

Stock Market Reaction to COVID-19 Pandemic: A Systematic Literature Review

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ABSTRACT

Over the past few decades, countries all over the world have experienced tremendous economic growth via business globalization. However, the arrival of the COVID-19 pandemic has brought historic disruption to the global economy. The stock market also depicts various reactions towards the declaration of the COVID-19 as a global health emergency by the World Health Organization (WHO). The global stock markets' reaction towards the COVID-19 pandemic has led to negative and positive returns even though the responses were not uniform across countries. Thus, this paper aims to review the literature of the impact of COVID -19 declaration on stock market reactions. The review covers 36 related papers published until 2021 which were content analyzed with their theoretical background, research design, the scope of research, sampling/ data collection methods, data analysis, and thematic areas covered. The result indicates that the stock market reacts differently to the arrival of the COVID -19 pandemic.

Keywords: *Covid-19, Stock Market Reaction, Stock Price, Stock Return, Systematic Literature Review*

INTRODUCTION

For the past few years, the stock market experienced a remarkably fruitful year and most countries have enjoyed incredible economic growth via international trade and business globalization. However, the COVID-19 pandemic arrival in December 2019 across 215 countries was an unexpected shock to the global economy. It has affected both developed and emerging countries (Harjoto, Rossi & Paglia 2021; Barua & Barua 2021). The pandemic has spread all over the world within a short period has devastated the global economy, financial markets, and risk of collapses in the healthcare system of many countries (Danisman, Demir & Zaremba 2021; Latif et al. 2021; Beirne et al. 2021). The asymptomatic transmission of the COVID-19 pandemic has made it harder to break the global spread. Therefore, COVID-19 has truly affected the economic landscape, led to turbulence in the financial market, economic contraction, financial crisis, and major consequences to the household (Al Nawayseh 2020; Latif et al. 2021).

Previously, multinational firms flourished from international trade by exporting their products to many countries. However, when the pandemic took place, firms were significantly affected by some restrictions imposed by the government as a response to emergency policy such as closing borders, travel bans, and lockdowns (Phan & Narayan 2020). In light of this, some

multinational firms may also cut their foreign investment and downsize (Au Yong & Laing 2021). The analysis reveals that any policy development and implementation during COVID-19 pandemic will significantly affect economic policy and the stock market (Izzeldin et al. 2021).

The world stock market also faces great uncertainty and has shown various reactions to COVID-19 infection since it is hard to control the global spread. According to Beirne et al. 2021, a high COVID-19 infection rate will strongly affect the economic landscape, particularly stock market performance. The stock market performance is declined if the number of confirmed cases increases in particular countries (Ashraf 2020; Feng et al. 2021; Al-Awadhi et al. 2020). The plethora of studies shows that the stock market in the developed and emerging economies of Asia and Europe experienced the sharpest impact from COVID-19 pandemic (Uddin et al. 2021; Beirne et al. 2021; Harjoto et al. 2021; Barua & Barua 2021). In the Australian stock market, the S&P ASX 200 (benchmark for Australian stock price) has declined more than 25% starting from the end of January 2020 to the end of March 2020 (Rahman, Amin & Al Mamun 2021). The unexpected arrival of the COVID-19 also created a negative abnormal return for the small-cap equity index as compared to the large-cap equity index (Harjoto, Rossi & Paglia 2021). However, some of the investors could gain a significant profit during the pandemic. Some policies and restrictions imposed had a positive impact on the stock return when the new confirmed cases declined (Jiang et al. 2021; Latif et al. 2021).

Several studies have explained the impact of lockdown and spread of COVID-19 pandemic on stock market return and performance (Tao et al. 2021; Izzeldin et al. 2021; Phan & Narayan 2020). Other studies examined the stock market reactions towards COVID-19 pandemic in emerging and developed countries, the US, UK, European countries, Pacific and South Asia, and Australia (Ahmad, Kutan & Gupta 2021; Harjoto et al. 2021; Jiang et al. 2021; Rahman, Amin & Al Mamun 2021). Thus, this review paper is an early attempt to highlight the impact of the COVID-19 pandemic and the methodology utilized to measure the stock market reactions. This paper also offers contributions to the literature in terms of stock market return and stock market performance.

RESEARCH DESIGN

We performed a Systematic Literature Review (SLR) to select and code relevant articles to answer the research question. This paper utilized five steps of systematic literature review in searching and selecting articles adapted from (Ampatzoglou et al. 2015; Umar Farooq 2017; Shaffril, Krauss & Samsuddin 2018). To obtain all relevant articles for the SLR, we used Web of Science (WoS) as the main source. WoS has been widely known as a robust and established platform and database that covers over 256 disciplines including interdisciplinary social sciences, environmental studies, social issues, and development and planning.

The next step is eligibility and exclusion criteria are identified. Concerning the literature type, the empirical and SLR articles are included. Therefore, all the conference proceedings, review articles, book series, chapters in a book (CIB) are all excluded from the review process. Moreover, the article timeline included is selected from 2017 – 2021 based on the pre-COVID-19 period. In terms of language, the review will only choose English publications to avoid confusion.

To complete the comprehensive analysis, five different stages were involved in the systematic searching and selecting process (see Figure 1). These processes explained research questions and how a systematic literature review has been executed by the author. These five steps include (1) defining scope and objectives, (2) identification, (3) screening, (4) eligibility, (5) data reporting and analysis (Ampatzoglou et al., 2015; Umar Farooq, 2017; Shaffril et al., 2018). The objective of this paper is to examine the stock market reaction to COVID-19 pandemic.

Figure 1 illustrates the steps and processes taken to derive the number of papers selected for this systematic literature review. For an initial process, we found 60 papers. After reading the titles and abstracts to assess unrelated papers, 8 papers have been removed, leaving 52. Then, using the inclusion and exclusion process, another 16 papers have been further removed. Finally, 36 selected papers will be used for the SLR process. In more than 90% of the selected papers, the use of variables was associated with a causal effect to examine the impact of the COVID-19 pandemic on stock market reactions, stock return, and financial market.

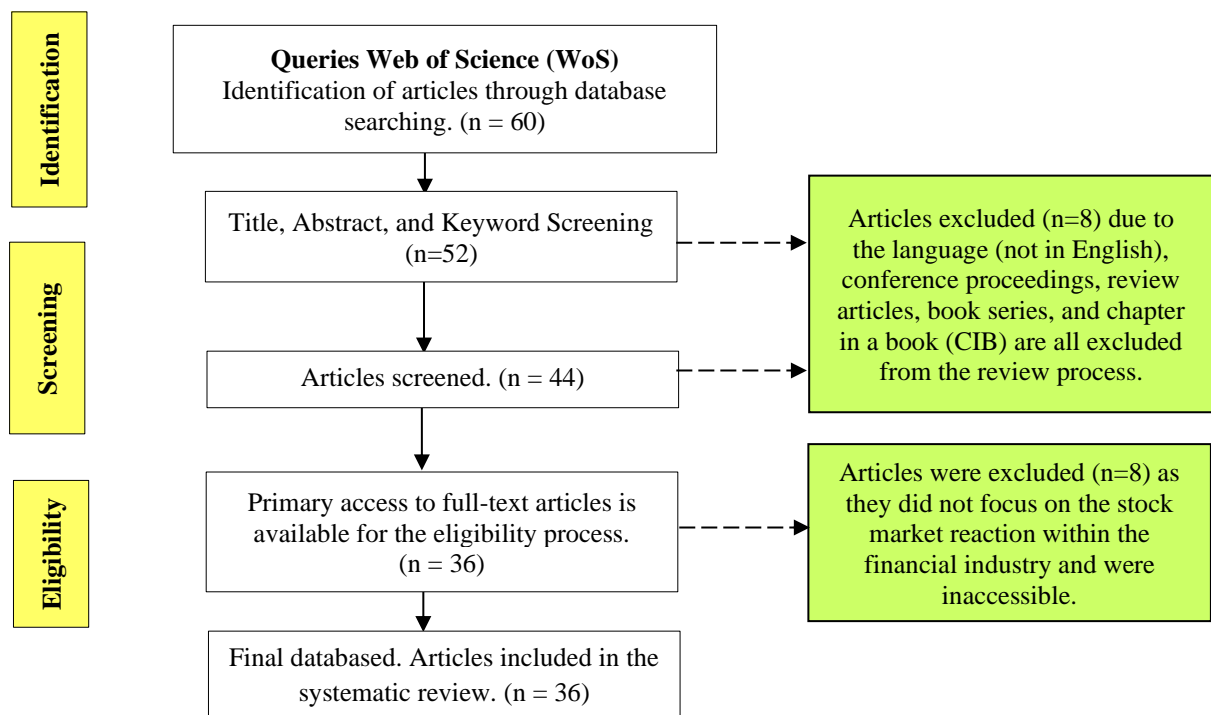


Figure 1: The flow of the systematic review process
 Adapted from: Umar Farooq (2017), Shaffril et al., (2018) and Ali et al. (2021)

Scope of Research

Most of the selected papers in this review focused on the stock market reactions to COVID-19 in different aspects of the country. Concerning the country that gained the most attention for the research on the impact of the COVID-19 pandemic on the stock market reaction in the United States (US) with 33%, followed by Europe countries 8%.

Several studies have been executed in the United Kingdom (UK), China, and Australia which made up 6% respectively. In addition, several articles (3%) examine the reactions of the stock market towards the WHO announcement to COVID-19 in the emerging and developed countries, Canada (3%), Pakistan (3%), Pacific, and South Asia. Thus, all other continents are likely under- studied probably due to the recent emergence of the COVID-19 pandemic.

Sampling/Data Collection

The review is generally based on firm-level information for companies listed on a stock exchange. The United States, the United Kingdom, and European countries dominated the list of countries involved in the previous research ranging from early 2020 up to the end of 2021 (Gu 2020; Engelhardt et al. 2021; Sikarwar 2021). As a whole, the selected papers show that the related sample sectors to investigate the stock market reactions are an information technology firm, banking sectors, telecommunications, financial sectors, industry, and oil and gas (Ahmad, Kutan & Gupta 2021). It involved 47 national stock markets and a sample of 1927 public listed banks from 110 countries (Joseph et al. 2021). Ahmad, Kutan & Gupta 2021 completed the study by utilizing daily S&P 500, FTSE-350 (Financial Times Stock Exchange) to obtain data for the US industry's sector namely information technology, consumer, health, financial, telecommunication, energy, and utilities. A study by Goodell & Huynh (2020) used daily stock returns for 49 different industries in the US to capture the stock market reaction due to the COVID-19 pandemic.

The secondary data of the selected papers were obtained from Datastream, stock market indices, Refinitiv and include nine stock market indices such as FTSE MIB (Italy), DAX, FTSE, EURO STOXX, S&P 500, Dow Jones (DJ), Hang Seng, Shanghai Stock Exchange, and MSCI World (Ambros et al. 2021). Researchers also utilized firm daily data by collecting stock prices of the related constituents such as S&P- 500 (Standard and Poor's) for the USA, FTSE-350 (Financial Times Stock Exchange) for the UK, and S&P Europe (186 constituents) as representative indices (Harjoto, Rossi & Paglia 2021; Poretti & Heo 2021). In addition, a study on stock market reaction in the US marine industry used 43 listed shipping companies in New York Stock Exchange (NYSE) (Kamal, Chowdhury & Hosain 2021). Harjoto, Rossi & Paglia 2021 also examine the Visegrad group which consists of four central European countries which are Czechia, Hungary, Poland, and Slovakia as a sample to complete the study.

In China, to measure the stock market reactions and performance to COVID-19, 178,805 Chinese listed firms (Gu 2020) and daily stock return for 43 countries listed on main stock market indexes have been observed (Ashraf 2021). The rest of the papers utilized data from global equity markets (Huynh, Dao & Nguyen 2021), Composite Index data, risk-free rates, daily stock prices (Nurhayati et al. 2021), stocks market reports listed on the London Stock Exchange (LSE) (Joseph et al. 2021), and data of 50 stock market indexes from 42 countries, five regions (Asia Pacific, Europe, North America, Latin America, and, Arabian and Africa) (Huynh, Dao & Nguyen 2021). In completing the data collection, 10% of the articles utilized data from Economist Intelligence Unit (EIU) country reports which included 143 countries affected by pandemics (Cakici & Zaremba 2021). Poretti & Heo (2021) obtained the data from Thomson Reuters Datastream and studied 69 hospitality firms (hotels and restaurants) which consist of 41% from Europe and 59% from North America.

Data Analysis

Data analysis is a crucial process in completing a research paper. As for the selected papers for this review, the majority of the data was obtained from secondary sources or Datastream, mainly from the stock market report of the listed firms from various segments all over the world. The various method used to measure and analyze all data. Some of the common analytical tools used to capture the impact of related events or announcements are event study methodology (ESM), panel data analysis, and

econometric models. Other analytical tools used are correlation matrix, multivariate analysis, regression analysis, and panel ordinary least squares regression.

Concerning the methodology used in the selected papers, the event study methodology was the dominant method used by the stock market reaction research with approximately 30% of the research. Followed by Panel Data Analysis to investigate the stock market reactions to COVID- 19 pandemic (14%), regression model 16%, panel data and Ordinary Least Squares (OLS) 11% respectively, Capital Asset Pricing Model (CAPM) 6%, two-fold approach, and revised wavelet coherence methodology with 3% respectively and others 17%. The event study methodology can measure the impact of a major announcement. It's gaining popularity and has become one of the attractive techniques for business and marketing researchers to investigate the impact of a significant event or announcement especially during the emergence of the COVID- 19 pandemic (Tao et al. 2021). In light of this, the event study methodology has been used previously in economic and non-economic shocks, political happenings, stock performance, and global financial crises (Ali et al. 2021).

Recently, the research that relates to the impact of the COVID- 19 pandemic also utilized the event study methodology as their analytical tool to measure the impact of the pandemic on stock performance, Abnormal Return, and Cumulative Abnormal Return (CAR) in the various sector and industry (Kamal, Chowdhury & Hosain 2021; Nurhayati et al. 2021; Poretti & Heo 2021; Ahmad, Kutan & Gupta 2021). From the article, a method such as ANOVA, t-test, and descriptive analysis was reported less frequently used. Table 2 shows the most frequent method used in measuring the stock market reaction due to pandemics. The stock market reacts differently to the arrival of COVID- 19.

Table 2: Most Frequent Research Methodology Adopted by The Selected Papers

Methods	Quantitative method	Qualitative method
Event Study Method (ESM)	Arendt & Mestas 2021; Phan & Narayan 2020; Poretti & Heo 2021; Tao et al. 2021; Ali et al. 2021; Ahmad, Kutan & Gupta 2021; Chen & Yeh 2021; Ichev 2021; Kamal, Chowdhury & Hosain 2021; Heyden & Heyden 2020; Rahman, Amin & Al Mamun 2021	-
Panel Data Analysis	Latif et al. 2021; Beirne et al. 2021; Jiang et al. 2021; Huynh, Dao & Nguyen 2021; Demir & Danisman 2021; Danisman, Demir & Zaremba 2021; Engelhardt et al. 2021	-
Ordinary Least Squares (OLS)	Au Yong & Laing 2021; Ashraf 2020; Demir & Danisman 2021	-

CONCLUSION AND RECOMMENDATION

Stock market reaction has become an increasingly important topic to be explored by researchers. This study has attempted to examine the stock market reactions to COVID- 19 pandemic declaration and contributes to the existing literature and risk assessment of COVID- 19 pandemic in many aspects. Overall, the stock market reactions are varying according to the level of the pandemic. According to Hong, Bian & Lee (2021), the COVID-19 pandemic may affect various segments in financial sectors including the stock market but the reaction was different depending on the stage of pandemic. The lockdown period has also contributed to the stock market reactions where firms behave differently towards the announcement by the WHO. The review concluded that the immediate impact of the COVID- 19 pandemic on the stock market could be positive or negative. Fifteen US Industries such as medical and pharmaceuticals were identified as gaining positive abnormal returns as a response to COVID-

19 related news. However, US industries such as restaurants, hotels, and motels have shown negative abnormal returns.

It is important to note, for traders and speculators, the arrival of the COVID-19 pandemic may also associate with opportunities or profit creation for some multinational firms. Some large firms are more resilient and have a greater return on equity during COVID-19 pandemics (Au Yong & Laing 2021). The review also stated the relationship between stock market return and the number of COVID-19 confirmed cases. That is the stock market responds negatively or weakens as the number of confirmed cases increases in a country. As for the scope of research, the review shows that majority of the research focusing more on European countries and less focused on other single countries. Further research could be focused on other countries to capture the broader impact of COVID-19 pandemic on the financial market.

References

- Ahmad, W., Kutan, A.M. & Gupta, S. 2021. Black swan events and COVID-19 outbreak: Sector level evidence from the US, UK, and European stock markets. *International Review of Economics and Finance* 75(November 2020): 546–557.
- Al-Awadhi, A.M., Alsaifi, K., Al-Awadhi, A. & Alhammadi, S. 2020. Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance* 27: 100326.
- Ali, S.E.A., Lai, F.W., Dominic, P.D.D., Brown, N.J., Lowry, P.B.B. & Ali, R.F. 2021. Stock market reactions to favorable and unfavorable information security events: A systematic literature review. *Computers and Security* 110: 102451.
- Ambros, M., Frenkel, M., Huynh, T.L.D. & Kilinc, M. 2021. COVID-19 pandemic news and stock market reaction during the onset of the crisis: evidence from high-frequency data. *Applied Economics Letters* 28(19): 1686–1689.
- Ampatzoglou, A., Ampatzoglou, A., Chatzigeorgiou, A. & Avgeriou, P. 2015. The financial aspect of managing technical debt: A systematic literature review. *Information and Software Technology* 64: 52–73.
- Arendt, F. & Mestas, M. 2021. Coronavirus Disease (COVID-19) Pandemic and Stock Price Crashes: A Cross-National Correlational Approach. *Health Communication* 00(00): 1–8.
- Ashraf, B.N. 2020. Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance* 54: 101249.
- Ashraf, B.N. 2021. Stock markets' reaction to Covid-19: Moderating role of national culture. *Finance Research Letters* 41: 101857.
- Au Yong, H.H. & Laing, E. 2021. Stock market reaction to COVID-19: Evidence from U.S. Firms' International exposure. *International Review of Financial Analysis* 76: 101656.
- Barua, B. & Barua, S. 2021. COVID-19 implications for banks: evidence from an emerging economy. *SN Business & Economics* 1(1): 1–28.

- Beirne, J., Renzhi, N., Sugandi, E. & Volz, U. 2021. COVID-19, asset markets, and capital flows. *Pacific Economic Review* 26(4): 498–538.
- Cakici, N. & Zaremba, A. 2021. Who should be afraid of infections? Pandemic exposure and the cross-section of stock returns. *Journal of International Financial Markets, Institutions and Money* 72: 101333.
- Chen, H.C. & Yeh, C.W. 2021. Global financial crisis and COVID-19: Industrial reactions. *Finance Research Letters* 42(December 2020): 101940.
- Danisman, G.O., Demir, E. & Zaremba, A. 2021. Financial Resilience To the Covid-19 Pandemic: the Role of Banking Market Structure. *Applied Economics* 53(39): 4481–4504.
- Demir, E. & Danisman, G.O. 2021. Banking sector reactions to COVID-19: The role of bank-specific factors and government policy responses. *Research in International Business and Finance* 58(August): 101508.
- Engelhardt, N., Krause, M., Neukirchen, D. & Posch, P.N. 2021. Trust and stock market volatility during the COVID-19 crisis. *Finance Research Letters* 38: 101873.
- Feng, G.F., Yang, H.C., Gong, Q. & Chang, C.P. 2021. What is the exchange rate volatility response to COVID-19 and government interventions? *Economic Analysis and Policy* 69: 705–719.
- Goodell, J.W. & Huynh, T.L.D. 2020. Did Congress trade ahead? Considering the reaction of US industries to COVID-19. *Finance Research Letters* 36: 101578.
- Gu, J. 2020. Risk assessment on continued public health threats: Evidence from China's stock market. *International Journal of Environmental Research and Public Health* 17(20): 1–29.
- Harjoto, M.A., Rossi, F., Lee, R. & Sergi, B.S. 2021. How do equity markets react to COVID-19? Evidence from emerging and developed countries. *Journal of Economics and Business* 115: 105966.
- Harjoto, M.A., Rossi, F. & Paglia, J.K. 2021. COVID-19: stock market reactions to the shock and the stimulus. *Applied Economics Letters* 28(10): 795–801.
- Heyden, K.J. & Heyden, T. 2020. Market Reactions to the Arrival and Containment of COVID-19: An Event Study. *Finance Research Letters*: 101745.
- Hong, H., Bian, Z. & Lee, C.C. 2021. COVID-19 and instability of stock market performance: evidence from the U.S. *Financial Innovation* 7(1): 1–18.
- Huynh, N., Dao, A. & Nguyen, D. 2021. Openness, economic uncertainty, government responses, and international financial market performance during the coronavirus pandemic. *Journal of Behavioral and Experimental Finance* 31(May): 100536.
- Ichev, R. 2021. Stock price reaction to appointment of a chief health officer during COVID-19. *Journal of Behavioral and Experimental Finance* 31: 100541.
- Izzeldin, M., Muradoğlu, Y.G., Pappas, V. & Sivaprasad, S. 2021. The impact of Covid-19 on

- G7 stock markets volatility: Evidence from a ST-HAR model. *International Review of Financial Analysis* 74(October 2020).
- Jiang, B., Gu, D., Sadiq, R., Mohsan Khan, T. & Chang, H.L. 2021. Does the stringency of government interventions for COVID19 reduce the negative impact on market growth? Evidence from Pacific and South Asia. *Economic Research-Ekonomiska Istrazivanja* 0(0): 1–19.
- Joseph, N.L., Su, C., Huang, W. & Lai, B. 2021. Pricing of foreign exchange rate and interest rate risks using short to long horizon returns. *The European Journal of Finance*(May): 1–30.
- Kamal, M.R., Chowdhury, M.A.F. & Hosain, M.M. 2021. Stock market reactions of maritime shipping industry in the time of COVID-19 pandemic crisis: an empirical investigation. *Maritime Policy and Management* 00(00): 1–16.
- Latif, Y., Shunqi, G., Bashir, S., Iqbal, W., Ali, S. & Ramzan, M. 2021. COVID-19 and stock exchange return variation: empirical evidences from econometric estimation. *Environmental Science and Pollution Research* 28(42): 60019–60031.
- Al Nawayseh, M.K. 2020. Fintech in COVID-19 and beyond: What factors are affecting customers' choice of fintech applications? *Journal of Open Innovation: Technology, Market, and Complexity* 6(4): 1–15.
- Nurhayati, I., Endri, E., Aminda, R.S. & Muniroh, L. 2021. Impact of covid-19 on performance evaluation large market capitalization stocks and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity* 7(1): 1–16.
- Phan, D.H.B. & Narayan, P.K. 2020. Country Responses and the Reaction of the Stock Market to COVID-19—a Preliminary Exposition. *Emerging Markets Finance and Trade* 56(10): 2138–2150.
- Poretti, C. & Heo, C.Y. 2021. Asset-light strategies and stock market reactions to COVID-19's pandemic announcement: The case of hospitality firms. *Tourism Economics*.
- Rahman, M.L., Amin, A. & Al Mamun, M.A. 2021. The COVID-19 outbreak and stock market reactions: Evidence from Australia. *Finance Research Letters* 38: 101832.
- Shaffril, H.A.M., Krauss, S.E. & Samsuddin, S.F. 2018. A systematic review on Asian's farmers' adaptation practices towards climate change. *Science of the Total Environment* 644: 683–695.
- Sikarwar, E. 2021. Time-varying foreign currency risk of world tourism industry: effects of COVID-19. *Current Issues in Tourism* 24(7): 887–891.
- Tao, R., Su, C.W., Yaqoob, T. & Hammal, M. 2021. Do financial and non-financial stocks hedge against lockdown in Covid-19? An event study analysis. *Economic Research-Ekonomiska Istrazivanja* 0(0): 1–22.
- Umar Farooq, A.Q.J. 2017. Qualitative Research in Financial Markets Article information : Scope , Measurement , Impact Size and Determinants of Indirect cost of Financial

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