Financial-Market-Responses-to-Government-COVID-19-Pandemic-Interventions_Empirical-Evidence-from-South-East-and-East-Asia.pdf
- 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), 2800.
- Owjimehr, S., & Samadi, A. H. (2022). Government policy response to COVID-19 and stock market return: The case of Iran. In *Socioeconomic Dynamics of the COVID-19 Crisis* (pp. 423-439). Springer, Cham.

- Sadiq, M., Hsu, C. C., Zhang, Y., & Chien, F. (2021). COVID-19 fear and volatility index movements: empirical insights from ASEAN stock markets. *Environmental Science and Pollution Research*, 1-18.
- Shanaev, S., Shuraeva, A., & Ghimire, B. (2020). The financial pandemic: COVID-19 and policy interventions on rational and irrational markets. Available at SSRN 3589557. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3589557
- Sharif, A., Aloui, C., & Yarovaya, L. (2020). COVID-19 pandemic, oil prices, stock market, geopolitical risk and policy uncertainty nexus in the US economy: Fresh evidence from the wavelet-based approach. *International Review of Financial Analysis*, 70, 101496.
- Sutrisno, S., Panuntun, B., & Adristi, F. I. (2021). Pandemic impact of Covid-19 on the stock market index and return of stock market index (event study on stock market index in ASEAN exchange). Retrieved from: <https://ojs.uajy.ac.id/index.php/modus/article/view/4068>
- Tahat, Y., & Ahmed, A. (2020). Stock Market Returns and COVID-19 Outbreak: Evidence from the UK. *Memo: University of Dundee*.
- Yang, H., & Deng, P. (2021). The impact of COVID-19 and government intervention on stock markets of OECD countries. *Asian Economics Letters*, 1(4), 18646.
- 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, 101597.