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Systematic Literature Review on Stock Market Return and Volatility during Covid-19

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Abstracts

The COVID-19 epidemic has created unprecedented disruptions in global financial markets, resulting in high volatility and large changes in stock returns. Understanding stock market behavior during crises is critical for academic research and practical financial decision-making. This research undertakes a systematic literature review (SLR) of empirical studies that investigate the impact of the COVID-19 pandemic on stock market return and volatility. By analyzing fifteen peer-reviewed articles published between 2019 and 2024, the review highlights how the pandemic triggered unprecedented financial market disruptions, characterized by increased volatility and sharp declines in stock returns across both developed and emerging markets. The findings reveal significant heterogeneity in the effects across countries, sectors, and index types, shaped largely by differing policy responses, pandemic severity, and investor behavior. Future research should aim to bridge these identified gaps. By focusing on Malaysia as a case study and incorporating clearly defined stock indices, precise sample periods, rigorous econometric methods, and thoughtfully chosen control variables, scholars can derive meaningful insights. This insight would not only enhance scholarly discourse, but would also provide useful insights for risk management, demonstrating how developing markets respond to global shocks and providing policymakers and investors with the solutions they need to handle future crises more successfully.

Keywords: Covid-19, Stock Market Return, Volatility

Introduction

An outbreak of unknown pneumonia occurred in late December 2019 at the Huanan Seafood Wholesale Market in Wuhan, China. It began with symptoms such as fever, dry cough, and exhaustion, impacting approximately 66% of the market's workforce. Following an epidemiologic alert, the market closed on January 1, 2020. However, the epidemic quickly spread in China, impacting many provinces and cities in January, and quickly crossed borders, reaching Thailand, Japan, the United States, and other nations (Elengoe, 2020). This illness is known as COVID-19. The outbreak of the COVID-19 pandemic in late 2019 and its rapid escalation into a global health emergency in early 2020 caused unprecedented disruption across social, economic, and financial systems worldwide (Zhang et al., 2020).

Because of the COVID-19 outbreak, every country has taken precautions to close their businesses and markets, and people are being forced to stay at home. Employment has suffered, increasing the unemployment rate; industrial production has begun to decrease precipitously, affecting the economic growth of emerging and developed countries; and tourism and travel sales have been severely reduced (Silva, 2022). Furthermore, stock markets worldwide have seen a reduction in market prices and increased uncertainty (Ashraf, 2020). The uncertainty over the scale and duration of the pandemic, combined with widespread lockdowns and halted economic activity, significantly impacted investor confidence. This, in turn, led to sharp declines in stock market returns and heightened volatility, marking one of the most turbulent periods in modern financial history (Baker et al., 2020).

In times of crisis, understanding stock market return and volatility is essential, not only for theoretical advancements in financial economics but also for practical decision-making in risk management, portfolio allocation, and policy intervention. However, despite the growing number of studies on COVID-19 and financial markets, the research problem remains that there is still limited clarity on how stock market returns and volatility behave consistently during crisis periods, as existing findings are often fragmented across countries, sectors, and methodologies (Bhowmik & Wang, 2020; Harjoto et al., 2021). This lack of a unified understanding highlights the importance and significance of further investigation.

Stock market returns are a fundamental indicator of investor sentiment and economic performance. They represent the gain or loss generated on an investment in equities over a specific period and are influenced by a wide array of macroeconomic, political, and psychological factors. During the COVID-19 pandemic, many major global indices—including the S&P 500, FTSE 100, and Nikkei 225—experienced extreme fluctuations, characterized by sudden crashes followed by periods of sharp recovery. The financial panic that unfolded in early 2020 caused one of the fastest bear markets in history, with the S&P 500 falling over 30% in less than a month (Baker et al., 2020). These movements reflected both the economic fallout of the pandemic and the emotional reactions of investors operating under high uncertainty, raising questions about market efficiency during crisis periods (Onali, 2020).

Volatility, defined as the degree of variation in the trading prices of financial instruments, surged to unprecedented levels during the early stages of the pandemic. The CBOE Volatility Index (VIX), often referred to as the “fear gauge,” reached levels not seen since the 2008 global financial crisis (Zhang et al., 2020). Unlike previous crises, however, the source of uncertainty in 2020 was not rooted in financial systems but in health-related and policy-driven developments. As a result, volatility was more reactive to non-financial variables such as infection rates, vaccine announcements, government lockdowns, and fiscal stimulus measures. Empirical studies during this period confirmed that financial markets were extremely sensitive to both pandemic-related news and government interventions (Al-Awadhi et al., 2020; Zaremba et al., 2021), highlighting the important role of policy actions in influencing market behaviour.

Furthermore, stock market behavior during COVID-19 showed heterogeneity across sectors and regions. Industries such as tourism, hospitality, and energy experienced severe downturns due to mobility restrictions and decreased demand, while sectors like technology

and healthcare showed relative resilience or even positive growth (Mazur et al., 2021). Regionally, developed markets with robust healthcare systems and proactive policy measures rebounded more quickly compared to emerging markets that faced structural vulnerabilities and limited fiscal capacity. These variations underline the importance of contextual factors in shaping financial market dynamics during global crises.

Therefore, a literature review is essential before beginning a research project; if well guided, it might offer ideas and directions for a new study. At the time of COVID-19, a literature review serves as a foundation for knowledge advancement and helps investors to plan and practice. This systematic literature review discusses the findings of how COVID-19 affects stock market return and volatility. As a result, this review study is organized as follows. The next section presents the research method of the systematic literature review (SLR). This is followed by a discussion of the results. Finally, the review concludes and provides future research suggestions.

Methodology

Systematic Literature Reviews (SLR) differ from traditional narrative reviews, employing replicable, scientific, and transparent producers. It assists in gathering all relevant publications and materials that fulfill our set inclusion criteria to answer a certain research question (Mengist et al., 2020). The systematic literature review in this study focuses on the impact of stock market return and volatility during COVID-19. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method is used to select relevant publications for this investigation, which ensures enhanced reporting.

Eligibility and Exclusion Criteria

Prior to picking the articles, we established the qualifying criteria. We have inclusion and exclusion criteria for our eligibility. Only articles that satisfy the inclusion criteria are considered. Articles that either fulfill the inclusion criteria or the exclusion criteria will not be included.

Table 1 lists the eligibility and exclusion criteria used in selecting publications for this review study. To assure the quality of this review, it solely considered published research articles. In addition, only journal papers are considered; books, book series, book chapters, conference articles, and dissertations are not. Furthermore, because English is the most widely used global language, this review focused on English-language research articles.

Table 1
The inclusion and exclusion criteria

Criteria	Eligibility	Exclusion
Publication stage	Final	Article in press
Source Type	Journal	books, book series, book chapters, conference articles, and dissertations
Language	English	Chinese, Spanish, French

Published Year	2019 until 2024	<2019
Title and Abstract	Related to COVID-19 and stock market return and volatility	Not Related to COVID-19 and stock market return and volatility

This review selected the three largest online databases, namely ScienceDirect, Scopus, and Emerald Insight. Articles with headlines and abstracts emphasizing the stock market's return and volatility during COVID-19, as well as anything else related to the research's focus, were also included in the study. We decided to include only articles that were published from 2019 to 2024 in the research which corresponds to the occurrence of Covid-19. Figure 1 depicts the processes of identification, screening, eligibility evaluation, and journal inclusion in our systematic literature review.

Searching Process

In order to search the related research literature, the review selected the three largest online databases, namely ScienceDirect, Scopus and Emerald Insight. Articles with headlines and abstracts emphasizing the stock market's return and volatility during COVID-19, as well as anything else related to the research's focus, were also included in the study.

For the type of source, we excluded all the articles in the press while for the document types, we excluded books, book series, book chapters, conferences articles and dissertations. Moreover, all selected articles are English-language publications and have been published. All the published articles are between 2019 to 2024 which only covers 6 years. All selection processes are designed to ensure the papers selected are high quality.

Article Selection

A Microsoft Excel spreadsheet that includes the title, keywords, abstract, author's name and affiliations, journal title, and year of publication was made in order to extract the detected data (Pahlevan-Sharif, Mura, and Wijesinghe, 2019). By examining the abstracts and titles of the papers in accordance with the eligibility requirements, the records were filtered. After removing the articles that didn't fit the inclusion requirements, a second selection process was carried out, and the complete texts were thoroughly examined. The entire text of all the chosen articles is accessible. The final chosen article is analyzed using a customized version of the Microsoft Excel spreadsheet.

Selection Process

A flowchart was created to illustrate the articles selection process. Our flowchart showed the number of articles included and excluded at each stage. This study’s selection process is summarized in Figure 1. There were 633 studies identified from ScienceDirect, Scopus, and Emerald Insight based on keywords searches. The results were reduced to 75 after excluding publication stage, source type, document type, language, title and abstract. Next, based on the eligibility criteria, the articles title and abstract were screened, and this stage had eliminated 60 papers which excluded due to unrelated to stock market return and volatility during covid-19. Our final analysis included a total of 15 papers in this study for further analysis that fully fulfilled the pre-defined inclusion criteria.

Results

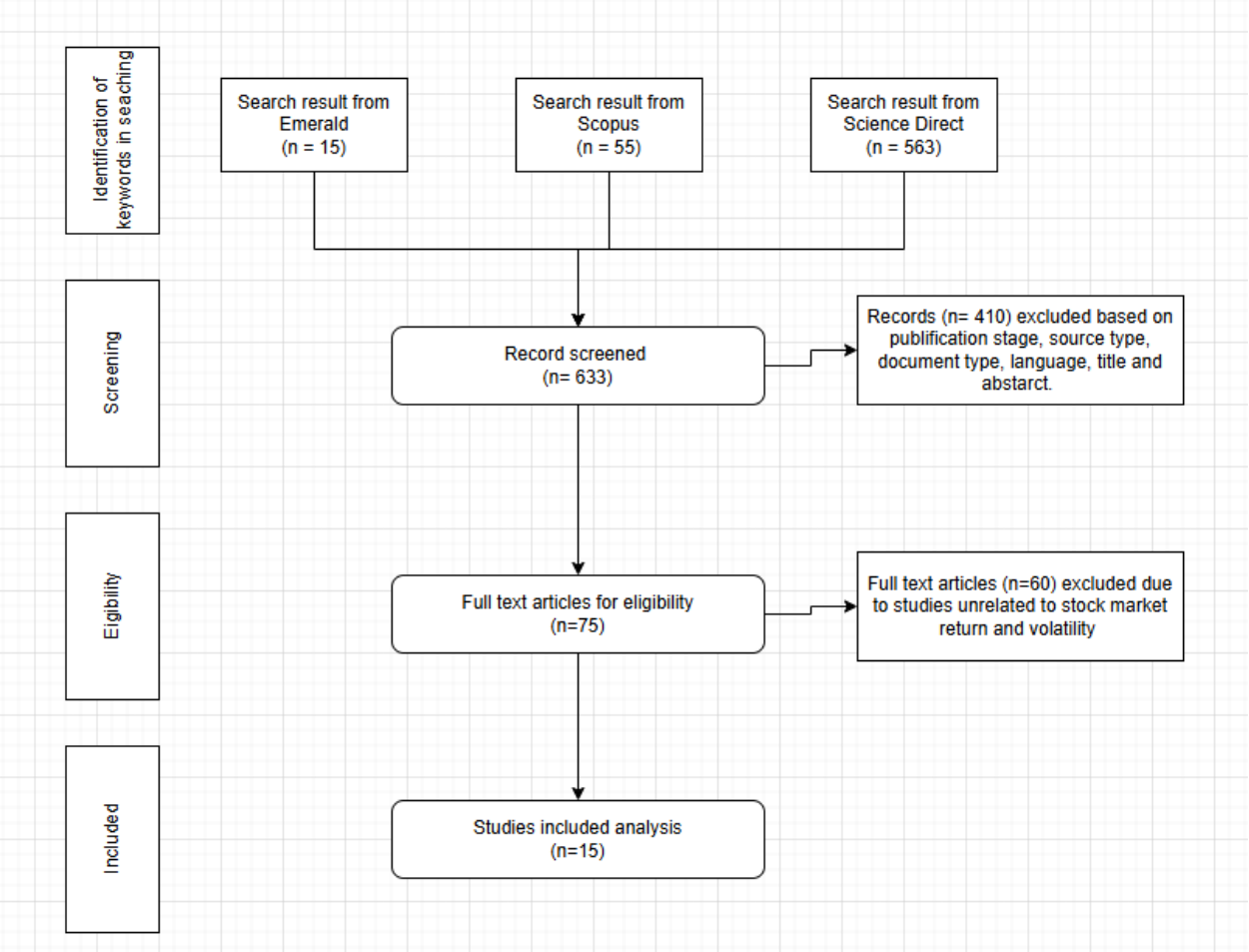

Figure 1 Presents the list of the journals considered for this systematic literature review.

Table 2
List of journals examined

No.	Name of Journal	No. of Papers	(%) of Papers
1.	Journal of Economic and Management Studies	1	6.67
2.	Journal of Islamic Accounting and Business Research	1	6.67
3.	Journal of Chinese Economic and Foreign Trade Studies	1	6.67
4.	Research in International Business and Finance	1	6.67
5.	Journal of Economics and Business	1	6.67
6.	Journal of Economic Integration	1	6.67
7.	The North American Journal of Economics and Finance	1	6.67
8.	Financial Innovation	1	6.67
9.	Cogent Business & Management	1	6.67
10.	Energy Economics	1	6.67
11.	Journal of International Financial Markets, Institutions & Money	2	13.33
12.	Heliyon	3	20.00
Total		**15**	**100**

Table 3
Literature studies: Does the research include Malaysia?

No.	Author(s) / Year	Included Malaysia	Not Included Malaysia
1	Kanamura, 2023		✓
2	Kusumahadi & Permana, 2021		✓
3	Nguyen et al., 2022		✓
4	Abouelfarag & Qutb, 2022		✓
5	Akinlaso et al., 2021		✓
6	Chow & Tan, 2022	✓	
7	Dharani et al., 2022		✓
8	Harjoto et al., 2021	✓	
9	Li et al., 2021		✓

10	Sharif et al. (2024)		✓
11	Kazouz & Benammou (2024)		✓
12	Ullah et al. (2023)	✓	
13	Farooque et al. (2023)	✓	
14	Khan et al. (2023)	✓	
15	Kayani et al. (2024)		✓

A key geographical gap identified in this systematic literature review on stock market return and volatility during COVID-19 is the limited inclusion of Malaysia as a primary study market. Out of the fifteen reviewed studies, only a few explicitly examined Malaysia or incorporated it meaningfully into their empirical frameworks. Chow and Tan (2022) directly analysed the Malaysian stock market by evaluating the impact of COVID-19 and government interventions across Bursa Malaysia sectors, offering valuable insights into sectoral return and volatility dynamics during the Movement Control Orders (MCOs). Similarly, Harjoto et al. (2021) included Malaysia within a broader cross-country analysis that explored the influence of government responses on stock market behaviour in both emerging and developed economies. In addition, some global or multi-country studies, such as Dharani et al. (2022), Ullah et al. (2023), Farooque et al. (2023), and Khan et al. (2023), implicitly included Malaysia as part of their emerging or global market samples, although the country was not treated as an independent case for in-depth analysis.

Conversely, the majority of studies—Kanamura (2023) on Japan and the United States, Kusumahadi and Permana (2021) on Indonesia, Nguyen et al. (2022) on Vietnam, Abouelfarag and Qutb (2022) on Egypt, and Akinlaso et al. (2021) on Tunisia—were country-specific and excluded Malaysia. Similarly, Li et al. (2021) focused on G20 stock markets, thereby omitting Malaysia due to its non-G20 status, while Sharif et al. (2024), Kazouz and Benammou (2024), and Kayani et al. (2024) concentrated on developed or U.S.-based markets, further excluding Malaysia from their scope.

This limited representation underscores a significant geographical research gap in the current body of literature. Despite Malaysia's position as a leading emerging market in Southeast Asia with a relatively active stock exchange and unique policy responses to the pandemic, particularly through the MCOs, its market behaviour during COVID-19 has not been sufficiently examined. Addressing this gap is essential for developing a more comprehensive understanding of how emerging Asian economies responded to pandemic-induced shocks in stock return and volatility. Future research should therefore prioritise Malaysia-focused or comparative regional analyses to strengthen empirical insights within this field.

Table 4
Literature studies: Main Index or Sectoral Index or Individual Index

No.	Author(s) / Year	Main Index	Sectoral Index	Individual Index
1	Kanamura, 2023			✓
2	Kusumahadi & Permana, 2021	✓		
3	Nguyen et al., 2022		✓	
4	Abouelfarag & Qutb, 2022	✓		
5	Akinlaso et al., 2021	✓		
6	Chow & Tan, 2022		✓	
7	Dharani et al., 2022		✓	
8	Harjoto et al., 2021	✓		
9	Li et al., 2021	✓		
10	Sharif et al. (2024)	✓		
11	Kazouz & Benammou (2024)	✓	✓	
12	Ullah et al. (2023)	✓		
13	Farooque et al. (2023)	✓		
14	Khan et al. (2023)	✓		
15	Kayani et al. (2024)	✓		

Another critical gap identified in this systematic literature review on stock market return and volatility during COVID-19 concerns the type of index analysed—whether main (composite), sectoral, or firm-level indices were used. Most of the reviewed studies primarily relied on broad market indices to assess the pandemic's overall impact on return and volatility. For instance, Kusumahadi and Permana (2021) examined aggregate volatility patterns across global and Indonesian stock markets, while Li et al. (2021) and Harjoto et al. (2021) analysed cross-country market reactions using national benchmark indices representing both developed and emerging economies. Similarly, Kanamura (2023) investigated hospitality-focused main indices in Japan and the United States, while Sharif et al. (2024) employed composite indices to evaluate volatility transmission and uncertainty in U.S. energy markets. These studies provide valuable macro-level perspectives but often overlook sector-specific or firm-level nuances.

A smaller body of research adopted a sectoral perspective, offering more granular insights into differential pandemic effects across industries. Chow and Tan (2022) conducted a sector-based analysis of Bursa Malaysia, revealing that government interventions and Movement Control Orders (MCO) triggered varying levels of volatility across Malaysian

sectors. Nguyen et al. (2022) produced similar findings for Vietnam, identifying the most vulnerable industries during pandemic phases. Dharani et al. (2022) examined sectoral movements across faith-based and conventional indices globally, while Abouelfarag and Qutb (2022) analysed sector-level responses in the Egyptian market. Studies such as Kazouz and Benammou (2024) further extended this approach by assessing volatility spillovers between stock and commodity sectors during epidemic crises. Although these sectoral analyses enrich the literature, they remain relatively limited compared to main index studies.

Even fewer studies explored firm-level volatility behaviour, often restricted to specific industries or thematic contexts. Kanamura (2023) assessed hospitality and hotel firms, whereas Akinlaso et al. (2021) and Dharani et al. (2022) examined firm dynamics within faith-based and Islamic finance markets. Similarly, Ullah et al. (2023) employed firm-level quantile regression analysis to capture heterogeneous volatility responses, and Farooque et al. (2023) investigated stock liquidity changes across individual firms in developed and emerging markets. Khan et al. (2023) and Kayani et al. (2024) also contributed firm-level evidence using GARCH-based models, revealing how specific market segments adjusted under pandemic pressure.

The dominance of composite index studies, as seen in Li et al. (2021), Harjoto et al. (2021), and Kusumahadi and Permana (2021), contrasts with the underrepresentation of sectoral and firm-level analyses such as those by Chow and Tan (2022), Nguyen et al. (2022), and Ullah et al. (2023). This imbalance creates a significant index-type research gap, as aggregated indices may obscure the heterogeneity of market responses across industries and individual firms. Future research should therefore employ a multi-layered index framework—integrating main, sectoral, and firm-level perspectives—to better capture the multidimensional nature of return and volatility transmission during pandemic-induced crises. Such an approach would provide richer empirical insights into how shocks propagate across different levels of financial systems and improve the robustness of policy and investment strategies in emerging markets such as Malaysia.

Table 5
Literature studies: Sample Period

No.	Author(s) / Year	Before	During	After
1	Kanamura, 2023		✓	✓
2	Kusumahadi & Permana, 2021		✓	
3	Nguyen et al., 2022		✓	
4	Abouelfarag & Qutb, 2022	✓	✓	
5	Akinlaso et al., 2021	✓	✓	
6	Chow & Tan, 2022		✓	
7	Dharani et al., 2022	✓	✓	

8	Harjoto et al., 2021	✓	✓	
9	Li et al., 2021	✓	✓	
10	Sharif et al. (2024)		✓	✓
11	Kazouz & Benammou (2024)		✓	✓
12	Ullah et al. (2023)		✓	✓
13	Farooque et al. (2023)		✓	✓
14	Khan et al. (2023)		✓	✓
15	Kayani et al. (2024)		✓	✓

An additional gap identified in this systematic literature review on stock market return and volatility during COVID-19 relates to the sample periods employed across the reviewed studies. The selected literature reveals that empirical coverage varied substantially, with studies generally falling into three temporal categories: before, during, and after the COVID-19 pandemic. This inconsistency in timeframes has implications for the comparability of findings and the interpretation of volatility persistence and market recovery dynamics.

Before the pandemic, only a few studies incorporated pre-crisis data to establish baseline conditions for stock market return and volatility. For instance, Li et al. (2021), Harjoto et al. (2021), Akinlaso et al. (2021), and Abouelfarag and Qutb (2022) included brief pre-pandemic windows—mostly from late 2018 to 2019—to compare normal market behaviour with crisis-induced dynamics. However, these pre-COVID periods were relatively short, limiting the ability to capture the true baseline volatility structure or long-term return trends prior to the global disruption. As a result, it becomes difficult to determine whether heightened volatility during the pandemic was a sharp deviation or a continuation of pre-existing instability.

During the pandemic, the majority of the reviewed studies focused on the core crisis period of 2020–2021, when stock markets worldwide experienced unprecedented volatility and sharp declines in returns. Studies such as Kusumahadi and Permana (2021), Nguyen et al. (2022), Chow and Tan (2022), and Dharani et al. (2022) concentrated on short-term volatility spikes and immediate investor reactions to pandemic uncertainty, government lockdowns, and policy responses. Similarly, Kanamura (2023) and Abouelfarag and Qutb (2022) observed intensified volatility clustering across sectors, particularly in industries such as energy, tourism, and finance. While these studies captured the height of market turbulence, most lacked analysis of how return and volatility adjusted once the initial shock subsided, leaving a gap in understanding volatility persistence and post-shock stabilization.

After the pandemic, several recent studies expanded their sample coverage to include post-crisis recovery periods, providing insights into how stock markets gradually stabilized and returns recovered. For example, Ullah et al. (2023), Farooque et al. (2023), and Khan et al. (2023) extended their analysis through 2022, identifying signs of volatility normalization and return correction as global economies reopened. Meanwhile, Sharif et al. (2024), Kazouz

and Benammou (2024), and Kayani et al. (2024) further broadened their scope to 2023, investigating long-term volatility transmission and cross-market spillovers in the post-pandemic phase. However, only a few studies—such as Sharif et al. (2024) and Kayani et al. (2024)—included all three phases (pre-, during-, and post-pandemic) within a unified framework to assess the complete volatility and return cycle.

Overall, the evidence from Table 5 highlights a temporal coverage gap in the literature on stock market return and volatility during COVID-19. Most studies concentrated primarily on the immediate crisis period, overlooking how return patterns and volatility evolved before and after the pandemic. This limited temporal focus provides only a partial understanding of the full market cycle, including the onset, escalation, and recovery of volatility shocks. Future research should employ extended and comparative sample periods encompassing all three phases to capture the complete behavioural dynamics of stock returns and volatility, particularly in emerging markets such as Malaysia, where policy interventions and structural factors may have influenced the pace and magnitude of recovery.

Table 6
Literature studies: Method

No.	Author(s) / Year	GARCH	OTHERS
1	Kanamura, 2023		✓
2	Kusumahadi & Permana, 2021	✓	
3	Nguyen et al., 2022		✓
4	Abouelfarag & Qutb, 2022	✓	
5	Akinlaso et al., 2021	✓	
6	Chow & Tan, 2022	✓	
7	Dharani et al., 2022		✓
8	Harjoto et al., 2021		✓
9	Li et al., 2021		✓
10	Sharif et al. (2024)		✓
11	Kazouz & Benammou (2024)	✓	
12	Ullah et al. (2023)		✓
13	Farooque et al. (2023)		✓
14	Khan et al. (2023)	✓	
15	Kayani et al. (2024)		✓

A significant methodological gap identified in this Systematic Literature Review on Stock Market Return and Volatility during COVID-19 concerns the inconsistent and often limited application of GARCH-based models in the reviewed literature. Although the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) framework and its variants—such as EGARCH, TGARCH, DCC-GARCH, and GJR-GARCH—have been widely recognized for their ability to model time-varying volatility, asymmetric responses to shocks, and volatility spillovers across markets, their usage remains relatively sparse among the fifteen reviewed studies. Only a few studies, including Kusumahadi and Permana (2021), Abouelfarag and Qutb (2022), Akinlaso et al. (2021), Kazouz and Benammou (2024), Chow and Tan (2022), and Khan et al. (2023), employed GARCH-type models to analyse the persistence and clustering of volatility during the COVID-19 crisis. These studies demonstrated that GARCH models are particularly useful in identifying volatility asymmetry, leverage effects, and contagion patterns—key features that became more pronounced during the pandemic's market disruptions.

In contrast, a majority of the more recent studies—such as Kanamura (2023), Nguyen et al. (2022), Dharani et al. (2022), Sharif et al. (2024) and Ullah et al. (2023)—relied on alternative econometric techniques, including VAR models, wavelet coherence analysis, panel regressions, and copula approaches. While these methods provide valuable insights into short-term interdependencies and spillovers across global and sectoral markets, they are less suited to capturing the evolving nature of volatility persistence and asymmetric shock transmission that GARCH models are designed to handle. The growing reliance on non-GARCH frameworks therefore signals a methodological shift towards broader market relationship analyses but simultaneously creates a gap in volatility-specific modelling precision.

This imbalance indicates that the literature has yet to fully exploit the analytical strength of GARCH models in describing volatility behaviour during and after the COVID-19 crisis. Given that financial markets in emerging economies such as Malaysia are often more sensitive to global shocks, liquidity constraints, and policy interventions, future research should re-emphasize and expand the application of GARCH-type models.

Table 7
Literature studies: Control Variables

No.	Author(s) / Year	YES	NO
1	Kanamura, 2023	✓	
2	Kusumahadi & Permana, 2021		✓
3	Nguyen et al., 2022		✓
4	Abouelfarag & Qutb, 2022	✓	
5	Akinlaso et al., 2021		✓
6	Chow & Tan, 2022	✓	
7	Dharani et al., 2022		✓

8	Harjoto et al., 2021		✓
9	Li et al., 2021		✓
10	Sharif et al. (2024)	✓	
11	Kazouz & Benammou (2024)	✓	
12	Ullah et al. (2023)		
13	Farooque et al. (2023)	✓	
14	Khan et al. (2023)		✓
15	Kayani et al. (2024)	✓	

Another important methodological limitation identified in this systematic literature review on stock market return and volatility during COVID-19 pertains to the use and treatment of control variables. Control variables are vital for distinguishing the specific effects of the pandemic from other external macroeconomic and financial influences on stock market return and volatility. However, the findings reveal that fewer than half of the studies incorporated appropriate control factors, resulting in potential model bias and limited explanatory power.

Studies such as Kanamura (2023), Abouelfarag and Qutb (2022), Chow and Tan (2022), Sharif et al. (2024), Kazouz and Benammou (2024), Ullah et al. (2023), Farooque et al. (2023), and Kayani et al. (2024) demonstrated better model robustness by integrating macroeconomic and financial variables such as oil prices, interest rates, exchange rates, and policy indices. These studies provided a more holistic understanding of how external forces interacted with COVID-19 shocks to shape volatility dynamics and stock performance.

In contrast, studies such as Kusumahadi and Permana (2021), Nguyen et al. (2022), Akinlaso et al. (2021), Dharani et al. (2022), Harjoto et al. (2021), Li et al. (2021), and Khan et al. (2023) did not include any control variables, relying solely on primary market indicators or OVID-19 case data. The absence of such controls limits the ability to disentangle pandemic-specific shocks from general market conditions or concurrent macroeconomic events, potentially leading to overstated volatility responses.

This inconsistency reveals a clear research gap regarding the integration of control variables in volatility modelling during the pandemic. Future research should place stronger emphasis on the inclusion of comprehensive and globally recognized control indicators, particularly the Volatility Index (VIX) — a well-established measure of market risk sentiment and uncertainty. Incorporating the VIX as a control variable would allow researchers to better capture global investor fear and uncertainty, offering a more accurate assessment of how pandemic-induced stress influenced both developed and emerging stock markets. For Malaysia, where external risk transmission plays a critical role, the inclusion of the VIX could provide meaningful insights into how global market sentiment shaped domestic return and volatility behaviour throughout and after the COVID-19 crisis.

Discussion

Financial markets were severely impacted by the extraordinary worldwide catastrophe caused by the COVID-19 pandemic. There is general agreement among the fifteen selected studies that the pandemic led to sharp declines in stock market returns and unprecedented spikes in volatility, particularly during the first quarter of 2020. The majority of markets experienced significant losses as investor confidence was shaken by uncertainties surrounding the virus's spread, the duration of lockdowns, and government intervention measures. For instance, Kanamura (2023) reported that travel bans and social distancing policies had immediate and severe effects on Japan's hospitality and travel sectors, while Nguyen et al. (2022) found that service-based firms in Vietnam were among the most negatively impacted, even as healthcare and utilities demonstrated relative resilience. Similarly, Sharif et al. (2024) revealed that pandemic-related uncertainty significantly intensified volatility in U.S. energy markets, confirming the sensitivity of energy prices to global shocks and health crises.

Important differences and nuanced trends emerged across regions, industries, and methodological approaches. Chow and Tan (2022) and Kusumahadi and Permana (2021) documented substantial declines in Malaysian and ASEAN markets, reflecting the heightened vulnerability of emerging economies. In contrast, Abouelfarag and Qutb (2022) found that Egypt's EGX30 experienced relatively moderate declines, possibly due to lower global integration. Similarly, Li et al. (2021) observed that China's swift and aggressive containment measures accelerated recovery, highlighting the crucial role of timely government intervention. Kayani et al. (2024) extended this insight to developed economies, showing that those with proactive fiscal responses and vaccination rollouts exhibited faster volatility normalization. These disparities suggest that institutional capacity, fiscal space, and public health responses played key roles in shaping investor sentiment and volatility dynamics across markets.

Volatility was a recurring and central theme throughout the reviewed literature. Most studies employed GARCH-type models (e.g., EGARCH, GJR-GARCH, DCC-GARCH) to measure time-varying volatility and volatility spillovers. Khan et al. (2023) used GARCH models to demonstrate significant increases in volatility persistence across global equity markets during the pandemic period. Dharani et al. (2022) confirmed that BRICS markets displayed volatility clustering that aligned closely with COVID-19 outbreak waves and policy announcements. Meanwhile, Kazouz and Benammou (2024) applied a time-varying correlation framework to show intensified co-movements between stock and commodity markets during the epidemic crisis era—implying that contagion risk heightened even across asset classes traditionally considered diversifiers. These results underscore the systemic nature of the pandemic's financial impact.

However, methodological robustness varied substantially across studies. Those that integrated control variables—such as interest rates, oil prices, or policy uncertainty indexes—tended to yield more reliable conclusions. For instance, Sharif et al. (2024) and Abouelfarag and Qutb (2022) explicitly accounted for macroeconomic controls, thereby isolating COVID-19-specific effects. In contrast, Nguyen et al. (2022) and Dharani et al. (2022) relied primarily on pandemic indicators (case counts, lockdown duration), limiting their ability to separate pandemic-driven volatility from broader economic instability. Future research can improve

reliability by introducing global uncertainty measures like the VIX—a key volatility proxy that several recent studies (e.g., Ullah et al., 2023) have identified as a significant determinant of financial market stress.

Volatility transmission and interdependence intensified notably during the pandemic. Akinlaso et al. (2021) found that Islamic and conventional indices in Tunisia, typically segmented, became highly correlated under crisis conditions. Farooque et al. (2023) added cross-country evidence, showing that stock liquidity deteriorated in both developed and emerging markets, especially where Economic Policy Uncertainty (EPU) was high. These findings highlight that volatility and liquidity risks interacted closely during crisis episodes, amplifying systemic fragility. Furthermore, structural break analyses by Abouelfarag and Qutb (2022) and Li et al. (2021) revealed that volatility regimes transitioned distinctly before, during, and after major pandemic waves—indicating that investors adapted their behavior as policy measures evolved and economic conditions stabilized.

Sectoral differences were equally striking. Technology and healthcare sectors generally benefited from increased demand and investor optimism, while tourism, energy, and transportation sectors suffered prolonged downturns. Sharif et al. (2024) emphasized that oil and gas markets faced exceptional volatility, driven by collapsing demand and shifting investor expectations. Similarly, Kayani et al. (2024) and Khan et al. (2023) found that developed markets rebounded more swiftly due to larger fiscal interventions and coordinated central bank responses, whereas emerging markets struggled with prolonged instability due to constrained policy space and weaker health infrastructure. These sectoral asymmetries suggest that policy coordination, not just economic scale, determined resilience.

Overall, these studies provide robust evidence that COVID-19 significantly reduced stock returns and heightened market volatility, but they also reveal critical gaps and variations. Methodological approaches that include broader control variables and robustness tests yield more reliable insights, whereas studies relying solely on pandemic data may overstate or misattribute volatility effects. To better synthesize these findings, a visual comparison matrix highlighting geography (developed vs. emerging markets), sectoral exposure (vulnerable vs. resilient industries), and methodological choices (use of control variables, robustness checks) would clearly show where results converge and where contradictions remain.

In conclusion, the pandemic's impact on financial markets was heterogeneous, shaped by differences in market structure, sector composition, government response, and research methodology. These observations underscore the importance of applying standardized methods, incorporating control variables, and examining multiple time horizons to generate results that are both academically rigorous and directly relevant for policymakers and investors preparing for future global crises.

Table 8
Summary of findings

Reference	Model	Country / Sector	Frequency	Period	Aspect	Findings
Kanamura, 2023	Regime-switching volatility	Japan / US	Daily	January 2, 2019, to September 10, 2021,	Return Volatility	COVID-19 pandemic had a significant negative impact on hotel stock returns in both Japan and the United States, with the most severe effects occurring during the early stages of the outbreak. The study reveals that U.S. hotel stocks experienced sharper declines but recovered more quickly due to swift government stimulus efforts, while Japanese stocks showed a more gradual and persistent response. The research highlights the hotel sector's vulnerability to pandemic shocks and underscores the critical role of national policy responses in influencing stock market behavior.
Kusumahadi & Permana, 2021	GARCH	15 Countries	Daily	January 1, 2019, to June 30, 2020	Return Volatility	The study finds that the pandemic significantly increased volatility in all observed markets, particularly during the early months of the outbreak. Emerging markets experienced more intense volatility compared to developed markets, reflecting differing levels of market resilience and government responses.
Nguyen et al., 2022	CAR	Vietnam (13 industries)	Daily	15 April 2019 to 15 November 2021.	Return Volatility	The study finds that the pandemic led to significant negative returns and increased volatility, but the effects varied widely across sectors. Industries such as healthcare, information technology, and consumer goods demonstrated resilience or even positive performance, while sectors like energy, real estate, and industrials experienced sharp declines.
Abouelfarag & Qutb, 2022	GARCH	Egypt	Daily	July 31, 2018 to June 30, 2021.	Return Volatility	Their findings show that the pandemic had a significant adverse impact on the market, leading to declines in returns and heightened volatility, particularly during the early stages of the outbreak. The study highlights that different sectors reacted unevenly, with tourism and services being the most negatively affected due to lockdowns and travel restrictions.

Akinlaso et al., 2021	GARCH	Tunisia	Daily	17th May 2010 to 21st May 2020	Return Volatility	Their findings reveal that volatility significantly increased across financial markets due to pandemic-induced uncertainty. However, Islamic financial indices, particularly faith-based investments, demonstrated greater stability and lower volatility spillover compared to conventional counterparts. This suggests that Islamic financial principles—such as risk-sharing and ethical investment—may offer protective features during crises.
Chow & Tan, 2022	GARCH	Malaysia	Daily	January 29, 2020 to March 31, 2021	Return Volatility	Their findings show that the pandemic had a heterogeneous effect across different sectors. Sectors such as technology and healthcare experienced positive returns due to increased demand during the pandemic, while transportation, tourism, and energy sectors faced significant negative shocks.
Dharani et al., 2022	GARCH	Global	Daily	1st January 2020 to 29th October 2020	Return Volatility	The study reveals that Islamic indices, which avoid speculative and high-risk sectors, were less volatile and performed relatively better than conventional indices during the pandemic. This resilience was particularly noticeable in sectors such as healthcare and technology, which align with Shariah principles and benefited from pandemic-related demand shifts.
Harjoto et al., 2021	Multivariate regressions	Develop Country Emerging Country	Daily	January 14, 2020, to August 20, 2020.	Return Volatility	The study finds that stock markets across the globe responded negatively to the rising number of COVID-19 cases and deaths, with emerging markets experiencing greater volatility and larger declines in returns compared to developed markets. The research highlights the role of institutional quality and government interventions, showing that countries with more effective governance and faster policy responses experienced less severe market downturns.

Li et al., 2021	VAR	G20 Country	Daily	Sep 30, 2019, to Jun 11, 2020.	Return Volatility	The study finds that COVID-19 significantly increased market volatility and led to sharp declines in returns across most G20 stock markets, especially in the early stages of the outbreak. The authors identify that the intensity of the pandemic's impact varied across countries, influenced by factors such as health system readiness, government policy responses, and investor sentiment. Additionally, negative news about infection rates and deaths had a stronger effect on market performance compared to positive news like stimulus packages or recovery rates, emphasizing the asymmetric reaction of markets to pandemic-related information.
Sharif et al. (2024)	Quantile Regression	U.S. Energy Market	Daily	January 1, 2020 – December 31, 2022	Return Volatility	The study reveals that COVID-19-related uncertainties significantly increased volatility in the U.S. energy markets. The results indicate that oil and gas sector returns were highly sensitive to pandemic-induced shocks and policy announcements. Investor fear and uncertainty, reflected in volatility indices, were the main drivers behind fluctuations in energy market performance.
Kazouz & Benammou (2024)	GARCH	Global Stock and Commodity Markets	Daily	January 1, 2018 – December 31, 2022	Return Volatility	The authors found strong volatility spillovers between stock and commodity markets during the epidemic crisis period. Correlations were highly time-varying, intensifying during the COVID-19 outbreak. The study highlights that the crisis triggered interconnected market responses, with oil and gold playing major roles in transmitting volatility across global financial markets.
Ullah et al. (2023)	Quantile Regression	Global Financial Markets	Daily	January 1, 2020 – December 31, 2021	Return & Volatility	The study demonstrates that the pandemic significantly increased volatility across global financial markets, particularly during its early phase. The quantile regression results show asymmetric effects—markets experienced severe negative shocks during downturns, but positive recovery effects were weaker and short-lived. The results underline how pandemic-related

						uncertainty heightened risk perception among investors.
Farooque et al. (2023)	Panel Regression	Developed & Emerging Economies	Daily	January 1, 2020 – December 31, 2021	Return Volatility	The study finds that stock liquidity declined sharply during the COVID-19 crisis, with emerging markets suffering greater liquidity shocks than developed economies. The results indicate that high levels of economic policy uncertainty magnified these effects. Stronger institutional frameworks and proactive policy responses were associated with quicker liquidity recovery.
Khan et al. (2023)	GARCH	Global Stock Markets	Daily	January 1, 2020 – December 31, 2021	Return Volatility	The GARCH analysis shows that financial market volatility surged significantly following the onset of the pandemic. Developed markets exhibited faster volatility transmission and recovery, while emerging markets experienced prolonged turbulence. The study concludes that policy uncertainty and investor sentiment were critical in shaping volatility patterns during COVID-19.
Kayani et al. (2024)	Quantile Regression	Developed Economies	Daily	January 1, 2020 – December 31, 2022	Return Volatility	This study shows that the pandemic caused substantial volatility spikes in developed economies, though markets demonstrated varying resilience. The findings indicate that technology and healthcare sectors outperformed during the crisis, while energy and tourism sectors faced sharp declines. The paper highlights that government fiscal measures and vaccination rollouts contributed to faster recovery in stock performance.

Conclusion

This review of fifth teen empirical studies provides compelling evidence that the COVID-19 pandemic significantly disrupted global financial markets, leading to sharp declines in stock market returns and heightened volatility. The pandemic's economic uncertainty, abrupt policy shifts, and fluctuating investor sentiment triggered widespread market turbulence across both developed and emerging economies. These findings are consistent with recent empirical studies (e.g., Sharif et al., 2024; Kayani et al., 2024; Kazouz and Benammou, 2024), which similarly document heightened volatility, increased market co-movement, and structural breaks in financial behaviour during the pandemic period. At the same time, this review builds on and extends this literature by synthesising evidence across regions, sectors, and methodologies, highlighting that market reactions are more heterogeneous than some recent single-country studies suggest. Sectoral differences were evident, with industries such as hospitality and tourism suffering the greatest losses, while healthcare and technology demonstrated relative resilience. Methodologically, most studies employed econometric models such as GARCH and its variants to analyse volatility, and many confirmed that financial markets were highly sensitive to pandemic-related news and policy interventions.

Despite the valuable insights offered, several research gaps remain. This review identifies several notable research gaps that warrant further investigation.

First, while many studies concentrated on major economies like the U.S., China, and Japan, limited research focused specifically on Malaysia, despite its unique economic structure and Movement Control Order (MCO) policy framework during COVID-19. Recent studies on emerging markets (e.g., Chow and Tan, 2022; Kusumahadi and Permana, 2021) suggest stronger and more persistent volatility effects compared to developed markets; however, findings remain inconsistent, indicating a gap that this study contextually addresses by emphasizing Malaysia as a less-explored but structurally distinct case.

Moreover, the selection of main indices versus sectoral or individual-level data varies considerably across studies, creating challenges in drawing unified conclusions. Many analyses relied solely on main market indices, potentially masking sectoral or firm-level nuances. For instance, relying on indices like the KLCI or EGX30 might overlook how different industries within those indices behaved differently. Additionally, while sectoral index studies are gaining traction, there is still a lack of integration between the three levels of analysis—main index, sectoral index, and individual stocks—within a single framework. This review therefore builds on recent methodological developments that call for multi-level financial analysis, but also highlights that existing empirical work remains fragmented across these levels**.**

Other than that, future research should be structured around clearly defined pandemic phases—namely, the pre-pandemic period (before the first reported COVID-19 cases or lockdowns), the initial outbreak phase (when the pandemic began spreading globally), the height of government interventions (such as lockdowns, movement control orders, or stimulus measures), and the post-pandemic recovery period (when markets began stabilizing or rebounding). Additionally, studies should include appropriate control variables to isolate the specific effects of COVID-19.

A large share of research uses standard volatility models such as GARCH and its variants, but many studies lack robustness tests or comparative model specifications. Without verifying whether results hold across alternative econometric methods, subsamples, or structural break points, findings remain less conclusive. This limitation contrasts with more recent empirical approaches (e.g., Ullah et al., 2023), which emphasize robustness testing and model comparison to improve reliability in crisis-based financial studies. Future work should adopt rigorous multi-method approaches and perform systematic validation.

Several studies estimate COVID-19 effects using raw indicators like case counts or lockdown dates without adjusting for broader macroeconomic drivers such as oil prices, interest rates, or global risk sentiment. Omitting these factors makes it difficult to separate pandemic-specific shocks from general market forces. Consistently including well-chosen control variables would yield clearer and more reliable insights.

By incorporating these elements, future research can more accurately assess how the pandemic, as opposed to other external shocks, influenced stock market return and volatility. Emphasizing Malaysia as a case study—while employing clearly defined main indices, well-specified sample periods, robust econometric approaches, and carefully selected control variables—can generate valuable insights. Such research would contribute not only to empirical finance literature but also to ongoing social science debates on crisis behaviour, financial stability, and the limits of market efficiency under extreme global shocks. It would also provide practical implications for risk management by shedding light on how emerging markets react to global crises and how both policymakers and investors can better prepare for similar events in the future.

References

Abouelfarag, H. A., & Qutb, R. (2022). The Egyptian stock market's reaction to the COVID-19 pandemic. *African Journal of Economic and Management Studies, 13*(2), 251–267. https://doi.org/10.1108/AJEMS-10-2021-0461

Akerlof, G. A., & Shiller, R. J. (2009). *Animal spirits: How human psychology drives the economy, and why it matters for global capitalism*. Princeton University Press.

Akinlaso, M. I., Robbana, A., & Mohamed, N. (2021). Volatility transmission within financial markets during the COVID-19 pandemic: Are faith-based investors well off in Tunisia? *Journal of Islamic Accounting and Business Research, 13*(1), 98–113. https://doi.org/10.1108/JIABR-12-2020-0388

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. https://doi.org/10.1016/j.jbef.2020.100326

Aldhamari, R., Ku Ismail, K. N., Al-Sabri, H. M., & Saleh, M. S. (2022). Stock market reactions of Malaysian firms and industries towards events surrounding COVID-19 announcements and number of confirmed cases. *Pacific Accounting Review, 35*(3), 390–411. https://doi.org/10.1108/PAR-08-2020-0125

Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance, 54*, 101249. https://doi.org/10.1016/j.ribaf.2020.101249

Awalludin, S. A., Ulfah, S., & Soro, S. (2018). Modeling the stock price returns volatility using GARCH(1,1) in some Indonesia stock prices. *Journal of Physics: Conference Series, 948*, 012068. https://doi.org/10.1088/1742-6596/948/1/012068

Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives, 21*(2), 129–151.

Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). *COVID-induced economic uncertainty* (NBER Working Paper No. 26983). National Bureau of Economic Research.

Bhowmik, R., & Wang, S. (2020a). Stock market volatility and return analysis: A systematic literature review. *Entropy, 22*(5), 522. https://doi.org/10.3390/e22050522

Białkowski, J., Gottschalk, K., & Wisniewski, T. P. (2008). Stock market volatility around national elections. *Journal of Banking & Finance, 32*(9), 1941–1953.

Chow, Y. P., & Tan, Y. H. (2022). Impact of COVID-19 and government interventions on Bursa Malaysia sectors. *Journal of Chinese Economic and Foreign Trade Studies, 16*(2), 99–118. https://doi.org/10.1108/JCEFTS-06-2022-0039

Dharani, M., Hassan, M. K., Rabbani, M. R., & Huq, T. (2022). Does the COVID-19 pandemic affect faith-based investments? Evidence from global sectoral indices. *Research in International Business and Finance, 59*, 101537. https://doi.org/10.1016/j.ribaf.2021.101537

Elengoe, A. (2020). COVID-19 outbreak in Malaysia. *Osong Public Health and Research Perspectives, 11*(3), 93–100. https://doi.org/10.24171/j.phrp.2020.11.3.08

Farooque, O. A., Baghdadi, G., Trinh, H. H., & Khandaker, S. (2023). Stock liquidity during COVID-19 crisis: A cross-country analysis of developed and emerging economies, and economic policy uncertainty. *Emerging Markets Review, 55*, 101025. https://doi.org/10.1016/j.ememar.2023.101025

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. https://doi.org/10.1016/j.jeconbus.2020.105966

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*, 101671. https://doi.org/10.1016/j.irfa.2021.101671

Kanamura, T. (2023). An impact assessment of the COVID-19 pandemic on Japanese and US hotel stocks. *Financial Innovation, 9*(1). https://doi.org/10.1186/s40854-023-00478-2

Kayani, U. N., Aysan, A. F., Khan, M., & Khan, M. (2024). Unleashing the pandemic volatility: A glimpse into the stock market performance of developed economies during COVID-19. *Heliyon, 10*(2), e25202. https://doi.org/10.1016/j.heliyon.2024.e25202

Kazouz, H., & Benammou, S. (2024). Volatility spillovers and time-varying correlations across stock and commodity markets: An assessment during the epidemic crisis era. *Development and Sustainability in Economics and Finance, 2–4*, 100024. https://doi.org/10.1016/j.dsef.2024.100024

Khan, M., Kayani, U. N., Khan, M., Mughal, K. S., & Haseeb, M. (2023). COVID-19 pandemic and financial market volatility: Evidence from GARCH models. *Journal of Risk and Financial Management, 16*(1), 50. https://doi.org/10.3390/jrfm16010050

Kusumahadi, T. A., & Permana, F. C. (2021). Impact of COVID-19 on global stock market volatility. *Journal of Economic Integration, 36*(1), 20–45. https://doi.org/10.11130/jei.2021.36.1.20

Li, Y., Zhuang, X., Wang, J., & Dong, Z. (2021). Analysis of the impact of COVID-19 pandemic on G20 stock markets. *The North American Journal of Economics and Finance, 58*, 101530. https://doi.org/10.1016/j.najef.2021.101530

Mazur, M., Dang, M., & Vega, M. (2021). COVID-19 and the March 2020 stock market crash: Evidence from S&P1500. *Finance Research Letters, 38*, 101690.

Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX, 7*, 100777. https://doi.org/10.1016/j.mex.2019.100777

Mohamad, S., Hassan, T., & Ariff, M. (2007). Research in an emerging Malaysian capital market: A guide to future direction. *International Journal of Economics and Management, 1*(2), 173–202.

Nguyen, N. H., Vu, N. T., Tran, Q., Tran, T., & Vo, D. H. (2022). Market performance and volatility during the COVID-19 pandemic in Vietnam: A sector-based analysis. *Cogent Business & Management, 9*(1). https://doi.org/10.1080/23311975.2022.2119681

Onali, E. (2020). COVID-19 and stock market volatility. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3571453

Pahlevan-Sharif, S., Mura, P., & Wijesinghe, S. N. R. (2019). A systematic review of systematic reviews in tourism. *Journal of Hospitality and Tourism Management, 39*, 158–165. https://doi.org/10.1016/j.jhtm.2019.04.001

Sharif, T., Ghouli, J., Bouteska, A., & Abedin, M. (2024). The impact of COVID-19 uncertainties on energy market volatility: Evidence from the US markets. *Economic Analysis and Policy, 84*, 25–41. https://doi.org/10.1016/j.eap.2024.08.008

Silva, C. A. (2022b). Stock market volatility and the COVID-19 pandemic in emerging and developed countries: An application of the asymmetric exponential GARCH model. *European Journal of Business and Management Research, 7*(4), 71–81. https://doi.org/10.24018/ejbmr.2022.7.4.1492

Statman, M., Fisher, K. L., & Anginer, D. (2008). Affect in a behavioural asset-pricing model. *Financial Analysts Journal, 64*(2), 20–29.

Tay, Y. L., Abdullah, Z., Chelladorai, K., Low, L. L., & Tong, S. F. (2021). Perception of the movement control order during the COVID-19 pandemic: A qualitative study in Malaysia. *International Journal of Environmental Research and Public Health, 18*(16), 8778. https://doi.org/10.3390/ijerph18168778

Tuyon, J., Ahmad, Z., & Matahir, H. (2016). The role of investor sentiment in Malaysian stock market. *Asian Academy of Management Journal of Accounting and Finance, 12*(Suppl. 1), 43–75.

Ullah, S., Khan, M., Hashmi, N. I., & Alam, M. S. (2023). The COVID-19 pandemic and financial market volatility: A quantile regression approach. *Heliyon, 9*(10), e21131. https://doi.org/10.1016/j.heliyon.2023.e21131

Zaremba, A., Kizys, R., Aharon, D. Y., & Demir, E. (2021). Infected markets: Novel coronavirus, government interventions, and stock return volatility around the globe. *Finance Research Letters, 35*, 101597.

Zhang, D., Hu, M., & Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. *Finance Research Letters, 36*, 101528.